Asian Transplantation Week 2024

Challenges and Opportunities in Asian Transplantation

Nov. 14(Thu)~16(Sat), 2024

Conrad Seoul, Korea

Abstract Book

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Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Invited Lectures

Challenges and Opportunities in Asian Transplantation

Lecture Code : PG01-S2
Session Name : Postgraduate Course 1 (Liver)
Session Topic : Overall Review of Minimally Invasive Donor Hepatectomy
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 3F-1

Learning Curve of Laparoscopic & Robotic Donor Hepatectomy

Gi Hong Choi
Yonsei University College of Medicine, Republic of Korea

I'd like to first assess the learning curve of non-donor minimally invasive hepatectomy including comparison between laparoscopic and robotic hepatectomy before dealing with the today's topic. A recent systematic review and meta-regression analysis showed that the overall number of cases needed to surmount the learning curve for non-donor minimally invasive hepatectomy has been decreasing steadily over the years. This is attributed to the accumulation of knowledge and experience and technical advancements during the last two decades. Moreover, the number needed to surmount the curve appears to be greater for LLR than for RLR. There are several factors that may help explain this difference, including technical advantages, timing of the studies, and previous experience of surgeons with other minimally invasive techniques. Minimally invasive donor hepatectomy is one of the most challenging procedures and it has been recently established in expert centers. Most studies evaluated a learning curve of minimally invasive donor hepatectomy based on duration of surgery. Kikuchi et al. reported that a learning curve effect was demonstrated after the 34th laparoscopic donor hepatectomy. In case of laparoscopic donor right hepatectomy, Hong et al demonstrated that a stable learning curve of approximately 60 cases of procedure. As for robotic donor hepatectomy, recent studies reported a learning curve was observed in 16th and 17th case in left lateral and right donor hepatectomy, respectively. Robotic donor hepatectomy seems to provide shorter learning curve than laparoscopic donor hepatectomy, but more studies are required. In addition, most studies on learning curve have been reported by pioneer surgeons. More studies are needed for the second generation learning curve.

Keywords: Learning curve, laparoscopic hepatectomy, Robotic hepatectomy, Donor hepatectomy, outcomes

Lecture Code : PG01-S3
Session Name : Postgraduate Course 1 (Liver)
Session Topic : Overall Review of Minimally Invasive Donor Hepatectomy
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 3F-1

Tools for Liver Anatomy in MIS Donor Hepatectomy - 3D Reconstruction & ICG

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Minimally invasive surgery (MIS) for living donor liver transplantation (LDLT) has seen significant advancements over recent years, with an increasing focus on maximizing donor safety while achieving optimal outcomes for recipients. In this context, precise anatomical understanding and enhanced visualization techniques have become critical for performing complex donor hepatectomies. Among the most promising tools to improve liver anatomy visualization in MIS donor hepatectomy are 3D reconstruction and indocyanine green (ICG) fluorescence imaging. This abstract discusses the integration of these technologies and their impact on surgical outcomes and safety. 3D Reconstruction: A Preoperative and Intraoperative Guide Three-dimensional (3D) reconstruction technology has revolutionized preoperative planning for donor hepatectomy. With the ability to generate accurate and detailed images of liver anatomy, including the hepatic vasculature and bile duct structures, 3D modeling offers surgeons a comprehensive view of each donor's unique anatomy. This technology is especially critical in living donor liver transplantation, where donor safety is paramount, and any unforeseen complications can have severe consequences. During preoperative planning, 3D reconstruction enables surgeons to identify anatomical variations that might not be easily discernible through traditional imaging techniques such as CT or MRI. By reconstructing the liver in three dimensions, surgeons can better plan their surgical approach, ensuring that they preserve critical vascular and biliary structures while optimizing graft size and function for the recipient. Intraoperatively, 3D models can be displayed in the operating room to serve as a real-time reference. In conjunction with minimally invasive techniques, such as laparoscopic or robotic-assisted surgery, these models provide surgeons with spatial awareness, guiding precise dissection and reducing the risk of intraoperative complications, such as bleeding or bile duct injury. Indocyanine Green (ICG) Fluorescence: Enhancing Real-Time Visualization ICG fluorescence imaging has emerged as a valuable adjunct in liver surgery, particularly in minimally invasive donor hepatectomy. ICG, a dye that binds to plasma proteins and is rapidly cleared by the liver, can be used to visualize blood flow, bile ducts, and liver segments in real time during surgery. When exposed to near-infrared (NIR) light, the dye fluoresces,

allowing surgeons to differentiate between perfused and non-perfused areas of the liver. In the context of LDLT, ICG fluorescence is used to confirm the boundaries of hepatic segments and ensure accurate liver resection. By visualizing liver segments in real time, surgeons can perform precise parenchymal transection along the correct anatomical planes, minimizing unnecessary damage to critical structures. Additionally, ICG fluorescence helps verify adequate bile duct, reducing the risk of post-operative complications anatomy. Conclusion The integration of 3D reconstruction and ICG fluorescence in MIS donor hepatectomy offers significant advantages in terms of preoperative planning, intraoperative navigation, and real-time visualization. By adopting these tools, surgeons can perform safer, more precise donor hepatectomies, ultimately benefiting both donors and recipients in living donor liver transplantation. Continued advancements in these technologies hold promise for further improving outcomes and reducing complications in this complex and life-saving surgery.

Keywords: Minimally invasive surgery (MIS), living donor liver transplantation (LDLT), 3D Reconstruction, Indocyanine Green (ICG) Fluorescence, Biliary anatomy

Lecture Code : PG02-S1
Session Name : Postgraduate Course 2 (Organ Recovery)
Session Topic : Organ Recovery and Bench Procedures in Deceased Donor Transplantation
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-1

Heart

Ji Seong Kim
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I will be discussing organ recovery and bench procedures in deceased donor heart transplantation, with a particular focus on donor heart procurement. In my presentation, I will walk you through: Donor selection and evaluation: Identifying suitable heart donors, including criteria such as medical history, cause of death, and organ function. Surgical procurement: Detailed steps of heart retrieval surgery, emphasizing the importance of minimizing ischemia time. Bench procedures: Techniques to assess and prepare the donor heart for transplantation, including necessary repairs or modifications. and some tips for preparing donor procurement team

Keywords: Heart, Transplantation, Procurement, Organ recovery, Bench procedure

Lecture Code : PG02-S3
Session Name : Postgraduate Course 2 (Organ Recovery)
Session Topic : Organ Recovery and Bench Procedures in Deceased Donor Transplantation
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-1

Liver and Abdominal Perfusion

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The procurement process for transplantation is a complex, multi-stage procedure that requires a systematic approach to ensure organ viability and minimize potential complications. This presentation offers a comprehensive guide for surgical teams on the essential stages of liver procurement and covers each aspect from initial inspection through to successful retrieval. The procurement begins with an exploratory laparotomy to inspect the abdominal cavity. The liver's parenchyma is evaluated for texture, color, nodularity, and mass, with specific attention given to incidental findings such as malignancies or traumas. Accurate assessment of liver size, steatosis, fibrosis, and bile production is also crucial. Anatomical variations in hepatic arteries, including accessory or replaced arteries, are carefully noted to avoid injury and ensure proper blood flow. In preparation for cannulation, the retroperitoneal approach along the white line of Toldt is performed, employing techniques like the Cattell-Braasch and Kocher maneuvers. These facilitate exposure of critical vessels, including the distal aorta, inferior mesenteric vein (IMV), inferior vena cava (IVC), and other retroperitoneal structures. Special attention is paid to potential injuries to the right ureter or accessory renal arteries. Cannulation is performed on the IMV and aorta, with heparinization administered three minutes before cannulation to prevent thrombotic events. Challenges such as calcification or intimal dissection in the aorta are addressed with meticulous technique adjustments to prevent embolization. Following successful cannulation, cold perfusion of the liver is initiated to preserve the organ. This step is immediately followed by cross-clamping the aorta, and optionally venting the IVC, with iced preservation solution administered through the IMV and aorta. The organ retrieval phase involves dissecting the hepatoduodenal ligament, careful exploration and preservation of hepatic arteries to avoid vascular complications, and division of the portal vein and IVC at designated points to avoid adversely affecting the procurement of other adjacent organs, including liver. The standardized procurement protocol offers practical insights into liver procurement, underscoring the importance of precision, situational awareness, and handling anatomical variances. Moreover, it aims to improve organ preservation, reduce surgical complications, and enhance transplantation outcomes, making it an essential resource for transplant surgeons aiming to refine their skills in liver procurement.

Keywords: liver transplantation, liver procurement, organ preservation, cannulation techniques, transplant surgery

Lecture Code : PG02-S4
Session Name : Postgraduate Course 2 (Organ Recovery)
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Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-1

Pancreas/Kidney

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For pancreas retrieval, the general principle is to retrieve the pancreas after the liver. In cases where retrieving both the pancreas and liver may jeopardize the liver's post-transplant function, liver retrieval takes priority since liver transplantation is a life-saving procedure. Surgical techniques require a deep knowledge of anatomy and precise execution, along with clear communication with the liver team. Key procedures include midline or cruciate incision, dissection of the aorta and inferior vena cava (IVC) using the extended Kocher maneuver, and mobilization of the pancreas and spleen. In donors after circulatory death, super-rapid techniques must be applied post-perfusion. The back-table procedure involves removing the residual jejunum and duodenum, reinforcing the mesenteric root with sutures, and reconstructing arteries using a Y-graft. Venous reconstruction employs an aortic interposition graft to the portal vein to prevent early thrombotic failure. For kidney retrieval, the procedure occurs after all other organs have been retrieved. Both kidneys are removed en bloc with the aorta, IVC, and ureters. After cold preservation, they are separated for further inspection and dissection on the back table. Surgical precision and knowledge of anatomy are essential for successful retrieval and transplantation.

Keywords: Pancreas retrieval , Back table procedure, Kidney retrieval, -, -

Lecture Code : PG03-S1
Session Name : Postgraduate Course 3 (Basic)
Session Topic : Overview of Updated Immunology
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 6F-1

Introduction of Major Immune Cell Types

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KAIST, Republic of Korea

During microbial infections or allo-rejection, various types of immune cells are involved in each steps of immune responses. As members of the innate immunity, neutrophils, monocytes, macrophages, and dendritic cells initiate immune responses by sensing pathogen- or damage- associated molecular patterns. Consequently, adaptive immune cells such as B and T lymphocytes are activated in an antigen-specific manner and exert their own effector functions. In this talk, I will introduce major immune cell types and their subsets in the aspect of their phenotypes and functions.

Keywords: Immune cell, Lymphocyte, Innate immunity, Adaptive immunity

Lecture Code : PG03-S2
Session Name : Postgraduate Course 3 (Basic)
Session Topic : Overview of Updated Immunology
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 6F-1

Toll-like Receptors and Innate Immunity

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Innate immunity serves as the body's first line of defense against invading pathogens and plays a crucial role in the immediate recognition and elimination of these threats. Unlike adaptive immunity, which develops over time and requires prior exposure to specific antigens, innate immunity is always active, ready to respond within minutes to hours following an infection. This early response is not only vital for containing infections but also for shaping and regulating the subsequent adaptive immune response. Innate immunity is primarily activated by recognition of pathogen-associated molecular patterns (PAMPs), which are conserved structures found in various microorganisms, including bacteria, viruses, and fungi. This recognition is mediated by a specialized set of receptors known as innate immune receptors, such as Toll-like receptors (TLRs), NOD-like receptors (NLRs), and RIG-I-like receptors (RLRs). These receptors are expressed on a variety of innate immune cells including macrophages, dendritic cells, and neutrophils. Upon binding to PAMPs, these receptors initiate signaling cascades that lead to the activation of immune cells, the production of pro-inflammatory cytokines, and the recruitment of additional immune cells to the site of infection. In addition to defending the body against pathogens, innate immunity also plays a key role in non-infectious settings, such as during tissue damage or stress. Damage-associated molecular patterns (DAMPs), which are released from injured or dying cells, are recognized by the same innate immune receptors, leading to the initiation of inflammatory responses. This process is critical for repairing tissue and maintaining homeostasis, but when dysregulated, it can lead to chronic inflammation and autoimmune diseases. While innate immunity is crucial for immediate pathogen defense, it also has a broader role in the regulation of immune responses. For instance, innate immune cells, such as dendritic cells, play a pivotal role in antigen presentation to T cells, thus bridging the innate and adaptive immune systems. Additionally, innate immune responses are involved in processes such as tissue rejection during organ transplantation and in the pathogenesis of autoimmune diseases, where inappropriate activation of the immune system leads to tissue damage. In this lecture, we will explore the various innate immune receptors involved in detecting pathogens and danger signals, and discuss the complex signaling pathways they activate. We will also examine how these pathways contribute to both protective immunity and

pathological conditions such as chronic inflammation and autoimmunity. By understanding the mechanisms of innate immune activation, we can gain insights into how the immune system maintains balance and how its dysregulation can lead to disease.

Keywords: Innate Immune Receptor, Innate Immunity, PAMP, DAMP, PRR

Lecture Code : PG03-S3
Session Name : Postgraduate Course 3 (Basic)
Session Topic : Overview of Updated Immunology
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 6F-1

Antigen Receptors of Adaptive Immunity

Soo Seok Hwang
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Abstract: The adaptive immune system relies on specialized antigen receptors, namely B cell receptors (BCRs) and T cell receptors (TCRs), to recognize and respond to diverse pathogens. This lecture will explore the molecular structure and function of these receptors, detailing how BCRs and TCRs bind to specific antigens and initiate intracellular signaling cascades essential for immune responses. Additionally, we will discuss the clinical significance of antigen receptor signaling, including its role in immunological disorders and targeted therapies.

Keywords: BCR, TCR, adaptive immunity, signaling, antigen receptor

Lecture Code : PG03-S4
Session Name : Postgraduate Course 3 (Basic)
Session Topic : Overview of Updated Immunology
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 6F-1

Overview of Innate and Adaptive Cytokines

Hye Young Hye Young
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Overview of Innate and Adaptive Cytokines in Immunology Cytokines are essential mediators of immune responses, playing a crucial role in both innate and adaptive immunity. These small, secreted proteins act as messengers that enable immune cells to communicate with each other, orchestrating a coordinated response to infections and other challenges to the immune system. The innate immune system provides a rapid initial response to infections through various cells, including innate lymphoid cells (ILCs), macrophages, dendritic cells, and neutrophils, which produce cytokines that influence inflammation and shape subsequent adaptive immune responses. Examples of key innate cytokines include tumor necrosis factor (TNF), interleukins (e.g., IL-1, IL-6), interferons (e.g., IFN-α, IFN-β), and chemokines, which help recruit additional immune cells to sites of infection or injury. The adaptive immune system, mediated primarily by T and B cells, generates a more specific but slower response. Here, cytokines play a critical role not only in immune specificity and memory but also in promoting the activation, differentiation, and proliferation of T helper cells (e.g., Th1, Th2, Th17) and cytotoxic T cells. Important adaptive cytokines include IL-2, IL-4, IL-10, and interferon-gamma (IFN-γ), each of which regulates distinct aspects of immune function. For example, IFN-γ is crucial for the activation of macrophages and enhancing antigen presentation, while IL-4 is key in B cell differentiation and antibody production. This presentation provides an overview of the distinct yet interconnected roles of cytokines in innate and adaptive immunity, highlighting their functions, regulatory mechanisms, and clinical relevance. The crosstalk between these two branches of immunity is mediated largely through cytokines, where innate cytokines not only modulate immediate immune responses but also influence the quality and magnitude of adaptive responses. Conversely, adaptive cytokines can feedback to regulate innate immunity, creating a dynamic and tightly regulated network.

Keywords: cytokine, innate immunity, adaptive immunity, Inflammation

Lecture Code : VT01-S1
Session Name : Vitallink Symposium 1
Session Topic : How to Improve Public Awareness in Deceased Organ Donation in Asia
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-2

Knowledge, Attitudes and Willingness to Organ Donation in Asia

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Organ donation is crucial for developing transplantation program but in many Asian countries it relies on living donors. This fact causes pressure on donors' safety and social security. To promote donation from deceased donors, understanding knowledge, attitude and willingness to organ donation is compulsory. A few studies were conducted in Vietnam to show how people perceive the concept of brain death, cardiac death, organ donation and organ sharing. The first study completed in 2011 showed that more than 80% of 1063 interviewees in Ho Chi Mich City had knowledge on organ demand and brain death; 75.5% of them acknowledged organ donation and sharing as a humanity act; 77% of them agreed to donate their own kidneys after death, and 63.8% of them agreed to donate kidneys of their relatives after death. The main reason for the refusal was the fear that family members would disagree. Other reasons included concept of "intact body", complicated administrative procedure to donate, and importantly the skepticism about nontransparent and inequitable use of donated organs. Among respondents, 19.4% requested financial support. Another study conducted in 2015 interviewing family members of thirty potential donors in neurological ICU and Cardiology department at Cho Ray hospital-Ho Chi Minh City to have their thoughts about donation after death. The rate of non-respondents was 16,7%-56,7%, and the rate of agreement was less than 50%. The most recent study completed in 2023 aimed to find the measures for promoting organ donation. The investigators considered Law and legal system as a crucial factor for promoting organ donation. The compensation for donors was a topic of debate. More surveys on diverse groups of population must be conducted to find the barriers to organ donation. In Vietnam, the legal system might be one of the important drivers for improving the donation rate, along with enhancing communication and education. Compensation for donors was a topic of active discussion.

Keywords: organ donation , public awareness , attitudes, Vietnam, Asian countries

Lecture Code : VT01-S2
Session Name : Vitallink Symposium 1
Session Topic : How to Improve Public Awareness in Deceased Organ Donation in Asia
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-2

Common Myths and Misconceptions in Deceased Organ Donation

Jeremy Chapman
Westmead Hospital , Australia

The first myth holding back deceased organ donation in Asia, is that it can be achieved with minimal government support. While that is true of living kidney and liver donation for transplantation of wealthy individuals, the permanent infrastructure needed to support deceased organ donation cannot be provided by 'user pays' healthcare financing. The solution found globally is that government investment in enabling deceased organ donation repays the community through the wellbeing of its citizens and reduction in costs of dialysis and care of people with liver failure. The second myth is that community attitudes to brain death and organ donation, driven by cultural and religious norms in that community, are the critical factors determining the donation rate. In most communities consent to donation is achievable in 40-50% of potential donors no matter which country, as long as there is trust in the medical profession and that brain death is understood in the community. Thus attention to public attitudes needs to be driven by educational goals with less focus on persuading people to donate. The third myth is that the people whose attitudes are most critical are the relatives of potential donors. While the relatives are of course both central and important, the attitudes of the Intensive Care physicians and nurses, as well as their training and knowledge of bereavement and end of life care, are fundamental. If families are not approached in a professional and trained manner, consent to donate is usually not forthcoming. The fourth enduring myth, perpetuated by many transplant programs in Asia, is that transplantation is for the community. It is instead for the section of the community that can afford transplantation. In wealthy developed nations one can say that any individual is three or four times more likely to receive a transplant than donate organs. In too many resource poor counties the truth is many can be donors but few can receive transplants.

Keywords: organ donation, deceased donation, consent, brain death, public attitudes

Lecture Code : VT01-S3
Session Name : Vitallink Symposium 1
Session Topic : How to Improve Public Awareness in Deceased Organ Donation in Asia
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-2

National and International Support to Improve Public Awareness

Peter Stock
University of California, San Francisco, USA

This panel discussion will focus on national and international strategies that have been successful in increasing the donation of deceased donor organs, and at the same time increase public awareness. Links to websites for organizations for potential collaborations depending on the specific needs of a country will be provided.

The Alliance (https://www.organdonationalliance.org) unites the organ donation, transplantation and healthcare community to promote collaboration, cascade innovations and share effective practices for the benefit of restoring lives through transplantation. The Alliance has a new international committee/work force initiative, and the website provides links for strategies for education and increasing the numbers of organs procured from deceased donors.

The most successful increase in the numbers of organs procured from deceased donors has come from programs that engage a diverse group of transplant providers matched to a diverse group of families considering deceased donation. This has been the strategy used in the rapid increase in the number of deceased donors in the UAE and Qatar and embrace the cultural diversity of the country and provide equitable access for citizens and non-citizens alike. In the US, maximizing diversity has led to significant increases in the donation rates of people of African decent in the bay area (acaradine@dnwest.org; https://www.donornetworkwest.org) using similar strategies.

The use of social media provides a valuable opportunity for publicity – and examples are provided in The Alliance website (link above). Other examples of very effective strategies used to increase public awareness include educational videos to embrace both young (https://www.donoralliance.org/get-

involved/transplantation-science-in-the-classroom) and adults (https://www.youtube.com/watch?v=JAk9W4BGXoo&t=7s)

Finally, and perhaps most importantly, supporting donor families is imperative. Strategies include honoring the donor's and their families at annual events, as well as providing the opportunity for linking the donor families to the recipients, which can be an important part of the healing process (https://www.donornetworkwest.org/donor-families; https://www.transplantnet.org)

Lecture Code : VT01-S4
Session Name : Vitallink Symposium 1
Session Topic : How to Improve Public Awareness in Deceased Organ Donation in Asia
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-2

Activities of NGOs and International Organizations for Public Awareness

YINGYOS AVIHINGSANON
Chulalongkorn University, Thailand

The organ donation rate in Asia remains lower than the Westerns. Many factors have been attributed, including healthcare infrastructures, financial concerns, public awareness, and knowledge of healthcare providers. In Southeast Asia, the organ donation rate varies widely from less than 2 per million population (ppm), whereas Thailand leads the highest rate in this region. Non-government organizations (NGO) in Thailand play important roles in public awareness, particularly deceased donor campaigns during special occasions of royal family. Thailand has launched a campaign of deceased organ donation as its target of 1000 kidney transplants by 2024. This is an ongoing collaboration of key organizations of the country, including, but not limited to, the Thai Transplant Society (Thai TS), Thai Red Cross Organ Donation Center (TRC-ODC), Ministry of Public Health (MoPH), and the Kidney Foundation of Thailand (KFT). In the year 2000, Thailand had a low rate of organ donation (<2.6 cases per million population). The Thai TS launched a countrywide survey on the factors that determined barriers to organ donation. The project led to the transformation of transplant policy by the MoPH. Despite the middle-income economy of Thailand, organ transplants in the country have been financially supported by all kinds of health insurance. This policy makes all Thai citizens undergo organ transplants without financial barriers. To increase public awareness, the KFT and TRC-ODC continuously launched campaigns of organ donation, which successfully increased organ donors from 2.6 up to 6.8 cases per million in the last decade (2014-2024). The KFT aimed for the 1000 kidney transplants as the country's aspiration. Public awareness is largely influenced by royal family ceremonies as well as all kinds of media. TRC-ODC and Thai TS responded to this campaign by promoting the career of transplant coordinator, developing transplant workforces, and providing transplant fellowships. While waiting for the Human Organ Transplant Act, TRC-ODC and the Medical Council have actively combated transplant tourism and organ trafficking. Leading by the Thai TS, the Thai Transplant Registry and donor database were very useful tools for promoting the transparency and equity of organ transplants in the country.

Keywords: NGO, Transplant Society, Kidney Foundation, Registry, Thailand

Lecture Code : VT01-S5
Session Name : Vitallink Symposium 1
Session Topic : How to Improve Public Awareness in Deceased Organ Donation in Asia
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-2

Success Stories from Asia: Utilizing Media and Celebrity Endorsements

ROSE MARIE LIQUETE
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Improving Public Awareness in Deceased Organ Donation in Asia Topic: Utilizing Media and Celebrity Endorsements Introduction to Deceased Organ Donation Definition: Deceased organ donation occurs when an individual, declared brain dead or having experienced cardiac death, donates their organs for transplantation. Process: Involves a multi-step process: investigation of the cause of death, assessment of donor eligibility based on specific criteria. Organs typically donated include the heart, lungs, liver, kidneys, and pancreas. Importance: Offers a second chance at life for individuals suffering from organ failure due to lifestyle-related diseases or serious medical conditions. Challenges in Asia Cultural and Religious Barriers: Deep-seated beliefs about organ donation can hinder acceptance. Traditional practices and religious doctrines (e.g., Buddhism, Islam, Hinduism) often create resistance. Legal and Ethical Frameworks: Inconsistent laws across countries lead to ethical dilemmas regarding consent and equitable allocation of organs. Issues related to organ trafficking and black markets complicate the landscape. Limited Public Awareness: Many individuals lack accurate information about the organ donation process and its benefits. Financial Support: Insufficient government funding limits awareness campaigns, education, and healthcare access. Wastage of Organs: Many potential brain death patients are not recognized in intensive care units, leading to missed opportunities for organ donation. Strategies for Improvement Increasing Donor Registries: Promote the importance of registering as an organ donor. Understanding the Process: Simplify and clarify the organ donation process through educational materials. Addressing Myths and Misconceptions: Use media to debunk common myths surrounding organ donation. Cultural and Religious Sensitivity: Collaborate with religious leaders to create culturally sensitive messaging. Family Discussions: Encourage families to discuss organ donation openly. Improving Outcomes: Highlight success stories of organ recipients to demonstrate the life-saving potential of organ donation. Advocacy and Policy Change: Work with policymakers to create supportive legislation for organ donation. Reducing Emotional Burden: Provide resources and support for families considering organ donation. Utilizing Media and Celebrity Endorsements Media Influence: The rise of short-form video content on platforms like TikTok and Instagram allows for quick, impactful messaging. Audiences are drawn to genuine connections and

personal stories shared by celebrities. Celebrity Endorsements: Celebrities can amplify important messages and encourage public participation. Their influence can foster a community-oriented approach to advocacy and awareness. Pros of Media and Celebrity Involvement Instant Reach: Messages can be disseminated quickly to target audiences without delay. Engagement: Encourages active participation from the public, fostering a sense of community around the cause. Research Methods Qualitative Methods: Collect and analyze non-numerical data to explore motivations, perceptions, and behaviors related to organ donation. Quantitative Methods: Collect and analyze numerical data to measure the prevalence and effectiveness of awareness campaigns. Conclusion Improving public awareness of deceased organ donation in Asia requires a multifaceted approach that leverages media and celebrity endorsements. By addressing cultural sensitivities, providing accurate information, and engaging influential figures, we can foster a more informed and supportive environment for organ donation, ultimately saving lives and transforming the organ transplantation landscape in the region.

Keywords: Public Awareness in Deceased Organ Donation, Media and Celebrity Endorsements, Brain Death Recognition, Advocacy , Saving Lives

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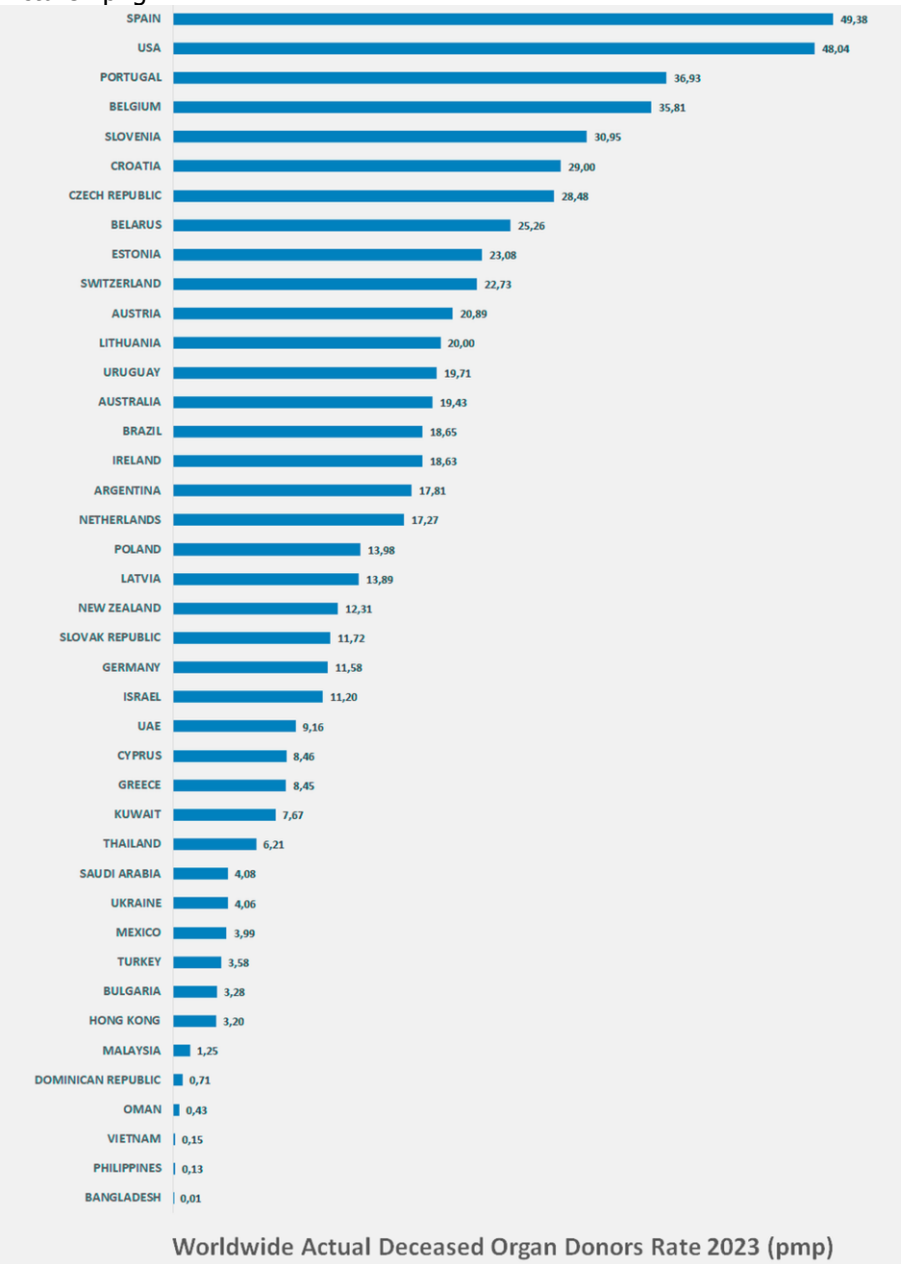

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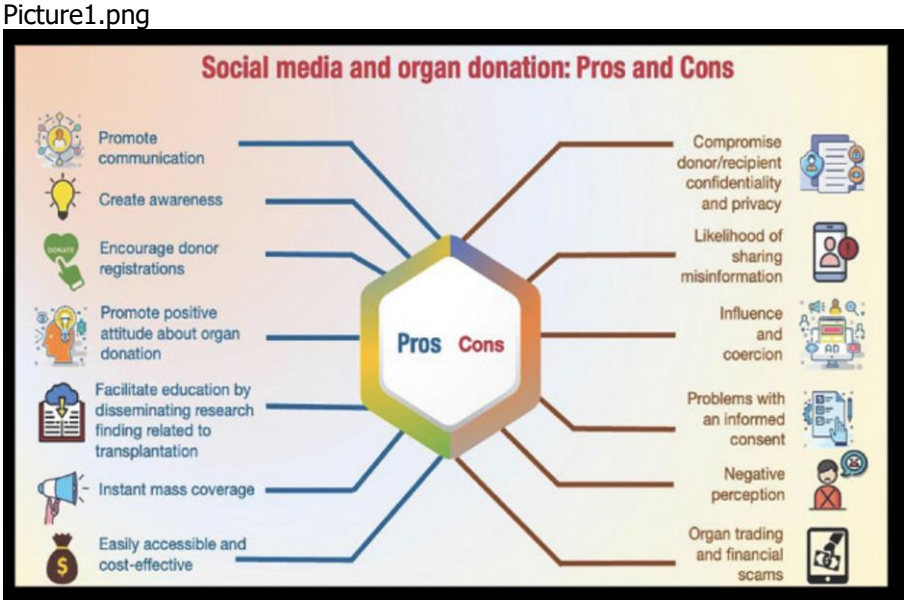

Lecture Code : VT01-S7
Session Name : Vitallink Symposium 1
Session Topic : How to Improve Public Awareness in Deceased Organ Donation in Asia
Date & Time, Place : November 14 (Thu) / 08:30-10:00 / Room 5F-2

Success Stories from Asia: Introduction to the Activities of the Voice of Life Choir

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1. Background and Purposes The Voice of Life Choir is the only one in the world composed of families of organ donors, transplant recipients, and and Those who signed donor card. The choir first started as part of an international conference program called ISODP held in Korea in 2015. we learned that healing through song is surprisingly effective for donor's family. 2. Situation analysis & Activities of Choir The Voice of Life Choir currently has 69 members, 48% of donor families, 32% of transplant recipients, 14% of those who have pledged to become organ donors, 3% of people from related organizations, and 3% of conductor and accompanist. With its official founding in February 2016, it began with a male ensemble performance at the International Rotary Club of that year, followed by a transplant sports competition, hospital organ donor dedication day, and an organ donation day ceremony. Performances continued. We are performing at the congress of Korean Society for Transplantation, and at the "Memorial event for organ donors" at KODA. Hospital performances for patients and medical staff are also very special for the choir. 3. Conclusion The Voice of Life Choir is carrying out many meaningful activities even though its national support is less than 50% of its total operating expenses, and families of the donors are very significant as leaders in revitalizing organ donation and improving awareness. We recommend a cultural approach to many countries as it can overcome the limitations of the Asian perception of physical harm and provide an opportunity for further development. It also seems to have a positive effect on the healing of bereaved families, and has additional effects such as symbolism for organ donation and exposure to the media.

Keywords: Voice of Life Choir, donors family, song, healling

Lecture Code : PG04-S2
Session Name : Postgraduate Course 4 (Liver)
Session Topic : Minimally Invasive Donor Hepatectomy (Video Session)
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 3F-1

Laparoscopic Donor Hepatectomy 2 - Unusual Graft

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Living donor liver transplantation (LDLT) is treatment of choice of end-stage liver disease patient due to lack of deceased donor in Asia. Living donor hepatectomy and related donor's complications are one of the most important factors in LDLT setting, because donor's safety is top priority. For this reason, living donor hepatectomy has been commonly performed in donors without anatomical variations, and there has been a much slower development compared with other minimally invasive surgery. Anatomical variations of donor's liver are the controversial issues for laparoscopic donor hepatectomy. But, despite of these issues, laparoscopic donor hepatectomy is being tried consistently and pure laparoscopic donor hepatectomy can be cautiously expanded to donors with hepatic anatomic variations. With the much experience of donor's right and left hepatectomy, recently, right posterior section has been also procured by totally laparoscopic approach. Laparoscopic living donor hepatectomy is feasible tool in donor's recovery and cosmetic satisfaction but because of its technical challenge, complexity of procedure and concern about donor's safety, surgeons has been hesitated to apply standard procedure. But with much experience in laparoscopic liver resection and liver transplantation, it is expected that laparoscopic living donor hepatectomy will increase steadily in many centers, including ours.

Keywords: minimally invasive donor hepatectomy, Liver graft, living donor liver transplant , anatomical variation, right posterior section graft

Lecture Code : PG04-S3
Session Name : Postgraduate Course 4 (Liver)
Session Topic : Minimally Invasive Donor Hepatectomy (Video Session)
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 3F-1

Robotic Donor Hepatectomy 1 - Preparation, Liver Mobilization, Hilar Dissection

Dieter Broering
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Introduction
The evolution of robotic surgery in transplantation, particularly robotic donor hepatectomy, represents a significant advancement in minimizing invasiveness, yet it faces challenges in widespread adoption, especially in Western centers due to the rarity of large-volume living-donor liver transplant programs. This video presentation demonstrates the steps involved in the robotic approach for living donor hepatectomy, emphasizing patient positioning, port placement, liver mobilization, and up to the point of hilar dissection.

Patient Positioning and Ports Placement
The donor is positioned supine with a 30-degree reverse Trendelenburg tilt and slightly rotated to the right. Stability is ensured using a bean-bag device. A pneumoperitoneum is established through an umbilical port, followed by the placement of four ports along the midclavicular and anterior axillary lines. These ports are arranged in a 'smiling' line configuration, facilitating optimal robotic arm movement and access, particularly when a left lobe or left lateral hepatectomy is required, necessitating a larger right flank port for the robotic stapler.

Liver Mobilization
For right donor hepatectomy, mobilization begins with the transection of the teres and falciform ligaments, extending up to the hepatic veins. The groove between the right and middle hepatic veins is identified and marked. The liver is mobilized using robotic arms to retract and expose significant anatomical structures including the right kidney's Gerota fascia and right adrenal gland. Retroperitoneal and diaphragmatic attachments are dissected to fully mobilize the right lobe and expose the inferior vena cava, ensuring all necessary structures are visible and accessible.

Hilar Dissection

The dissection commences with a cholecystectomy to improve visibility and access to the hilum. The portal vein is the first structure to be isolated, followed by dissection of the right hepatic artery while preserving biliary anatomy. Special attention is given to individual anatomical variations, which can dictate the sequence and approach to vascular and biliary dissection, ensuring optimal preservation of donor anatomy.

Lecture Code : PG05-S1
Session Name : Postgraduate Course 5 (Kidney/Pancreas)
Session Topic : Update in Immunosuppression for KT
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-1

Update in Induction Therapy in Kidney Transplantation

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Induction therapy plays a critical role in the early management of kidney transplant recipients, reducing acute rejection and improving graft survival. Traditionally, induction therapy includes the use of depleting agents, such as antithymocyte globulin (ATG) and alemtuzumab, as well as non-depleting agents like interleukin-2 receptor antagonists (IL-2RA) such as basiliximab.[1] This approach is primarily guided by the immunological risk of the recipient, with T cell-depleting agents preferred for patients with higher immunologic risk and non-depleting agents used in standard-risk cases.[2] Historically, the need for potent induction therapy arose due to limitations in early immunosuppressive regimens. Over time, newer immunosuppressive agents, including tacrolimus and mycophenolate mofetil, have improved maintenance protocols, raising questions about the optimal use of induction therapy.[3] Current practice varies widely, influenced by patient risk factors such as prior sensitization, donor type, and pre-existing antibodies, as well as practical considerations like infection risk, side effects, and cost.[4] Emerging evidence suggests that while depleting agents may reduce rejection rates compared to IL-2RAs in high-risk recipients, their benefits are accompanied by increased risks, including infections and possible malignancies, particularly in well-matched or low-risk patients.[5] For this cohort, recent studies highlight the viability of minimized induction protocols or even the elimination of induction therapy without compromising graft survival.[6] 1. Laftavi MR, Sharma R, Feng L, Said M, Pankewycz O. Induction therapy in renal transplant recipients: a review. Immunol Invest. 2014;43(8):790-806. 2. Hellemans R, Bosmans JL, Abramowicz D. Induction Therapy for Kidney Transplant Recipients: Do We Still Need Anti-IL2 Receptor Monoclonal Antibodies? Am J Transplant. 2017;17(1):22-27. 3. Potluri VS, Bloom RD. Induction Therapy in Immunologically Well-Matched Recipients: Less May Be More. Clin J Am Soc Nephrol. 2022;17(2):173-175. 4. Wiseman AC. Induction Therapy in Renal Transplantation: Why? What Agent? What Dose? We May Never Know. Clin J Am Soc Nephrol. 2015;10(6):923-925. 5. Szumilas K, Wilk A, Wisniewski P, et al. Current Status Regarding Immunosuppressive Treatment in Patients after Renal Transplantation. Int J Mol Sci. 2023;24(12). 6. Grgic I, Chandraker A. Significance of biologics in renal transplantation: past, present, and future. Curr Opin Organ Transplant. 2018;23(1):51-62.

Keywords: Induction therapy, Biologic agent , Depleting agents, Non-depleting agents, Immunologic risk

Lecture Code : PG05-S2
Session Name : Postgraduate Course 5 (Kidney/Pancreas)
Session Topic : Update in Immunosuppression for KT
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-1

Long-Term Efficacy and Safety of Everolimus Versus Mycophenolate in Kidney Transplant Recipients Receiving Tacrolimus

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Everolimus became available in the United States in 2003 and in Japan in 2008 as one of the mTOR inhibitors, and is a very important immunosuppressant as an option. The most significant feature is that it can reduce the amount of CNI used in combination. CNI toxicity would be reduced. Second significant feature is suppression of CMV. CMV seronegative patients would receive great benefit. CMV antigenemia and disease will be usually controlled with conversion MMF to everolimus. Everolimus also has a possible favorable effect against BKV. Recently, it has been reported that it may be effective against malignant tumors even non-skin cancers, suppress graft fibrosis, and suppress anti-HLA antibody production. However, caution is required because it also has characteristic adverse effects such as stomatitis, proteinuia, hyperlipidemia, and delayed wound healing. In this postgraduate course, I will introduce its safety and efficacy, precautions, and adverse effects when used in combination with tacrolimus through our 15 years of experience of everolimus usage.

Keywords: everolimus, immunosuppression, CNI toxicity, CMV infection

Lecture Code : PG05-S3
Session Name : Postgraduate Course 5 (Kidney/Pancreas)
Session Topic : Update in Immunosuppression for KT
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-1

New Perspectives for the Therapeutic Drug Monitoring of Tacrolimus

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Renal transplantation is now the best treatment for end-stage renal failure. To avoid rejection and prolong graft function, organ recipients need immunosuppressive therapy. Tacrolimus (FK506), a calcineurin inhibitor (CNI) introduced in the field of transplantation in the 1990s, is the cornerstone immunosuppressant in organ transplantation, particularly renal transplantation. It is crucial for preventing graft rejection and improving graft survival. However, its narrow therapeutic index and high inter-patient variability necessitate careful therapeutic drug monitoring (TDM) to optimize patient outcomes and minimize adverse effects. Traditional TDM methods, such as trough level measurement (C0), have been widely used but present challenges in achieving precise dosage adjustments due to variability in pharmacokinetics among patients. In recent years, novel approaches in TDM have shown promise in overcoming these limitations. This presentation explores new perspectives in tacrolimus monitoring, including the application of pharmacogenomics, real-time monitoring technologies, artificial intelligence (AI), and machine learning. Pharmacogenomics enables personalized dosing strategies by considering genetic factors that influence drug metabolism. Meanwhile, continuous monitoring technologies offer the potential for more responsive and dynamic management of Tacrolimus levels, reducing the risk of toxicity and rejection. We will review the existing Tacrolimus monitoring methods and their limitations, and examine new monitoring methods to overcome them, to help improve the future of Tacrolimus monitoring and patient care in transplant medicine.

Keywords: Tacrolimus, TDM, Renal transplantation, pharmacogenetics, graft outcome

Keywords: Tacrolimus, TDM, Renal transplantation, pharmacogenetics, graft outcome

Lecture Code : PG05-S4
Session Name : Postgraduate Course 5 (Kidney/Pancreas)
Session Topic : Update in Immunosuppression for KT
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-1

Management of Drug Toxicity

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The number of kidney transplants has been steadily increasing, remaining above 2,000 per year since 2016. In particular, as the proportion of transplants in immunologically high-risk groups has increased, the number of patients receiving kidney transplants after desensitization has risen sharply from 4.1% in 2008 to 20.8% in 2016. The IL-2 receptor antagonist (Basiliximab) has long been the predominant agent used for induction immunosuppression, but the use of antithymocyte globulin (Thymoglobulin) has gradually increased, rising from 6.7% in 2008 to 20.2% in 2016. Maintenance immunosuppressants commonly used include steroids, tacrolimus, and mycophenolate mofetil. According to the Korean Society of Nephrology factsheet, the 10-year survival rate in Korea shows that the death-censored graft survival rate is 77.6%, while the patient survival rate is 92.8%. The causes of graft loss in kidney transplant patients can be categorized into immunologic and non-immunologic factors. Among the immunologic factors, important contributors are preformed donor-specific antibodies (DSA) and de novo DSA, both of which ultimately lead to chronic dysfunction. Non-immunologic factors include donor-related factors such as age or cardiovascular comorbidities, and recipient-related factors like delayed graft function, diabetes, dyslipidemia, hypertension, infections, calcineurin inhibitor nephrotoxicity, and inappropriate use of nephrotoxic drugs, all of which can contribute to chronic dysfunction. Therefore, in kidney transplant patients, the immune system must carefully balance the risk of rejection and infection by appropriately tailoring immunosuppressive regimens to the specific characteristics of each patient. In particular, several clinical manifestations of drug toxicities induced by immunosuppressive therapy post-transplantation can develop. Corticosteroids may lead to hypertension, glucose intolerance, dyslipidemia, and osteoporosis. Azathioprine can cause myelosuppression and hepatotoxicity. Mycophenolic acid may result in myelosuppression, diarrhea, and gastrointestinal upset. Cyclosporine can cause hypertension, glucose intolerance, dyslipidemia, gum hypertrophy, hirsutism, neurotoxicity, and nephrotoxicity. Tacrolimus has a similar profile to cyclosporine, but with a higher incidence of glucose intolerance and neurotoxicity, while showing a lower incidence of hypertension, dyslipidemia, gum hypertrophy, and hirsutism. Sirolimus/Everolimus may lead to hyperlipidemia, thrombocytopenia, poor wound healing, and oral ulcers.

Belatacept can increase the risk of post-transplant lymphoproliferative disorder. Unfortunately, apart from monitoring trough drug levels, there are currently no clinically useful tools available to precisely manage immunosuppressive therapy. The proper use of these drugs could enhance therapeutic effects while minimizing adverse drug reactions. Therefore, in this context, I will explore the drug toxicities and long-term chronic adverse effects of immunosuppressants in kidney transplant patients, and introduce appropriate treatment methods for managing these issues.

Keywords: kidney transplantation, immunosuppressant, toxicity, monitoring, graft survival

Lecture Code : PG06-S2
Session Name : Postgraduate Course 6 (Basic)
Session Topic : Immune Activation and Effector Mechanisms
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 6F-1

Helper 17 T Cells and Neutrophils

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Neutrophils, the most abundant immune cells in human peripheral blood, play critical roles in antimicrobial defense and inflammation. Known for their heterogeneity and complex subcellular localization, neutrophils are key components of the innate immune system, combatting infections, autoimmune diseases, and cancer. Similarly, T-helper 17 (Th17) cells, which produce interleukin 17 (IL-17), are essential for maintaining mucosal immune balance and infection defense, while also mediating several autoimmune conditions. The interaction between Th17 cells and neutrophils forms a crucial axis in immune regulation, influencing both immune homeostasis and pathological processes. IL-17A, produced by Th17 cells, is central to this interaction. It stimulates granulocyte colony-stimulating factor (G-CSF) production, enhancing neutrophil generation and mobilization from the bone marrow to sites of inflammation. Although IL-17A does not directly activate neutrophils, it induces chemokine release (e.g., CXCL8) from non-immune cells such as epithelial and endothelial cells, guiding neutrophils to infection or inflammation sites. Once recruited, neutrophils perform key antimicrobial actions through phagocytosis, degranulation, and the formation of neutrophil extracellular traps (NETs), which trap and kill pathogens but may also cause collateral tissue damage. Notably, NETs can reciprocally influence Th17 cells by promoting the upregulation of RORγt expression, which sustains Th17 differentiation and IL-17A production, creating a feedback loop that intensifies the inflammatory response. This Th17-neutrophil interaction is particularly significant in chronic inflammatory diseases. In conditions such as psoriasis and autoimmune disorders, an overactive IL-17A pathway leads to excessive neutrophil recruitment and activation, which in turn aggravates inflammation and tissue damage. For example, in psoriasis, IL-17A and associated chemokines drive neutrophil infiltration in skin lesions, contributing to inflammation and disease progression. Similarly, in autoimmune diseases like rheumatoid arthritis, the Th17-neutrophil axis fuels chronic inflammation and joint damage. These findings underscore the need for precise modulation of this pathway to restore immune balance without suppressing essential immune functions. Current therapeutic approaches targeting IL-17A offer promising avenues for managing diseases driven by Th17 and neutrophil dysregulation. Drugs like secukinumab and ixekizumab, which inhibit IL-17A activity, have shown clinical efficacy in treating

conditions like psoriasis and psoriatic arthritis by reducing inflammation and neutrophil recruitment. Such therapies underscore the therapeutic potential of modulating the Th17-neutrophil axis, not only for controlling inflammation but also for preserving tissue integrity in chronic inflammatory diseases. In summary, the dynamic interplay between Th17 cells and neutrophils forms a critical regulatory mechanism in immune responses, particularly within inflammatory and autoimmune diseases. Understanding this bidirectional interaction is vital for developing targeted therapies aimed at reducing harmful inflammation while supporting host defense mechanisms. This review highlights the essential role of Th17-neutrophil interactions in disease progression and the promising impact of IL-17A-targeted therapies in managing autoimmune and chronic inflammatory conditions.

Keywords: T-helper 17 cells, Neutrophils, Interleukin-17, autoimmune diseases, chronic inflammation

Lecture Code : PG06-S3
Session Name : Postgraduate Course 6 (Basic)
Session Topic : Immune Activation and Effector Mechanisms
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 6F-1

B Cells and Follicular Helper T Cells

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This lecture provides an overview of the critical roles B cells and follicular helper T cells (Tfh) play in adaptive immunity, focusing on their interactions and contributions to humoral responses. B cells, through antigen presentation and antibody production, are central to humoral immune responses, while Tfh cells, a specialized subset of CD4+ T cells, support B cell activation, differentiation, and germinal center formation. Key molecular mechanisms, such as the interaction of CD40-CD40L, ICOS-ICOSL signaling, and cytokine production (e.g., IL-21), underpin the cooperation between B cells and Tfh cells, promoting antibody class switching and affinity maturation. The lecture will also cover the different subsets of B cells and Tfh cells, and their distinct roles in immune regulation. This will further explore how the dysregulation of these cellular interactions contributes to transplantation rejection. Understanding the dynamics of B cells and Tfh cells is crucial for developing effective therapies that minimize rejection while promoting long-term graft survival.

Keywords: B cell, Follicular helper T cell, Humoral immunity, Germinal center

Lecture Code : PG06-S4
Session Name : Postgraduate Course 6 (Basic)
Session Topic : Immune Activation and Effector Mechanisms
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 6F-1

Cytotoxic T Cells

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Cytotoxic CD8 T cells, often referred to as cytolytic T lymphocytes (CTLs), play a pivotal role in the adaptive immune system, specifically in the defense against intracellular pathogens, such as viruses, and in the elimination of tumor cells. When naïve CD8 T cells encounter an antigen presented on MHC class I molecules by APCs, they receive the T cell receptor (TCR)-mediated signal (Signal 1), which involves specific antigen recognition. Additionally, the costimulatory signal (Signal 2) through molecular interactions between the T cell and the APC, along with cytokine-mediated signal (Signal 3) from interleukins and interferons secreted by APCs and other immune cells, are pivotal for a complete activation response. Though direct cytolytic activity and secretion of cytokines, CD8 T cells are crucial in maintaining immune surveillance and mediating immune response. A critical aspect of the CD8 T cell response is the formation of memory CD8 T cells after an infection is resolved or tumor cells are cleared. These memory T cells persist long-term in the host, providing rapid and robust protection upon re-encounter with the same antigen. In the context of organ transplantation, CD8 T cells are key mediators of transplant rejection, as they can recognize foreign antigens presented by MHC class I molecules on the surface of donor cells, identifying them as "non-self." This recognition triggers the activation of CD8 T cells, which then launch an immune response against the graft, leading to graft damage or rejection. By balancing the need for immune protection with the desire to prevent graft rejection, CD8 T cells remain central to the field of transplantation immunology.

Keywords: CD8, MHC class I, cytotoxicity, memory

Lecture Code : VT02-S1
Session Name : Vitallink Symposium 2
Session Topic : How Can We Overcome Experience from Asia
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-2

Indonesia: Impact of Islamic Religion

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Islam is the second-largest religion globally. Of all Muslim majority countries in the world, the largest Muslim population in a country is in Indonesia. This is about 87% of the Indonesian population and 11.7% of the world's total population.[1] During the past several decades, organ transplants have been increasingly used for the treatment of end-stage organ failure in Indonesia. Today, the transplant procedure rate is 87,5 procedures per year in Cipto Mangunkusumo Hospital and all are living donor. The lack of deceased organ donation programmes and the unwillingness of people to deceased organ donation contributes to an increased demand for living organ donation. As a Muslim majority country, organ transplantations in Indonesia are influenced by its religious perspective. Basically, organ transplantation and donation are permissible in Islam. In contrary, studies have shown that Muslims in the Western world have more negative attitudes toward organ donation and transplantation.[2] We believe other factors contribute to the growth of organ donation and transplantation activities in Muslim countries including the lack of information regarding organ donation, mistrust of the healthcare system, family opinions, sacredness of the body, lack of clear understanding of religious rulings, and opinions of religious leaders. Studies have suggested that partnering with religious leaders may help foster positive attitudes toward organ donation and transplantation.[3] Developing the deceased donor programmes in the country will be vital to counter the countrywide increasing organ shortage. The mainstay transplant activities like organ procurement and distribution systems need to be adequately developed. With education, the behaviour of healthcare professionals and common people can be changed and a positive attitude toward deceased organ donation can be obtained. As healthcare professionals, we should come forward and take responsibility by enrolling ourselves in deceased donors' registration. Public awareness, medical community interest and government support are essential.

Keywords: kidney transplant, religion, living donor, Indonesia

Lecture Code : VT02-S3
Session Name : Vitallink Symposium 2
Session Topic : How Can We Overcome Experience from Asia
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-2

Philippines: Socio-Cultural and Health System Challenges in the Promotion of Deceased Organ Donation in the Philippines

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Deceased organ donation rates remain low in the Philippines, which outranked only another Asian country in the lowest deceased donation rates per million population globally in 2023. The Organ Donation Act (Republic Act 7170), that defined brain death and authorized organ donation after death was implemented as early as 1991, but not much progress has been attained in the past 30 years. Socio-cultural factors and government health care policies pose the biggest challenges to deceased organ donation, resulting in a fundamental lack of awareness and concern, not just among the general population, but in the medical community as well. Religious beliefs, language, education, values and cultural customs affect the next-of-kin's decision-making, view of death and providing consent. Granting consent for donation involves the entire extended family. Organ donation is not part of the basic curriculum for high school, college, and even in medical schools. Referrals by hospitals for deceased donation are not mandated by law. Majority of healthcare professionals are not aware of the diagnosis of brain death, deceased organ donation, and the referral systems in place. There is great disparity in the government health insurance system coverage of modalities of renal replacement therapy, and it is largely in favor of hemodialysis. As the country delves into multi-organ transplantation and with the progressively increasing number of patients on the donor waiting list, innovative and sustainable solutions should be proposed and implemented in general and medical education, legislation and health care policy reforms, through effective utilization of traditional and social media, creation of formidable linkages with public and private organizations, and formal system of transplant coordinator training and preparation..

Keywords: deceased organ donation, health care policy, health education, kidney transplantation, public awareness

Lecture Code : VT02-S4
Session Name : Vitallink Symposium 2
Session Topic : How Can We Overcome Experience from Asia
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-2

Thailand: Challenge and Overcome the Social and Cultural Barriers to Organ Donation in Thailand

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Culture awareness and public engagement in Thailand - Understand and respect the diverse cultural, religiuos and social norms related to organ donation in Thailand and Asian contrries. - Develope culturally sensitive communication strategies for engaging with families and communities about organ donation. - Implement public awareness campaigns to educate and dispel myths about organ donation. - Engage community leaders and use media effectively to promote organ donation awareness.

Keywords: Social awareness, Public engagement, Thailand, organ donation, socio-cultural barriers

Lecture Code : VT02-S5
Session Name : Vitallink Symposium 2
Session Topic : How Can We Overcome Experience from Asia
Date & Time, Place : November 14 (Thu) / 10:30-12:00 / Room 5F-2

Vietnam: Socio-Cultural Barriers to Organ Donation in Vietnam

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Socio-Cultural Barriers to Organ Donation from Asian Countries: Vietnam Organ transplantation program in Vietnam started in 1992, with a successful kidney transplantation from living related donors. In exception of kidney and liver, the transplantation of other organs progressively has been developed but at much slower pace because of the very low rate of deceased donation. We tried to highlight the factors that influence the attitudes and beliefs of Vietnamese people towards organ donation, focusing on socio-cultural barriers, from both donors' and recipients' perspectives. Even though the number of registered potential donors increased, the actual number of deceased donors was still negligible. The adapted to real context strategies must be applied to further promote deceased organ donation and to develop organ transplantation program beyond kidney and liver.

Keywords: organ donation , socio-cultural barriers, Vietnam, Asian countries, -

Lecture Code : PG07-S2
Session Name : Postgraduate Course 7 (Liver)
Session Topic : Surgical Techniques for LDLT
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 3F-1

Hepatic Artery - Microanastomosis, Multiple Hepatic Artery, Exceptional Cases

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Arterial anastomosis in liver transplantation, especially in live donor liver transplantation(LDLT) is the most important procedure for graft and recipient's survival and long term outcome. But initial results of early experiences were very poor, then microscopic technique was applied to overcome the post-anastomosis failure. And it becomes the standard technique with very good results, less than 1 or 2 percent of arterial thrombosis. Microscope was designed in the late of 16th century, in 1960, it was applied to experimental animals and human with confidential results. And 1n 1992, first arterial anastomosis in LDLT was successfully performed. Microscope provides sufficient magnification up to 10 folds for precise anastomosis. But this technique requires long learning curve. Now a days, as the accumulation of experiences, it is replaced with direct anastomosis under the surgical loopes with similar results. Hepatic arteries are very small, so its anastomosis should be strictly performed with general principles, such as, end-to-end anastomosis, tension-free approximation of both stump, good size-matching, needling through full thickness of arterial wall, avoid slip in of adventitia, etc. arterial anastomosis can be done with single interrupted suture technique or continuous suture technique. Under the microscope, interrupted suture is preferred in general. Hepatic arterial anastomosis is more difficult compared to middle and large sized arterial anastomosis. In donor side, it is smaller, less than 3 mm. with thin and weak wall. Many grafts had multiple arterial stumps. In recipient side, most of arterial stumps were under the pathologic conditions, such as hypertrophy of artery, edematous or

fragile intimal, intramural thrombosis, vascular spasm, direct injury during dissection or preexisting treatment(TACE) So careful evaluation of arterial anatomy during preparation is essential in donor and recipient too. And during recipient operation, hilar structure should be dissected very carefully to minimize arterial injury. Multiple hepatic arteries are more frequent in left lobe grafts than right lobe grafts (45% vs 1%). Grafts which have triple arterial stumps anastomosed in 1% of left lobe grafts. Anastomoses of all possible arterial stumps of graft are suggested with several reasons: it restores grafts original arterial supply, it is difficult to identify the dominant one, minor hepatic artery stump is usually located deeper than dominant stump, multiple anastomoses can be helpful when one stump is accidently thrombosed, patient stump may save the graft. Alternative arterial inflow in recipient side is needed if native hepatic arteries were no available for anastomosis. Various candidates were available, right gastroepiploic artery is most useful and applicable in most cases. About 35% of anastomoses are considered as difficult cases, size discrepancies, poor blood flow from stump, short stump, intimal damage or mural thrombosis, etc. How many hepatic arteries may exist, how many injuries or obstacles is present, how difficult its techniques, all the anastomoses should be performed to save the grafts and patients. So every arterial anastomosis surgeon should be familiar with the careful and refined and meticulous anastomosis techniques.

Keywords: hepatic artery , microscope anastomosis, multiple ateries, live donor liver transplanation, difficult cases

Lecture Code : PG07-S3
Session Name : Postgraduate Course 7 (Liver)
Session Topic : Surgical Techniques for LDLT
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 3F-1

Outflow Reconstruction

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1. Why Outflow Matters in LDLT In liver transplantation, proper blood outflow from the liver graft is critical. The liver requires a smooth flow of blood to function well, and if blood can't exit the liver easily, it causes congestion, where blood pools and damages liver cells. This can lead to liver dysfunction, small-for-size syndrome, and even graft failure. Key veins play a role here: Right Hepatic Vein (RHV): Drains the right posterior and some anterior sections. Middle Hepatic Vein (MHV): Drains most of the anterior section. In right-lobe transplants, the MHV typically stays with the donor, which can cause challenges for outflow in the recipient's graft. If these veins are not reconstructed correctly, parts of the graft may lack drainage and become congested. 2. Challenges in Outflow Reconstruction Outflow reconstruction in LDLT can be complex, especially since the right lobe is often taken and the MHV remains with the donor. To ensure smooth outflow, surgeons need to reconstruct branches of the MHV and RHV. Two important areas to focus on are: Vein Reconstruction: Key branches like V5 and V8 help prevent congestion and should be reconstructed in the recipient's graft. Anatomical Variations: Each liver is different. For example, the accessory inferior right hepatic vein (RIHV), found in 40% of people, drains directly into the IVC. If surgeons overlook these anatomical differences, parts of the graft may experience congestion, increasing the risk of sepsis or liver dysfunction. 3. Key Techniques for Outflow Reconstruction Reconstruction of RHV and MHV Tributaries: The surgeon may need to reconstruct branches of the MHV in the graft, as these drain significant areas. This helps prevent congestion in the anterior liver. Using Various Graft Types: Depending on the vein's location and size, surgeons may use autologous tissue (from the recipient), allografts (from a donor), or synthetic materials like ePTFE. Venoplasty to Widen Veins: Enlarging a vein's opening can ensure smooth blood flow. This can be done directly or with a patch graft to keep the vein stable as the graft grows. 4. Common Complications and Management Complications may arise, such as: Anastomotic Stenosis: This narrowing of the vein junction may restrict blood flow and is often managed with balloon angioplasty. Kinking: When veins fold, blocking flow. A stent can hold the vein open.

Intrahepatic Stenosis: When veins narrow within the liver, stents may be required. Early treatment is essential for better outcomes, as early intervention significantly improves graft survival rates. 5. Optimizing Long-Term Success To prevent complications and ensure long-term success: Prepare Venous Outflow Thoroughly: Techniques like venoplasty can help, as can configuring the IVC opening correctly. Use Patch Grafts Where Needed: These stabilize veins, preventing distortion. Maintain Vein Alignment: Properly aligning veins can prevent bending that obstructs flow. Conclusion Successful LDLT outflow depends on understanding liver anatomy, reconstructing veins carefully, and handling complications quickly. Using these strategies can improve graft function, benefiting both donors and recipients.

Keywords: Outflow, Hepatic vein, Right inferior hepatic vein, Inferior vena cava, MHV

Lecture Code : PG07-S4
Session Name : Postgraduate Course 7 (Liver)
Session Topic : Surgical Techniques for LDLT
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 3F-1

Management for Multiple Bile Ducts and Management of Its Complications

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Living donor liver transplantation is an alternative to deceased donor liver transplantation in the face of insufficient deceased donor liver grafts. Unfortunately, the incidence of biliary complication after living donor liver transplantation is the Achilles' heel of this complex procedure. About one third of the right lobe living donors are having two or more bile duct openings. The site of the division and preserving the maximum blood supply will be of utmost importance to prevent recipients' complications. The techniques of bile duct anastomosis are often overlooked as most senior surgeons will leave the OR after the vascular anastomoses. The two most common biliary complications after living donor liver transplantation are bile leakage and biliary anastomotic stricture. Early treatment with endoscopic and interventional radiological approaches can achieve satisfactory outcomes. If treatment with these approaches fails, the salvage measure for prompt rectification will be surgical revision, which is now rarely performed. Nonetheless, early intervention is important to prevent secondary biliary cirrhosis, which may progress to graft failure.

Keywords: Living donor liver transplantation, right lobe living donors, multiple bile duct, bile leaks, bile duct strictures

Lecture Code : PG08-S1
Session Name : Postgraduate Course 8 (Kidney/Pancreas)
Session Topic : Transplant Pathology
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-1

Clinical Implications of Chronic Allograft Dysfunction

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Introduction: Chronic allograft nephropathy (CAN), though less commonly used, refers to the progressive loss of kidney graft function due to immune and non-immune factors. CAN is now categorized into conditions such as antibody-mediated rejection (ABMR), interstitial fibrosis, and tubular atrophy (IFTA). The key drivers of graft loss include alloimmune responses, primary disease recurrence, non-adherence to immunosuppressive therapy, and non-immune factors such as infections and metabolic disorders. 1. Immunologic Causes of Graft Failure: Immunologic rejection, particularly ABMR and T-cell-mediated rejection (TCMR), is the main cause of long-term graft failure. ABMR is responsible for up to 37% of losses, while TCMR accounts for 6% to 17%. Repeated rejection episodes lead to chronic injury, accelerating interstitial fibrosis and tubular atrophy, the hallmark of chronic graft failure. Non-adherence to medication further exacerbates rejection risks. 2. Role of Antibody-Mediated Rejection (ABMR): ABMR is a critical contributor to CAN, occurring both early and late post-transplant due to the formation of donor-specific antibodies (DSA). C4d-negative ABMR is harder to detect but plays a significant role in late graft failure. DSA monitoring is essential for early detection, although treatments like plasmapheresis and IVIg offer limited long-term success due to ongoing graft damage. 3. Polyomavirus Nephropathy (PVN): PVN, caused by the BK virus, can lead to significant graft injury through chronic inflammation. It is diagnosed through PCR for BKV DNA or immunohistochemistry. Without prompt treatment, PVN can result in irreversible graft damage. 4. Primary Disease Recurrence: Recurrent kidney diseases, such as IgA nephropathy and FSGS, can return after transplantation, contributing to chronic graft injury. The recurrence of the original disease in the transplant poses a major risk for long-term graft survival. 5. Non-Immune Factors: Non-immune factors, including infections, cardiovascular disease, and malignancies, significantly impact graft survival, particularly in older patients. Elderly patients tend to experience fewer immune rejections but suffer from higher rates of non-immune complications. 6. The Complexity of Chronic Allograft Injury: Chronic graft injury, often manifesting as IFTA, results from a combination of immune attacks and non-immune insults like calcineurin inhibitor toxicity and metabolic disorders. Early detection and management of these risk factors are essential to prevent irreversible damage. Conclusion: Chronic allograft nephropathy is a

multifactorial condition requiring a comprehensive approach to both immune and non-immune contributors. Proactive monitoring, patient adherence to therapy, and early intervention are key to improving long-term graft survival.

Keywords: kidney transplantation, chronic allograft dysfunction, ABMR, IFTA, Polyomavirus Nephropathy

Lecture Code : PG08-S2
Session Name : Postgraduate Course 8 (Kidney/Pancreas)
Session Topic : Transplant Pathology
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-1

Non-Immunologic Injury of Allograft Kidneys

Beom Jin Lim
Yonsei University College of Medicine, Republic of Korea

When a pathologist interprets a biopsy of a transplanted kidney, the primary concern is to detect any signs of rejection and perform appropriate grading. Equally important is the accurate diagnosis of non-immunologic injury, as it significantly affects prognosis and management. Non-immunologic injuries commonly encountered in clinical practice include ischemia-reperfusion injury (IRI), drug-induced nephrotoxicity, and chronic allograft injury (excluding that caused by rejection). Clinically, when a biopsy of a transplanted kidney is performed in the case of delayed graft function, abnormal findings due to IRI are often observed. IRI in a transplanted kidney shows features similar to acute tubular injury in native kidneys. More specifically, this includes loss of brush border, apical blebbing, sloughing, non-isometric vacuolization, and cell necrosis of tubular epithelial cells, and is accompanied by tubulointerstitial edema. Acute tubular injury due to IRI must be distinguished from injury caused by rejection. In cases of prominent interstitial inflammation, tubulitis, glomerulitis, peritubular capillaritis, and C4d positivity, the possibility of T cell-mediated or antibody-mediated rejections should be considered. One of the most well-known causes of drug-induced nephrotoxicity is the calcineurin inhibitors. Changes due to calcineurin inhibitors can be observed in the glomeruli, tubules, and arterioles. In the glomeruli, endothelial injury and necrosis can be seen, and thrombotic microangiopathy may occur in severe cases. Isometric vacuolization, epithelial cell necrosis, and microcalcification can be observed in the tubules. In the arterioles, endothelial cell injury, myocyte necrosis, thrombotic microangiopathy, and medial hyalinosis can occur. Interstitial fibrosis is also a characteristic finding of chronic calcineurin inhibitor toxicity. It is also important to consider the possibility of toxicity due to rapamycin (mTOR) inhibitors and drug-induced acute tubulointerstitial nephritis. Approaching kidney transplant biopsies with a comprehensive understanding of both immunologic and non-immunologic injuries empowers clinicians to make informed decisions that enhance patient care and improve transplant outcomes.

Keywords: Biopsy, Transplanted kidney, Non-immunologic injury, Rejection, Nephrotoxicity

Lecture Code : PG08-S3
Session Name : Postgraduate Course 8 (Kidney/Pancreas)
Session Topic : Transplant Pathology
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-1

Chronic ABMR

Wenfang Chen
The first affiliated hospital of Sun Yat-sen University, China

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1. Background of ABMR in transplanted kidney and a brief review of the historical change of ABMR especially those related to chronic lesions. 2. Mophology and Banff grading of chronic ABMR including transplant glomerulopathy, multilayering of the PTC basement membrane and transplant arteriopathy will be presented with electronic changes enphasized. 3. Clinical manifestations and clinicopathological correlation of chronic ABMR.

Keywords: kidney transplantation, antibody mediatd rejection, Banff classification, chronic ABMR, Transplant glomerulopahty

Lecture Code : PG08-S4
Session Name : Postgraduate Course 8 (Kidney/Pancreas)
Session Topic : Transplant Pathology
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-1

Recurrent Primary Glomerulonephritis

MAN-HOON HAN
Kyungpook National University Hospital, Republic of Korea

Recurrent primary glomerulonephritis after kidney transplantation significantly impair the function of the transplanted kidney. Glomerular disease such as focal segmental glomerulosclerosis (FSGS), IgA nephropathy(IgAN), membranoproliferative glomerulonephritis (MPGN), and membranous glomerulonephritis (MGN) are highly prone to recurrence. FSGS, in particular, presents a recurrence rate of approximately 30–60%, with a notably higher risk of recurrence in primary FSGS. Recurrent FSGS can lead to rapid loss of graft function, often manifesting as proteinuria. Early recurrence may occur within 48 to 72 hours post-transplantation, while gradual nephrotic syndrome progression may develop over months or years. In early recurrence, light microscopy may not reveal specific findings, with segmental sclerosis appearing only at later stages. Thus, diffuse podocyte foot process effacement observed in electron microscopy serves as the only early histological marker for recurrent FSGS. Factors such as younger recipient age, severe disease presentation, and a history of FSGS recurrence in a previous graft may be associated with an increased risk of FSGS recurrence. IgAN frequently recurs, occurring in 20–60% of recipients. Clinically, IgAN recurrence mirrors primary IgAN, initially displaying microscopic hematuria, proteinuria, and a gradual decline in renal function. However, characteristic hematuria may not always manifest, with proteinuria often being the sole symptom. Diagnosis is confirmed histologically by the presence of mesangial IgA deposits. Younger recipient age at the time of transplantation, living donor transplants, steroid avoidance, or early steroid withdrawal immunosuppressive regimens are potentially associated with a risk of IgAN recurrence. Recurrent MPGN occurs in 27–65% of kidney transplants and can lead to graft loss in up to 50% of cases. The recurrence rate is significantly higher with second transplants. The recurrence rate of idiopathic membranous glomerulonephritis (MGN) after kidney transplantation is 30–50%, with a direct correlation between PLA2R antibody titers and the risk of recurrence. Recurrent primary glomerulonephritis significantly impacts graft survival, necessitating accurate diagnosis and proactive treatment that takes into account the associated risk factors.

Keywords: Kidney transplantation, Glomerulonephritis, Recurrence, allografts, Pathology

Lecture Code : PG09-S1
Session Name : Postgraduate Course 9 (Basic)
Session Topic : Immune Regulation and Tolerance
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 6F-1

Central and Peripheral Tolerance

Min Kyung Jung
IBS, Republic of Korea

Immune tolerance is a term describing the unresponsiveness of an immune cell to an antigen through exposure to that antigen. Tolerance to self-antigens is a fundamental property of the normal immune system, and failure of immune tolerance can be related to various diseases. Immune tolerance is mainly achieved by both central and peripheral mechanisms targeting T and B cells. Central tolerance is a process in which autoreactive lymphocytes are selectively removed. Despite the role of central tolerance, autoreactive T and B cells may still escape into the periphery. Peripheral tolerance mechanism can inhibit the activation of autoreactive lymphocytes in peripheral sites. Many studies have reported understanding the balance between effector and regulatory compartments in health and disease regarding immune tolerance. In this lecture, basic concepts and recently updated knowledge focusing on T and B cell tolerance will be discussed.

Keywords: Immune tolerance, central tolerance, peripheral tolerance, T cell tolerance, B cell tolerance

Lecture Code : PG09-S2
Session Name : Postgraduate Course 9 (Basic)
Session Topic : Immune Regulation and Tolerance
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 6F-1

CD4+CD25+FoxP3+ Regulatory T Cells

HOKEUN KWON
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Regulatory T cells (Tregs) have emerged as pivotal players in maintaining immune homeostasis and preventing autoimmunity. This lecture will explore the journey of Tregs from their discovery to their current role in immunological research and potential clinical applications in transplantation. Beginning with the historical milestones that shaped our understanding of Tregs, we will review their foundational immunological properties, mechanisms of action, and their role in modulating immune responses. A detailed examination of Classical Tregs will be provided, highlighting their functions, phenotypes, and interactions with other immune cells. This will lead into a discussion on the emerging field of tissue-specific Tregs, which have shown unique adaptations and functions within specific tissue environments. Finally, we will delve into the potential of Tregs in transplantation, focusing on how their immunosuppressive capabilities may contribute to improved graft tolerance and reduced rejection rates. This lecture aims to bridge foundational Treg biology with its translational relevance, providing insights into how Treg modulation could enhance therapeutic strategies in transplantation medicine.

Keywords: Regulatory T cells, FOXP3, Immune homeostasis, Tolerance, transplantation

Lecture Code : PG09-S3
Session Name : Postgraduate Course 9 (Basic)
Session Topic : Immune Regulation and Tolerance
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 6F-1

Other Types of Immunoregulatory Cells

Yeonseok Chung
Seoul National University, Republic of Korea

Immune response-associated inflammation is essential for protecting the host from pathogens; however, when dysregulated, it can lead to significant and often irreversible tissue damage. While inflammatory responses are typically triggered by infection or injury, a variety of autoimmune diseases and cancers can drive chronic inflammation. Persistent exposure to proinflammatory cytokines, such as TNF-α, IL-17, IL-6, and IFN-α, underlies the pathogenesis of autoimmune and inflammatory disorders like rheumatoid arthritis (RA), multiple sclerosis (MS), and systemic lupus erythematosus (SLE). To prevent irreversible tissue damage, an effective anti-inflammatory response is required to mitigate injury and restore immune homeostasis. Several regulatory mechanisms exist to suppress excessive lymphocytic activation and attenuate inflammatory signals, helping to maintain this balance. In addition to the well-characterized role of Foxp3-expressing T regulatory cells (Tregs) in immune regulation, non-Foxp3-expressing cells also contribute significantly to immune tolerance. Notably, regulatory B cells (Bregs), which produce IL-10 and other anti-inflammatory cytokines, play a crucial role in sustaining immune homeostasis. Disruptions in the number or function of Bregs are linked to various immune-related diseases, highlighting their therapeutic potential. Beyond Bregs, several subsets of Foxp3-negative T cells also exert immunoregulatory functions. Furthermore, myeloid-derived suppressor cells (MDSCs) are important contributors to immune suppression in both cancer and autoimmune conditions. This presentation will explore the diverse roles of Foxp3-negative regulatory immune cells in maintaining health and their involvement in disease processes.

Keywords: Breg, Tr1, CD8 Treg, IL-10, IL-35

Lecture Code : PG09-S4
Session Name : Postgraduate Course 9 (Basic)
Session Topic : Immune Regulation and Tolerance
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 6F-1

PD-1 and Immune Checkpoint Receptors

Su-Hyung Park
KAIST, Republic of Korea

T cell exhaustion is a critical phenomenon in immune regulation, commonly observed in chronic infections and cancer, where prolonged antigen exposure impairs T cell function. This lecture will explore the mechanisms underlying T cell exhaustion, focusing on the role of Programmed Cell Death Protein 1 (PD-1) and other immune checkpoint receptors. PD-1, a key inhibitory receptor, interacts with its ligands, PD-L1 or PD-L2, transmitting signals that suppress T cell activity and promote an exhausted phenotype. This state is marked by reduced cytokine production, diminished cytotoxicity, and a gradual loss of proliferative capacity, rendering T cells less effective against persistent antigens. Furthermore, this lecture will examine how immune checkpoint inhibitors, particularly anti-PD-1 and anti-PD-L1 antibodies, can rejuvenate exhausted T cells and restore immune function. We will integrate recent research on the mechanisms driving T cell exhaustion and discuss therapeutic strategies aimed at reversing this state to improve immune responses. However, challenges remain, such as the limited efficacy of anti-PD-1 therapy in many cancer types, underscoring the need for refined and personalized treatment approaches. In conclusion, this lecture will provide insights into the future of immunotherapy, focusing on strategies to overcome T cell exhaustion and enhance immune responses for better disease control and patient outcomes.

Keywords: T cell exhaustion, immune checkpoint receptor, PD-1, CTLA-4, T cell dysfunction

Lecture Code : PG10-S1
Session Name : Postgraduate Course 10 (Infection)
Session Topic : Infection Control Issue at Hospital and Community
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-2

Infection Control in Transplant ICU

Su Jin Jeong
Yonsei University College of Medicine, Republic of Korea

Infection control in transplant ICU Advancements in surgical techniques, perioperative care, and immunosuppressive treatments have improved the quality of life and long-term survival for solid organ transplant (SOT) recipients. However, infection is a significant complication that can occur in SOT recipients and can impact transplant outcomes, and even be life-threatening. To prevent postoperative infections, SOT recipients are given antibacterial, antifungal, and antiviral prophylaxes. The most common cause of infection in SOT recipients in the first month after transplantation is nosocomial bacterial infections. Additionally, recipients of liver, pancreas, and intestinal transplants are particularly at risk for fatal fungal infections, primarily caused by Candida species, which may occur simultaneously with bacterial infections. The treatment of SOT recipients with life-threatening infections has become increasingly complex due to the rising prevalence of multidrug-resistant organisms. Multidrug-resistant Gram-negative bacteria account for approximately 14% of organisms isolated in bloodstream infections after SOT. Early diagnosis of infections and prompt initiation of appropriate antimicrobial treatments are essential in managing patients before and after transplantation.

Keywords: Infections, ICU, transplant recipients, managment, MDR organisms

Lecture Code : PG10-S2
Session Name : Postgraduate Course 10 (Infection)
Session Topic : Infection Control Issue at Hospital and Community
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-2

Infection Control for Multidrug-Resistant Organism

SUN YOUNG CHO
Samsung Medical Center, Republic of Korea

Lecture Title: Infection Control of Multidrug-Resistant Organisms in Transplant Patients Abstract: Transplant patients are particularly vulnerable to infections due to the immunosuppressive therapies they undergo. Infections caused by multidrug-resistant organisms (MDROs) have become a major challenge, posing significant risks in post-transplant care. MDROs, such as methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant Enterococcus (VRE), and carbapenem-resistant Enterobacteriaceae (CRE), can severely complicate treatment by limiting the effectiveness of available antibiotics, resulting in infections that are difficult to manage. These infections are associated with higher mortality rates, extended hospitalizations, and increased healthcare costs. The aim of this lecture is to provide healthcare professionals with crucial insights into strengthening infection control efforts, thereby improving outcomes for transplant patients. This lecture will cover the latest epidemiological trends, resistance mechanisms, and the key transmission pathways of MDROs within healthcare settings, particularly in transplant units. A key focus will be on evidence-based infection control practices that have proven effective in minimizing MDRO transmission. These practices include strict hand hygiene adherence, rigorous environmental cleaning, the use of contact precautions, and isolating infected or colonized patients to prevent cross-transmission. Additionally, we will discuss the role of antimicrobial stewardship programs in optimizing antibiotic use to reduce the selection pressure that drives resistance.

Keywords: MDRO, Transmission, Transplant, Infection , Control

Lecture Code : PG10-S3
Session Name : Postgraduate Course 10 (Infection)
Session Topic : Infection Control Issue at Hospital and Community
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-2

Safe Life After Transplantation at Home and Community

Kyungmin Huh
Samsung Medical Center, Republic of Korea

Infection is an important complication after solid organ transplantation, causing a substantial burden of morbidity and mortality. Its risk is highest during the immediate post-transplant period but remains elevated long after transplantation. While some infectious pathogens become reactivated from lifelong latency after the initial infection, many pathogens are acquired exogenously. Thus, exposure in daily life and various activities may increase the risk of opportunistic infection. However, limiting such activity may not be an optimal solution, as an important goal of transplantation is to provide the patients with a life as normal as possible, free from the restriction that came from end-stage organ damage. Therefore, it is of paramount importance for healthcare providers to guide the recipients to minimize the risk of exposure to infectious pathogens while maintaining the fullest life. Most exogenous infectious agents are acquired by either one or more of the following routes: direct contact, inhalation, ingestion, and sexual contact. Frequent hand washing is recommended to prevent infections transmitted by direct contact. Either washing with soap or alcohol-based rub is an acceptable measure, while visible soiling should be washed with water. Gloves or other barrier protection should be employed when contact with heavily contaminated materials is anticipated. The recent COVID-19 pandemic greatly improved our understanding of preventive measures against respiratory infections. High-risk situations such as close contact with persons with respiratory illness, certain construction or landscaping, and farming should be avoided whenever necessary. If complete avoidance is not possible, appropriate protective measures such as respirators should be used. Avoidance of crowded areas during increased activity of respiratory infections (e.g., influenza, COVID-19) is recommended. Mask-wearing is another useful protective measure. Attention should be paid to water quality. In areas with accessible tap water, advisory from local authorities may necessitate boiling water before consumption. Well water without regular screening should be avoided at best; if not possible, it should be boiled, or alternative sources of water should be considered. Consumption of unpasteurized milk or dairy products should be avoided. Meat should be cooked sufficiently, and care should be taken to avoid cross-contamination. Patients should be encouraged to keep their pets healthy by appropriate feeding, regular checkups, and vaccinations. Cleaning feces or bird cages is better left to family

members; if not possible, the use of gloves and proper hand washing should be employed. Some species of pets need specific caution. Safer sex practices, including the use of latex condoms, are recommended.

Keywords: infection, safe life, community, counseling, education

Lecture Code : PG11-S1
Session Name : Postgraduate Course 11 (Liver)
Session Topic : Pitfall of LDLT: Biliary Complication
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 3F-1

Incidence and Risk Factors of Bile Duct Complication and Impact on Outcomes After LDLT

Yuji Soejima
Shinshu University, Japan

Biliary complications are common after living donor liver transplantation (LDLT) and can significantly impact graft function and patient outcomes. This lecture will provide an overview of the types of biliary complications seen post-LDLT, including anastomotic stricture, bile leaks, and cholangitis. We will discuss the risk factors associated with these complications, such as graft type, surgical technique, and ischemia time. Additionally, the presentation will cover diagnostic approaches, management strategies, and the impact of biliary complications on long-term graft survival. By understanding the pathophysiology and best practices for managing these complications, clinicians can improve post-transplant care and reduce the burden of these adverse events.

Keywords: Biliary complication, Anastomotic strictures, Bile leak, Cholangitis, Graft type

Lecture Code : PG11-S2
Session Name : Postgraduate Course 11 (Liver)
Session Topic : Pitfall of LDLT: Biliary Complication
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 3F-1

Surgical Techniques to Prevent Biliary Complication in LDLT

Tsan-Shiun Lin
Kaohsiung Chang Gung Memorial Hospital, Taiwan

Technical Refinements to Reduce the Early Biliary Complication in Living Donor Liver Transplantation Tsan-Shiun, Lin, Yeong-Sing, Lee, Khee-Ghee Tan, Stephen Matthew B. Santos, Chih-Che, Lin, Shih-Ho Wang, Chee-Chien Yong, Wei-Feng Li, Yu-Fan Cheng, Chih-Chi Wang, Chao-Long Chen Abstract: Background: This study aimed to evaluate the biliary outcomes of LDLTs in patients undergoing microsurgical biliary reconstruction with continual technical refinements. Materials and Methods: This observational cohort study analyzed data was conducted from 2006 to 2022. Microsurgical biliary reconstruction was performed using various refinements, including selective biliary stent insertion, ipsilateral (anatomical) bile duct anastomosis, use of a figure-of-8 suture over the junction of the graft and recipient bile ducts, and centralization techniques for size discrepancies greater than 2 to 1. Comparison and evaluation of early BC within one year post transplant was performed. Results: 1780 patients (including 1563 adults and 217 paediatric patients) underwent microsurgical biliary reconstruction in LDLTs at KCGMH between 2006 and 2022. The donor grafts comprised 1109 right liver grafts and 671 left liver grafts. Of the grafts, 23.1% had multiple bile ducts and 16.1% had bile duct sizes less than 3 mm. Duct-to-duct anastomosis was performed in most cases 1417 (79.6%), while 363 (20.4%) Roux-en-Y hepaticojejunostomies (RY HJ) was performed. The overall early BCs rate was 10% and notable improvements were observed, decreasing from 10.35% between 2006 and 2021 to 6.5% by 2022. Early BS comprised the most part of 6.1% as compared to 2.7% one year after transplantation. Stent insertion in selected cases, ipsilateral anastomosis, and the figure-of-8 suture technique significantly reduced early BCs. Although centralization technique showed promising results, its effect was not statistically significant. Conclusions: Continual technical refinements in MBR can contribute to a substantial reduction in early BCs following LDLT, ultimately leading to improved patient outcomes.

Keywords: living donor liver transplantation, microsurgical biliary reconstruction, early biliary complication, biliary stricture

Lecture Code : PG11-S3
Session Name : Postgraduate Course 11 (Liver)
Session Topic : Pitfall of LDLT: Biliary Complication
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 3F-1

Management of Biliary Complication in LDLT - ERCP

Woo Hyun Paik
Seoul National University Hospital, Republic of Korea

Management of Biliary Complication in LDLT -ERCP Woo Hyun Paik, MD, PhD Department of Internal Medicine and Liver Research Institute, Seoul National University College of Medicine, Seoul National University Hospital, Seoul, Korea 101 Daehak-ro, Jongno-gu, Seoul, 03080, Korea Living donor liver transplantation (LDLT) is widely performed for end-stage liver disease in Asia, particularly in Korea. Major improvements in treatment outcomes have been achieved over the last three decades, however, biliary complications, including biliary anastomotic or non-anastomotic strictures, bile leaks, and biliary cast syndrome, remain significant causes of morbidity in LDLT recipients.[1-3] Biliary anastomotic stricture is the most common complication after liver transplantation, with a higher incidence in LDLT.[4] Generally, an endoscopic approach with ERCP is attempted first owing to its less invasive and more physiologic nature. However, there is about a 20% failure rate, requiring multidisciplinary approaches including radiologic intervention and surgery for the palliation of biliary anastomotic stricture.[1] Novel techniques using self-expandable metal stents, magnetic compression anastomosis or single-operator cholangioscopy have been introduced to improve the success rate of ERCP.[5-7] Bile leaks are another complication after LDLT, with an incidence rate of approximately 14%. Bile leaks can occur not only in recipients but also in donors. Notably, bile leaks are the most significant predictor of biliary stricture after LDLT.[8] Multiple ducts for anastomosis are also associated with bile leaks. Endoscopic management may be attempted for bile leaks; however, if the leakage site is too large, endoscopic management becomes challenging. Biliary cast syndrome is rare but frequently recurs, often requiring multiple interventions through endoscopic and percutaneous approaches. Acute cellular rejection appears to be a risk factor for early relapse of biliary cast syndrome.[3]
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2020; 53(3): 261-5. 5. Lim C, Ng J, Sarraf B, et al. Safety and efficacy of Kaffes intraductal self-expanding metal stents in the management of post-liver transplant anastomotic strictures. World J Transplant 2024; 14(2): 91081. 6. Jang SI, Cho JH, Lee DK. Magnetic Compression Anastomosis for the Treatment of Post-Transplant Biliary Stricture. Clin Endosc 2020; 53(3): 266-75. 7. Zhang W, Sun H, Dong D, Li Y. Safety and feasibility of a novel recanalization technique using guidewire puncture under cholangioscopy for complete biliary stricture after liver transplantation. Sci Rep 2023; 13(1): 4874. 8. Hassouneh R, Beran A, Rosenheck M, et al. Risk factors for biliary strictures and leaks after living-donor liver transplantation: a systematic review and meta-analysis. J Gastrointest Surg 2024.

Keywords: Endoscopy, Adverse event, Treatment outcome, Transplantation, ERCP

Lecture Code : PG11-S4
Session Name : Postgraduate Course 11 (Liver)
Session Topic : Pitfall of LDLT: Biliary Complication
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 3F-1

Management of Biliary Complication in LDLT - Intervention

JOON HO KWON
Severance Hospital, Republic of Korea

Management for Biliary complication after LDLT 1. Stenosis/occluion - Large bore catheter insertion/ plastic stent insertion - Sharp recanaliization - plastic guided recanalization - CT guided recanalizatoin - Biliary-enteric neoanastomosis - Rendezvous technique 2. Leakage - PTBD catheter insertion - covered stent insertion - Foley catheter insertion

Keywords: Stenosis, Occlusion, Leakage, PTBD, Stent

Lecture Code : PG10-S2
Session Name : Postgraduate Course 10 (Infection)
Session Topic : Infection Control Issue at Hospital and Community
Date & Time, Place : November 14 (Thu) / 13:00-14:30 / Room 5F-2

Infection Control for Multidrug-Resistant Organism

SUN YOUNG CHO
Samsung Medical Center, Republic of Korea

Lecture Title: Infection Control of Multidrug-Resistant Organisms in Transplant Patients Abstract: Transplant patients are particularly vulnerable to infections due to the immunosuppressive therapies they undergo. Infections caused by multidrug-resistant organisms (MDROs) have become a major challenge, posing significant risks in post-transplant care. MDROs, such as methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant Enterococcus (VRE), and carbapenem-resistant Enterobacteriaceae (CRE), can severely complicate treatment by limiting the effectiveness of available antibiotics, resulting in infections that are difficult to manage. These infections are associated with higher mortality rates, extended hospitalizations, and increased healthcare costs. The aim of this lecture is to provide healthcare professionals with crucial insights into strengthening infection control efforts, thereby improving outcomes for transplant patients. This lecture will cover the latest epidemiological trends, resistance mechanisms, and the key transmission pathways of MDROs within healthcare settings, particularly in transplant units. A key focus will be on evidence-based infection control practices that have proven effective in minimizing MDRO transmission. These practices include strict hand hygiene adherence, rigorous environmental cleaning, the use of contact precautions, and isolating infected or colonized patients to prevent cross-transmission. Additionally, we will discuss the role of antimicrobial stewardship programs in optimizing antibiotic use to reduce the selection pressure that drives resistance.

Keywords: MDRO, Transmission, Transplant, Infection , Control

Lecture Code : PG12-S1
Session Name : Postgraduate Course 12 (Kidney/Pancreas)
Session Topic : Transplant Immunologic Tests
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-1

Assessing Donor/Recipient HLA Compatibility Using NGS Based HLA Typing

In Hwa Jeong
Dong-A University Hospital, Republic of Korea

Successful kidney transplantation relies on precise donor-recipient HLA matching. Conventional HLA typing methods provide valuable HLA information, yet often involve ambiguities. Next-generation sequencing (NGS)-based HLA typing has emerged as a powerful tool, offering higher resolution and greater accuracy. This presentation will compare conventional HLA typing methods with NGS-based approaches, emphasizing the limitations of traditional methods, such as lower resolution and failure to capture rare alleles. NGS-based typing, by contrast, delivers ultra-high resolution, allowing for more detailed allele-level analysis, which is crucial for improving donor-recipient compatibility assessments and has been associated with higher kidney transplantation success rates. A key advantage of NGS-based HLA typing is its ability to establish eplet compatibility, moving beyond traditional antigen matching. Eplets offer a refined method for assessing potential immunological compatibility, and by identifying eplet mismatches, transplant teams can minimize the risk of antibody-mediated rejection and improve clinical outcomes. Additionally, high-resolution HLA typing aids in the identification of donor-specific antibodies (DSAs), which are linked to graft rejection. By specifying DSAs more precisely through detailed HLA allele identification, NGS technology enables a more individualized approach to immunosuppression and post-transplant monitoring. Lastly, NGS-based typing has revolutionized the discovery of novel HLA alleles that were often missed by conventional methods. Identifying these alleles is vital for enhancing donor registries and improving matching for patients from underrepresented populations. In conclusion, the transition to NGS-based HLA typing presents significant advances in kidney transplantation, offering higher resolution for HLA matching, enhanced eplet compatibility, precise DSA identification, and the discovery of novel alleles. This presentation will delve into these advancements and their clinical relevance in modern transplantation.

Keywords: HLA, NGS, DSA, Eplet, Novel allele

Lecture Code : PG12-S2
Session Name : Postgraduate Course 12 (Kidney/Pancreas)
Session Topic : Transplant Immunologic Tests
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-1

New Insights Into HLA-DQ Compatibility

Anat Tambur
Northwestern University , United States

In this presentation we will review different approaches to study HLA-DQ compatibility ranging from Molecular Mismatch Load (MML) through newer insights stemming from interrogating unique transplant cohorts, specifically those recipients who received an organ transplantation from a donor with two HLA-DQ mismatches, but de-novo donor specific antibodies were developed only against one of those mismatches – 2MM1DSA. We will further review the divergence of different HLA antigens over evolution and how these events have impacted the immunogenicity of different HLA-DQ mismatches. Lastly, we will discuss the value of obtaining information about the overall signature of the recipient's HLA DQ antibodies to follow Antibody Recognition Patterns and identification of regions of interest within the HLA DQ molecule that serves as targets for HLA antibody binding (epitopes).

Keywords: HLA-DQ , Epitope, Antibody, Transplant , Kidney

Lecture Code : PG12-S3
Session Name : Postgraduate Course 12 (Kidney/Pancreas)
Session Topic : Transplant Immunologic Tests
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-1

Detection of Pathogenc Allo-Antibody-Beyond HLA-DSA IgG

Hye Eun Yoon
Incheon St. Mary's hospital, The Catholic University of Korea, Republic of Korea

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Donor-specific anti-HLA antibodies (DSAs) are the key initiator of antibody-mediated rejection and the dominant cause of poor allograft outcome in kidney transplantation. The introduction of single-antigen bead assay has enabled detection of the presence of DSA and improved the immunologic risk assessment of kidney transplant recipients. However, not all DSAs are harmful to allograft. HLA-DSAs induce a wide spectrum of injuries, that range from the absence of pathologic lesions to subclinical process to acute antibody-mediated rejection with early allograft loss. Therefore, delineating the characteristics of DSAs that confer pathogenesis is one of the unmet needs in clinical practice. Current risk stratification is based on HLA-DSA characteristics, including antibody specificity, HLA class, and strength. In recent years, complement binding assays have been developed to assess the ability of DSAs to activate the complement cascade, with the hypothesis that complement binding DSAs are more pathogenic to the allograft than non-complement binding DSAs. Recent literature also supports a role for HLA-DSA IgG subclass composition in discriminating distinct patterns of antibody-mediated injury. In this session, we will review the clinical relevance of HLA-DSA characteristics, complement dependent assays and IgG subclass to predict transplant outcomes. Through the interpretation of conflicting results, the current role and utility of detecting pathogenic allo-antibodies in kidney transplantation will be discussed.

Keywords: donor-specific antibody , kidney transplantation , antibody-mediated rejection , complement assay , IgG subclass

Lecture Code : PG13-S1
Session Name : Postgraduate Course 13 (Basic)
Session Topic : Immunology of Transplant Rejection
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 6F-1

Mechanisms of Transplant Rejection

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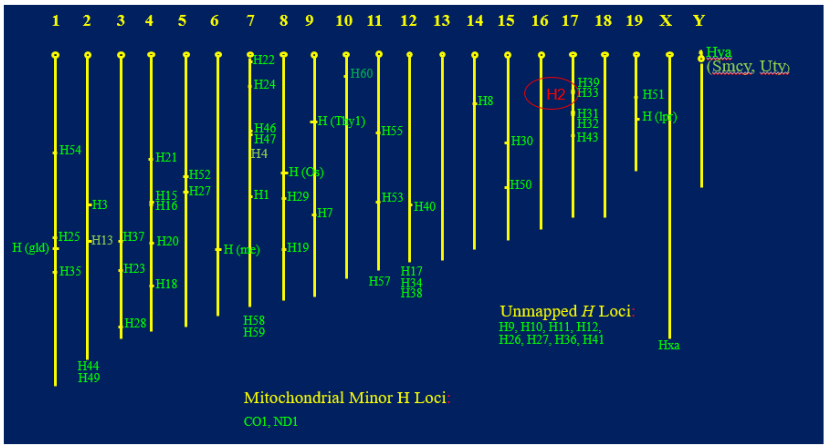
After allogeneic transplantation is performed, T cells that recognize mismatched allogeneic antigens (named histocompatibility antigens) are activated. Particularly, activated allo-reactive CD8 T cells damage the antigen-bearing cells and tissues, resulting in the graft rejection. Histocompatibility antigens are polymorphic proteins encoded by genes designated H in mouse. In particular, H2 genes encode proteins responsible for peptide presentation to T cells, which are known as major histocompatibility complexes (MHCs), H2-K, D, and L for class I, and H2-A and E for class II molcules. In human, HLA locus encompasses HLA-A, B, and C for class I, and HLA-DP, DQ, and DR class II MHC genes. The other histocompatibility (H) antigens are minor H antigens. Mismatch of MHCs between donor and recipient induces strong allo-responses, and the strong allo-response is ascribed to high frequency of the reactive T cells in naïve pool, more than 10-fold higher frequenicies compared to those of T cells reactive to a nominal foreign viral antigen. Minor H antigen loci are spread across whole chromosomes. Minor H antigens are reduced to a short processed peptide bound to specific MH class I and II molecules, and thereby, induce CD8 and CD4 T cell responses, respectively. Simple amino acid change in the MHC-presenting peptides can establishe self vs non-self discrimination, and evokes T cell allo-response. With the advance in genome sequencing and identification of MHC-bound peptides, indentification of minor H antigens is growing. T cells reactive to minor H antigens are similar to norminal foreing viral peptide, in terms of the frequencies in naïve pool, and the TCR diversity. But not all minor H antigens are equal, establishing immune hierarchy among minor H antigens. A dominant minor antigen H60, for instance, takes 10 to 25 % of CD8 T cells in B6 anti-BALB.B setting (H2-matched but background gene-mismatched allogenenic transplantation setting). However, the immune hierarchy can change, and tisssue distribution of minor H antigens affects the dominance. Extents of CD8 T cell responses to minor H antigens depend on the presence or absence of concomitant CD4 T cell activation (called CD4 help). The CD4 help determines generation of memory and non-responsiveness of the CD8 T cell. The CD4 helper-deficient CD8 T cells becomes exhausted, unable to clear the specific antigen-bearing allogeneic cells. The lessons learned from mouse models can be extrapolated to human allo-responses.

Keywords: Major histocompatibility antigen, minor histocompatibility antigen, CD8 T cell , allo-response, Dominance

Mouse histocompatibility loci.png

- H2: Major Histocompatibility Locus
- The Rest: Minor Histocompatibility Loci



Mouse histocompatibility loci.png

Chr.	Name/ Gene	MHC Restriction	Peptide	Why antigenic?
10	H60/RAE	H2-K^b	LTFNYRNL	One allele only expressed
3	H28/nov.cDNA	H2-K^b	ILENFPRL	One allele only expressed
9	B6^{dom}(H7)/unkn	H2-D^b	KAPDNRETL	Amino acid change defines allele
2	H13/nov.cDNA	H2-D^b	SSVVGVWYL	" " " " "
2	H3/nov.Zfp 106	H2-D^b	ASPCNSTVL	" " " " "
7	H47/nov.cDNA	H2-D^b	SCILLYIVI	" " " " "
7	H4/EMP3	H2-K^b	SGIVYIHL	" " " " "
Y	HY/Kk/Smcy	H2-K^k	TENSGKDI	Divergt Smcy/Smcx sequences
Y	HY/Db/Uty	H2-D^b	WMHHNMDLI	Divergt Uty/Utx sequences
Y	HY/Db/Smcy	H2-D^b	KCSRNRQYL	Divergt Smcy/Smcx sequences
Y	HY/Ab/Dby *	H2-A^b	NAGFNSNR -ANSSRSS	Divergt Dby/Dbx sequences
Y	HY/Ek/Dby *	H2-E^k	REEALHQFRS -GRKPI	Divergt Dby/Dbx sequences

*MHC Class II restricted epitopes

Lecture Code : PG13-S2
Session Name : Postgraduate Course 13 (Basic)
Session Topic : Immunology of Transplant Rejection
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 6F-1

T Cells and Transplant Rejection

Sang-Jun Ha
Yonsei University, Republic of Korea

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1. Introduction to Transplantation Rejection Transplantation rejection occurs when the immune system identifies the transplanted tissue or organ as foreign and initiates an immune response. T cells, a type of adaptive immune cell, play a central role in mediating rejection by recognizing non-self antigens presented by donor tissues. 2. Role of T Cells in Transplant Rejection T Cell Subsets in Rejection:CD4+ Helper T cells (Th cells) Recognize donor MHC class II molecules and recruit other immune cells by secreting cytokines (e.g., IL-2, IFN-γ). Help activate CD8+ T cells and B cells, enhancing the immune response. CD8+ Cytotoxic T cells (CTLs) Recognize donor MHC class I molecules on graft cells. Directly kill graft cells through perforin and granzyme release. T Cell Activation Pathways: Direct recognition: T cells recognize intact donor MHC molecules on the surface of donor antigen-presenting cells (APCs). Indirect recognition: T cells recognize donor antigens processed and presented by recipient APCs. 3. Types of Transplant Rejection Hyperacute Rejection: Occurs within minutes to hours due to pre-existing antibodies against donor antigens (e.g., ABO or HLA mismatches). T cells are not directly involved. Acute Rejection: Occurs days to weeks after transplantation. Mediated by both CD4+ and CD8+ T cells, which attack donor cells and recruit other immune cells. Cytokines released by Th cells enhance inflammation and tissue damage. Chronic Rejection: Develops months to years post-transplant. Characterized by persistent low-grade inflammation driven by T cells and other immune components, leading to fibrosis and vascular injury. 4. Immunosuppressive Therapy and T Cell Modulation Immunosuppressive drugs aim to inhibit T cell activation and proliferation to prevent rejection. Calcineurin inhibitors (e.g., cyclosporine, tacrolimus) block IL-2 production. mTOR inhibitors (e.g., sirolimus) inhibit T cell proliferation. Corticosteroids reduce cytokine production and inflammation. Regulatory T cells (Tregs) are also being explored to promote tolerance and suppress immune responses to grafts. 5. Conclusion Understanding the role of T cells in transplantation rejection helps refine therapeutic strategies to balance immune suppression and tolerance. Advances in immunosuppressive therapies and emerging approaches, like Treg therapy, offer hope for better transplant outcomes with fewer side effects.

Keywords: T cells, Transplantation rejection, Direct and indirect recognition, Acute rejection, Immunosuppressive therapy

Lecture Code : PG13-S3
Session Name : Postgraduate Course 13 (Basic)
Session Topic : Immunology of Transplant Rejection
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 6F-1

Antibodies and Transplant Rejection

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Antibody-mediated rejection is the most important cause of graft loss under the current immunosuppressive regimens. Both donor-specific anti-HLA antibodies and non-HLA antibodies participate in antibody-mediated rejection. Furthermore, various immune cells, such B cells, T cells, and NK cells play cooperative roles in inudcing pathogenic antibodies or antibody-mediated rejection. Mechanisms of acute and chronic antibody-mediated rejection will be discussed based on the current Banff criteria of antibody-mediated rejection.

Keywords: antibody, B cells, NK cells, T cells, rejection

Lecture Code : PG14-S1
Session Name : Postgraduate Course 14 (Pathology)
Session Topic : Graft-Versus-Host Disease and Malignancy Associated With Solid Organ Transplantation
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-2

GI and Liver Biopsies for Evaluation of Graft-Versus-Host Disease

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Graft versus host disease (GVHD) occurs when engrafted donor immune cells recognize and attack the recipient's tissue. Most GVHDs develop in the context of allogenic bone marrow or hematopoietic stem cell transplantation but it can rarely occur after solid organ transplantation, especially for liver transplantation. GVHD typically involves the gastrointestinal (GI) tract, liver, skin, and bone marrow. Since signs and symptoms are usually nonspecific, the diagnosis of GVHD is often delayed and relies on biopsy of affected organs. Among the frequently affected organs, the GI tract, and liver are relatively easy targets for biopsies. In the GI tract, typical histologic features of GVHD include increased epithelial or cryptal apoptosis, crypt dropout in the background of mild lymphocytic infiltration. If those typical histologic features are observed in the presence of other organ involvement, such as skin GVHD, the diagnosis is relatively easy. However, the diagnosis of isolated GI GVHD should be made with caution. Since increased cryptal apoptosis can be observed in cytomegaloviral infection, mycophenolate mofetil-associated colitis, and ischemic colitis, those mimickers should be reasonably excluded. When GVHD involves the liver, bile duct epithelium is the main target of donor leukocyte-mediated injury. Thus, interlobular bile duct damage is the key finding of liver GVHD and is accompanied by dilatation, flattening, vacuolization, apoptosis, and intraepithelial lymphocytic infiltration of biliary epithelium. Portal inflammation is typically mild and canalicular cholestasis can be observed in hepatic lobules. Similar to the diagnosis of GI GVHD, the diagnosis of isolated liver GVHD should be made with caution and should be discriminated from distal bile duct obstruction, ascending cholangitis, and cholestatic drug-induced liver injury. Because GVHD carries high mortality without appropriate management, accurate and timely diagnosis are important. High index of suspicion and active discussion with responsible pathologists are essential for proper management of patients involved by GVHD.

Keywords: graft versus host disease, gastrointestinal tract, liver, pathology

Lecture Code : PG14-S2
Session Name : Postgraduate Course 14 (Pathology)
Session Topic : Graft-Versus-Host Disease and Malignancy Associated With Solid Organ Transplantation
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-2

Graft-Versus-Host Disease Associated With Solid Organ Transplantation; Laboratory Medicine Perspective

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Graft-versus-host disease is not limited to hematopoietic stem cell transplantation but also occurs as a serious complication in solid organ transplantation (SOT). In GVHD the donor-derived immune cells, especially T cells, recognize the recipient tissue/organ as foreign and elicits an immune response. While its occurrence is rare in SOT compared to HSCT, its high mortality rate requires clinical concern. Early and accurate diagnosis is crucial in managing GVHD and preventing graft loss and undesired clinical outcomes for which laboratory medicine provides pivotal evidence for diagnosis. Key tests include blood cell counts, liver function tests, bilirubin levels, serum albumin, electrolyte levels etc. Elevation of inflammatory markers such as C-reactive protein and cytokine levels in absence of infection can help assess the severity of the inflammatory response triggered by donor T cells. Therapeutic drug monitoring is critical when using immunosuppression regimen including calcineurin inhibitors. Molecular diagnostics are especially useful for confirming GVHD. Although histopathological analysis are often definitive, invasive procedures are not always an option. HLA typing and chimerism analysis are useful for early determination of GVHD, effectively reducing delay in diagnosis and prompt treatment, possibly improving the clinical outcome. In certain solid organ transplantations where HLA typing is not mandatory, it is often overlooked during pre-transplantation evaluation. Ex post evaluation using HLA typing and chimerism analysis is often time-consuming during critical episodes of GVHD, of which transplantation programs other than kidney and pancreas easily dismiss during pre-transplantation evaluation. Laboratory medicine plays an integral role in the early detection, diagnosis, and monitoring of GVHD in solid organ transplantation especially when clinically apparent signs are missing. The ability to identify early signs of GVHD through laboratory tests and molecular diagnostics, as well as manage treatment responses and monitor for complications, is critical in improving patient outcomes in this rare but life-threatening condition.

Keywords: GVHD, HLA, Chimerism, Laboratory, SOT

Lecture Code : PG14-S3
Session Name : Postgraduate Course 14 (Pathology)
Session Topic : Graft-Versus-Host Disease and Malignancy Associated With Solid Organ Transplantation
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-2

Skin Cancer Associated With Solid Organ Transplantation

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Solid organ transplant recipients (SOTRs) are at increased risk for the development of skin cancer compared with the general population. Thus, multidisciplinary team monitoring and management are required for SORTs population. Skin cancer will develop in more than half of SOTRs during long-term follow up period, most often non-melanoma skin cancer such as basal cell carcinoma or squamous cell carcinoma. Melanoma and rarer cutaneous malignant neoplasms, such as Merkel cell carcinoma and Kaposi sarcoma, are also more common in SOTRs. A multidisciplinary effort at skin cancer screening and patient identification is invaluable to prevent skin cancer-related risk in this population of patients. Reduction in immunosuppressive therapies and surgical procedures are effective treatment options, and another systemic therapy including immune checkpoint inhibitors and G protein-coupled receptor inhibitors are possible therapeutic options when traditional treatment approaches are not feasible. Checkpoint inhibitor therapy, however, comes with the risk of allograft rejection. Some viruses, UV radiation exposure, and immunosuppression are associated with the development of skin cancer in SOTRs. Certain high-risk subgroups may benefit from increased skin surveillance, and treatment with mammalian target of rapamycin inhibitors could be effective for melanoma chemoprevention in the transplant population. With a growing and aging SOTR population, it is essential that SOTRs have support from dermatologists and non-dermatologists alike in skin cancer prevention and treatment.

Keywords: Skin cancer, Solid organ, transplantation, SORT, immunosuppression

Lecture Code : PG14-S4
Session Name : Postgraduate Course 14 (Pathology)
Session Topic : Graft-Versus-Host Disease and Malignancy Associated With Solid Organ Transplantation
Date & Time, Place : November 14 (Thu) / 15:00-16:30 / Room 5F-2

Post-Transplant Lymphoproliferative Disorder

Sun Och Yoon
Yonsei University College of Medicine, Republic of Korea

The 5th edition of the WHO Classification introduces updates to the categorization and diagnostic criteria for posttransplant lymphoproliferative disorders (PTLD), now classified under the broader category of "Lymphoid proliferations and lymphomas associated with immune deficiency and dysregulation." These updates reflect emerging knowledge on immune deficiency settings and advances in immunotherapies. Under this framework, PTLD is categorized into three primary groups: hyperplasias, lymphoproliferative disorders, and lymphomas. Hyperplasias include follicular hyperplasia, infectious mononucleosis-like hyperplasia, plasmacytic hyperplasia, and other types of hyperplasia. Lymphoproliferative disorders consist of polymorphic lymphoproliferative disorder and EBV-positive mucocutaneous ulcer. Lymphomas are categorized based on the criteria for specific lymphoma subtypes, with diffuse large B-cell lymphoma being the most common. EBV status is critical in diagnosing PTLD. Both EBV-positive and EBV-negative cases occur, and clinical correlation is therefore essential to confirm the connection to posttransplant. The revised nomenclature is standardized based on the name of the histological lesion, the presence or absence of oncogenic viruses, and the clinical/immunodeficiency setting. For example, "Infectious mononucleosis -like hyperplasia, EBV+, posttransplant setting" replaces "Non-destructive PTLD." PTLD epidemiology varies by transplant type. After allogeneic hematopoietic stem cell transplantation, the incidence ranges from 0.5% to 17%, with more than 95% of cases occurring early (within 6–12 months) and linked to EBV. PTLD manifests as either nodal involvement or a fulminant course. For solid organ transplantation, PTLD incidence ranges from 1.5% to 20%, with 30–40% occurring early (within the first year) and 60–70% later. About 60% of cases are EBV-associated. Adenoid/tonsil and lymph node involvement is common, while extranodal involvement occurs in 60–90% of cases. This lecture will explore the pathological characteristics of posttransplant-related lymphoproliferative disorders, aligning with the 5th edition WHO updates.

Keywords: posttransplant lymphoproliferative disorders, WHO classification, pathology, nomenclature

Lecture Code : CC01-S1
Session Name : Concurrent Symposium 1 (Kidney/Pancreas)
Session Topic : New Technology in Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 3F-1

AI in Medical Field

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KAIST, Republic of Korea

Medical artificial intelligence has undergone explosive growth, evolving from early rule-based systems to advancements driven by deep learning. Particularly in the era of generative AI, epitomized by ChatGPT, new developmental directions are being suggested for medical AI, bringing with them new possibilities. Future medical AI is likely to advance toward a system where multiple expert models interact, with an LLM (Large Language Model) integrating these to deliver final diagnostic results to healthcare providers. This progression offers significant insights for building systems that can effectively fuse diverse data and provide practical support in clinical settings.

Keywords: AI, Foundation model, LLM, diffusion model, deep learning

Lecture Code : CC01-S2
Session Name : Concurrent Symposium 1 (Kidney/Pancreas)
Session Topic : New Technology in Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 3F-1

AI in Kidney Pathology

Heounjeong Go
Asan Medical Center, Republic of Korea

Pathology diagnosis is globally shifting from analog methods using glass slides and microscopes to digital methods involving digital image files and computer monitors. The advancement of artificial intelligence (AI)-based programs in pathology has further accelerated this change, with some already being utilized in diagnostic settings. As a result, leading medical institutions worldwide, including in Korea, are actively pursuing the successful implementation of digital pathology systems (DPS). Some institutions have begun incorporating AI-based pathology programs, such as morphometric evaluation tools like the Ki-67 proliferation index and HER2, as well as diagnostic assistance programs for cancer screening and grading in prostate and stomach cancers. To effectively use AI-based algorithms, it is essential to develop programs that deliver diagnostic-level performance. Moreover, clinical implementation requires robust validation of performance, evaluation of generalizability, ensuring safety, and resolving uncertainties in algorithmic judgments. Despite the growing number of AI-based pathology programs, few currently meet these criteria, and there is a lack of sufficient data and validation systems. Additionally, the adoption of platforms like cloud or on-premise systems by medical institutions remains in its early stages. Renal pathology is a prime candidate for utilizing digital pathology platforms and AI-based diagnostic assistance programs. This field requires highly specialized expertise, as it involves synthesizing multiple diagnostic domains, including clinical features, morphology, immunofluorescent findings, immunophenotype, and electron microscopic characteristics. Diagnosing renal pathology involves assessing nearly all tissue components through semi-quantitative or quantitative scoring, making it more labor-intensive compared to other pathology fields. Despite this, significant challenges persist in predicting patient prognosis and treatment response for various diseases. Therefore, AI-based pathology assistance programs are being actively developed to aid in diagnostic screening, quantitative evaluation of tissue components, and establishing prognostic metrics for conditions like glomerulonephritis, diabetic nephropathy, and renal transplant rejection. In this presentation, I will explore the benefits and challenges of implementing DPS and the resulting shifts in pathology diagnostic platforms. I will also highlight the utility of digital pathology and the progress in developing AI-based programs in renal pathology.

Keywords: digital pthology system, artifitial intelligence, renal pathology, diagnositc assistance, integration

Lecture Code : CC01-S3
Session Name : Concurrent Symposium 1 (Kidney/Pancreas)
Session Topic : New Technology in Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 3F-1

Microbiome in Kidney Transplantation

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Korea Institute of Science and Technology, Republic of Korea

Kidney transplantation significantly alters the human microbiome, particularly in the gut, oral cavity, and urinary tract, with important implications for transplant outcomes and patient health. In the gut microbiome, post-transplantation changes are characterized by decreased microbial diversity, which is a key indicator of microbiome health. There is a notable increase in the abundance of Proteobacteria, a phylum that includes many potential pathogens, and a decrease in Bacteroidetes, which are generally associated with gut health. At the genus level, increases are observed in Enterococcus, Escherichia, and Lachnoclostridium, while beneficial bacteria such as Eubacterium, Faecalibacterium, and Bifidobacterium show decreased abundance. These shifts can potentially lead to a less stable and less resilient gut ecosystem. The oral microbiome also undergoes significant changes following kidney transplantation. Within one week of the procedure, there is a marked decrease in alpha diversity, indicating a loss of microbial richness and evenness. Specific bacterial species such as Haemophilus parainfluenzae, Aggregatibacteria segnis and Peptostreptococcus show significant reductions. Conversely, there is an increased abundance of potential opportunistic pathogens like Klebsiella pneumoniae and Pseudomonas species. These changes in the oral microbiome may contribute to oral health issues and potentially systemic complications in transplant recipients. Future research directions include exploring microbiome-based therapies to improve transplant outcomes, studying the effects of immunosuppressants on gut flora, and investigating microbial signatures as predictors of graft function and stability. Understanding these microbiome changes is crucial for developing strategies to enhance long-term graft function and patient health. As research in this field progresses, it may lead to new strategies for managing transplant recipients, from personalized immunosuppression regimens to targeted microbiome interventions. This has the potential to improve not only the outcomes of kidney transplantation but also our broader understanding of the role of the microbiome in human health and disease.

Keywords: kidney, transplantation, gut microbiome, oral microbiome, personalized therapy

Lecture Code : CC01-S4
Session Name : Concurrent Symposium 1 (Kidney/Pancreas)
Session Topic : New Technology in Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 3F-1

Tissue Engineering and Regeneration

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Building a kidney from pluripotent stem cells Most organs have a higher order structure: multiple branched ducts connected to functional units located in the periphery. For example, the kidney has branched collecting ducts connected to multiple nephrons. Recapitulating such an organotypic structure in vitro is a major challenge in developmental biology and regenerative medicine. The kidney develops through the triad interactions of nephron progenitor, ureteric bud and stromal progenitor. We have previously established the induction protocols for the first two from mouse and human pluripotent stem cells (PSCs) (Cell Stem Cell 2014&2017). These protocols have been successfully applied to model inherited kidney diseases, including congenital nephrotic syndrome and autosomal polycystic kidney disease (Stem Cell Reports 2018, J Am Soc Nephrol 2020). We have recently established an in vitro induction protocol for stromal progenitors from mouse PSCs. When the induced stromal progenitors are assembled with two differentially induced parenchymal progenitors (nephron progenitors and ureteric buds), the fully PSC-derived organoids reproduce the higher order kidney structure: branched collecting ducts connected to multiple nephrons with stromal cells distributed between the epithelia (Nat Commun 2022). Thus, integration of PSC-derived lineage-specific stroma into parenchymal organoids will pave the way for recapitulation of organotypic architecture and functions. Generation of a similar structure from human iPSCs is underway. I will also discuss the hurdles that need to be overcome for the future clinical application of organoids for transplantation therapy.

Keywords: kidney, progenitor, pluripotent stem cells, transplantation

Lecture Code : CC02-S1
Session Name : Concurrent Symposium 2 (Liver)
Session Topic : Various Researches and Technologies to Future Direction in Liver Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 5F-1

Recellularized Pig Liver With Human Cells

Scott Nyberg
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Organ bioengineering offers a promising solution to the persistent shortage of donor organs. However, the progression of this technology toward clinical use has been hindered by the challenges of reconstituting a functional vascular network, directing the engraftment of specific functional cell types, and defining appropriate culture conditions to concurrently support the health and phenotypic stability of diverse cell lineages. We previously demonstrated the ability to functionally reendothelialize the vasculature of a clinically scaled decellularized liver scaffold with human umbilical vein endothelial cells (HUVECs) and to sustain continuous perfusion in a large animal recovery model. We now report a method for seeding and engrafting primary porcine hepatocytes into a bioengineered liver (BEL) scaffold previously reendothelialized with HUVECs. The resulting BELs were competent for albumin production, ammonia detoxification and urea synthesis, indicating the presence of a functional hepatocyte compartment. BELs additionally slowed ammonia accumulation during in vivo perfusion in a porcine model of surgically induced acute liver failure. Following explant of the graft, BEL parenchyma showed maintenance of canonical endothelial and hepatocyte markers. Taken together, these results support the feasibility of engineering a clinically scaled functional BEL and establish a platform for optimizing the seeding and engraftment of additional liver specific cells.

Keywords: bioengineered liver, transplantation, liver regeneration, biomatrix, graft

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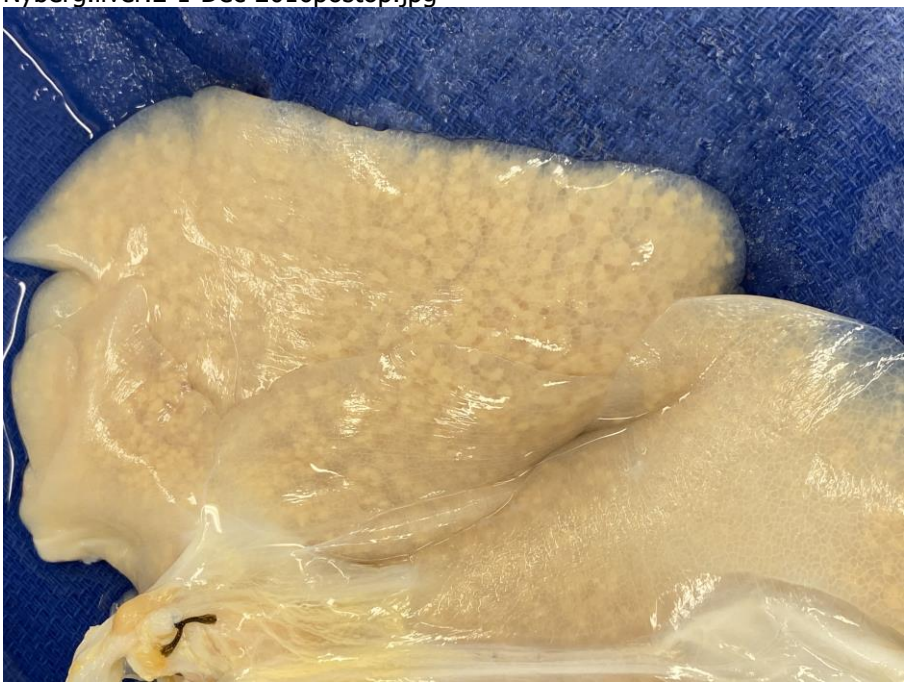

Lecture Code : CC02-S2
Session Name : Concurrent Symposium 2 (Liver)
Session Topic : Various Researches and Technologies to Future Direction in Liver Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 5F-1

3D Bioprinting Strategies for Recapitulation of Hepatic Structure and Function in Bioengineered Liver

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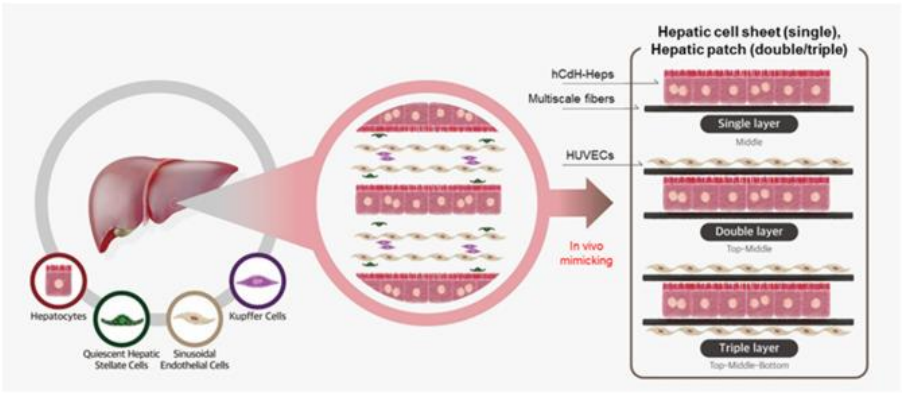
Recently, the use of cell sheets fabricated with bio-applicable materials for transplantation has emerged as a promising approach for treating patients with liver failure. However, the availability of renewable and scalable cell sources for engineered tissue patches remains limited. In a previous study, we introduced a novel type of proliferative bipotent human chemically derived hepatic progenitor cells (hCdHs), generated through small molecule-mediated reprogramming. In this study, we developed a patient-specific hepatic cell sheet derived from liver biopsy hCdHs, constructed on a multiscale fibrous scaffold by integrating electrospinning and three-dimensional (3D) printing technologies. Biomaterial composition analysis revealed that the high-density electrospun sheet significantly enhanced the functional properties of hCdHs. Furthermore, hepatic patches assembled by multilayer stacking of alternate cell sheets composed of hCdHs and human umbilical vein endothelial cells (HUVECs) mimicked liver tissue architecture, with histological and morphological characteristics closely resembling primary human hepatocytes. These hepatic patches also demonstrated notable improvements in hepatic functions, such as increased albumin secretion and cytochrome P450 activity, during in vitro hepatic differentiation, compared to hCdHs cultured in a two-dimensional (2D) monolayer. Interestingly, in the hepatic patch, the induction of functional hepatocytes was linked to both electrospun fiber-facilitated oncostatin M signaling and selective activation of AKT signaling by HUVECs. Remarkably, upon transplantation into a mouse model of therapeutic liver repopulation, the hepatic patch effectively repopulated damaged parenchyma, restored liver function, and improved survival rates (>70%) with healthy liver morphology in the treated lobe. These findings suggest that liver biopsy-derived hCdHs present a viable alternative cell source for developing hepatic cell sheets and patches, offering potential clinical applications in tissue engineering for liver regeneration.

Keywords: Hepatic patch, Artificial liver, hepatic progenitor, Electrospun fiber scaffold

Schematic illustration.jpg



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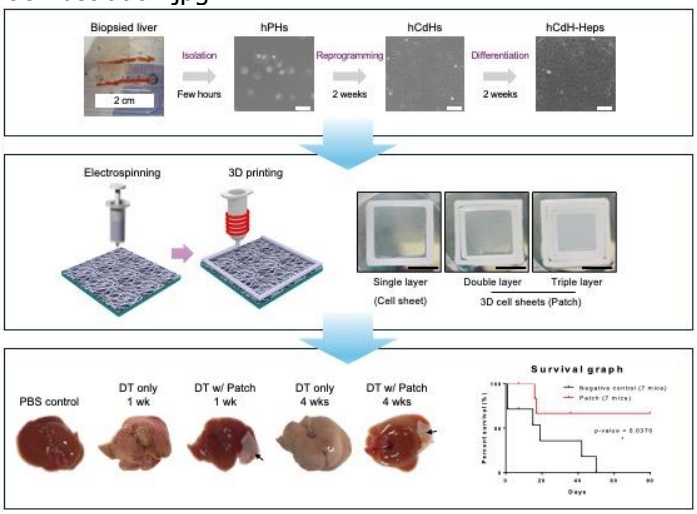

Lecture Code : CC02-S3
Session Name : Concurrent Symposium 2 (Liver)
Session Topic : Various Researches and Technologies to Future Direction in Liver Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 5F-1

Augmented Reality Application in Liver Surgery

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National University Hospital, Singapore, Singapore

Extended Reality (XR) technology, encompassing Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), has evolved significantly in its application to surgery. Initially limited by technical constraints, XR has progressed from basic VR applications in the 1990s to more sophisticated MR systems today. Current applications include advanced surgical training, detailed pre-operative planning, intra-operative guidance, and remote surgical assistance. XR offers unique advantages in surgical education, allowing trainees to develop muscle memory while interacting with 3D anatomical models. In surgical planning and navigation, it enables surgeons to visualize complex 3D anatomies directly, potentially improving precision and reducing complications. Remote surgical assistance through XR platforms has shown promise in addressing healthcare disparities. However, the integration of XR in surgery faces several challenges. These include hardware limitations like image resolution and device comfort, software complexities, computing power constraints, and wireless communication issues. Data privacy and security concerns are significant, especially when handling sensitive patient information. Clinical validation remains a hurdle, with a need for standardized evaluation metrics and large-scale trials. User acceptance is also critical, as surgeons must adapt to new technologies and overcome potential resistance to change.

Keywords: Mixed Reality, Augmented Reality, Liver Surgery, Digital Twin, Artificial Intelligence

Lecture Code : CC03-S1
Session Name : Concurrent Symposium 3 (Basic)
Session Topic : Immunoregulatory Cells in Organ Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 5F-2

PD-L1 Augmentation of in Vivo Generation of pTreg Cells

Defu Zeng
City of Hope National Medical Center, USA

PD-L1 has two receptors: PD-1 and CD801. PD-L1 expression is induced by proinflammatory cytokines (i.e., IFN- and IL-27)2. PD-L1, PD-1, and CD80 are expressed by variety of tissue cells including dendritic cells, lymphocytes, and parenchymal cells2. PD-L1 interaction with PD-1 on activated T cells leads to T cell anergy, exhaustion, and apoptosis3,4, as well as differentiation into Foxp3-IL-10+IFN-g+ Tr1 cells5 and peripheral Foxp3+ Treg (pTreg) cells6,7 under different circumstances. PD-L1/PD-1 interaction augmenting naïve CD4+ T or Th1 cell differentiation into pTreg cells were mainly observed in vitro, and the in vivo effect remains controversial8.

PD-L1 interaction with CD80 in trans were first reported to play an important role in induction of oral antigen tolerance9, down-regulating immune responses1, augmenting Tcon and Treg proliferation, augmenting Tcon expression of PD-1, and reduction of graft versus host disease (GVHD) severity via augmenting PD-L1/PD-1 induction of T cell apoptosis10-12. PD-L1 interaction with CD80 in cis on antigen presenting cells (APCs) were later reported to reduce interactions between PD-L1 and PD-1 as well as CD80 and CTLA4, leading to augment tumor or autoimmunity13,14. However, a more recent report showed that there are both trans and cis PD-L1/CD80 interactions in vivo; although PD-L1/CD80 interactions in cis and in trans may have opposite effects on immunity, the net effect of in vivo blocking PD-L1 interaction with CD80 results in augmenting CD8+ T mediated tumor immunity15. However, whether PD-L1/CD80 interaction in trans regulate pTreg differentiation remains unclear.

Induction of organ transplantation immune tolerance and cure of refractory autoimmune diseases remains a long-sought goal, and organ transplantation is often applied to autoimmune patients who lost the kidney or liver. Induction of mixed chimerism is proposed to be one of the most effective approaches for preventing organ rejection and reversal of autoimmunity16-18. Regular allogeneic hematopoietic cell

transplantation for treating hematological malignancies usually results in complete chimerism with (GVHD)19, we and others showed that GVHD-free mixed chimerism can be established with designed regimen20-22.

We observed that prevention of GVHD in the complete chimeras by augmenting the tolerogenic effect of host-parenchymal PD-L1 interaction with PD-1 via knockdown of STAT3 in donor T cells or via administration of tolerogenic anti-IL-2 did not augment generation of pTreg cells23,24. Induction of MHC-mismatched mixed chimerism in autoimmune diabetic mice, however, not only augmented thymic deletion of autoreactive T cells and thymic generation of tTreg cells but also augmented pTreg generation in the periphery in association with presence of host-type tolerogenic PD-L1hiB220+ plasmacytoid DCs25. Furthermore, induction of MHC-mismatched mixed chimerism in non-autoimmune organ transplantation recipients augmented host-type pTreg generation in association with increase of donor-type tolerogenic PD-L1hiCD8+ DCs26. pTreg cells were found to play important roles in tolerizing residual host-type autoreactive or anti-donor T cells; maintenance of tolerogenic DCs in the mixed chimeras required thymic derived tTreg cells25,26.Therefore, our studies indicate that thymic tTreg cells, tolerogenic DCs, and pTreg cells form a tolerogenic loop that tolerize residual peripheral autoreactive or donor-reactive T cells in the mixed chimeras, leading to organ transplantation immune tolerance and cure of autoimmunity in the absence of GVHD. But this protective loop is lacking in the complete chimeras with GVHD potential.

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Key Words: Organ transplantation immune tolerance, Organ transplantation immune tolerance, Organ transplantation immune tolerance, Organ transplantation immune tolerance

Lecture Code : CC03-S2
Session Name : Concurrent Symposium 3 (Basic)
Session Topic : Immunoregulatory Cells in Organ Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 5F-2

IL-2 Receptor Engineering and Treg Cells

Toshihito Hirai
Tokyo Women's Medical University, Japan

Toshihito Hirai1,2, Federico Simonetta1, Leon L Su3, Lora Picton3, Po-Yu Lin1, Teresa L Ramos1, Jeanette Baker1, K. Christopher Garcia2, Toshio Takagi1, Robert S Negrin1
1Division of Blood and Marrow Transplantation, Department of Medicine, Stanford University, Stanford, CA, 2Department of Urology, Tokyo Women's Medical University, Tokyo, Japan, 3Departments of Molecular and Cellular Physiology and Structural Biology, Stanford University School of Medicine, Stanford, CA,
Two prominent approaches have been advocated to achieve immune tolerance in organ transplantation; mixed chimerism induction via bone marrow transplantation and adoptive transfer of T regulatory (Treg) cells. Furthermore, clinical trials combining both methods, so to speak hybrid tolerance induction approach, have also been reported. However, Treg cell therapy faces limitations in ex vivo expansion processes, particularly with respect to the exhaustion of IL-2 signals. Additionally, calcineurin inhibitors, commonly used post-cell infusion, hinder the expansion of infused Treg cells by depriving them of IL-2 signals. To address these issues, we developed a mouse model in which IL-2 signaling—essential for Treg proliferation, survival, and function—was genetically engineered.
In this model, Treg cells are transduced with a mutated orthogonal IL-2 receptor (Ortho IL-2R) gene that cannot bind to natural IL-2 during ex vivo expansion. These "engineered" Treg cells are then infused into recipient mice that have received a bone marrow graft from a fully allogeneic donor. Following transplantation, an orthogonal IL-2 (Ortho IL-2), which selectively binds to Ortho IL-2R but not to the natural IL-2 receptor, is administered. This allows for the specific in vivo expansion of the engineered Treg cells. In the Ortho IL-2-treated group, we observed enhanced bone marrow engraftment and subsequent acceptance of heart allografts from the same donor. Since Ortho IL-2 restores STAT5 signaling specifically in Ortho IL-2R+ Treg cells, the combination therapy of Ortho IL-2 and calcineurin inhibitors significantly improved the efficiency of transplant tolerance induction.
These findings suggest that cytokine engineering could bring us closer to achieving transplant immune tolerance in clinical settings.

Lecture Code : CC03-S3
Session Name : Concurrent Symposium 3 (Basic)
Session Topic : Immunoregulatory Cells in Organ Transplantation
Date & Time, Place : November 15 (Fri) / 08:00-09:30 / Room 5F-2

Treg Subpopulations in Organ Transplantation

Eui-Cheol Shin
KAIST, Republic of Korea

$CD4^+CD25^+FOXP3^+$ regulatory T (Treg) cells are important for the regulation of the immune response. They contribute to maintenance of immune homeostasis by suppressing excessive immune responses, and their dysregulation is involved in various human diseases, including autoimmune diseases, allergy, and cancer. They also contribute to immune tolerance in transplantation settings. In humans, $CD4^+CD25^+FOXP3^+$ T cells can be classified into three distinct subpopulations based on the expression of CD45RA and FOXP3: $CD45RA^+FOXP3^{lo}$ resting Treg cells, $CD45RA^-FOXP3^{hi}$ activated Treg cells and $CD45RA^-FOXP3^{lo}$ cytokine-secreting non-suppressive cells. In this lecture, cellular and molecular characteristics of Treg subpopulations and their roles in immune tolerance will be discussed.

Keywords: Regulatory T cell, Foxp3, Transplantation, Immunosuppression

Lecture Code : SL02-S1
Session Name : Special Lecture 2
Session Topic : -
Date & Time, Place : November 15 (Fri) / 10:00-10:30 / Room 3F-1

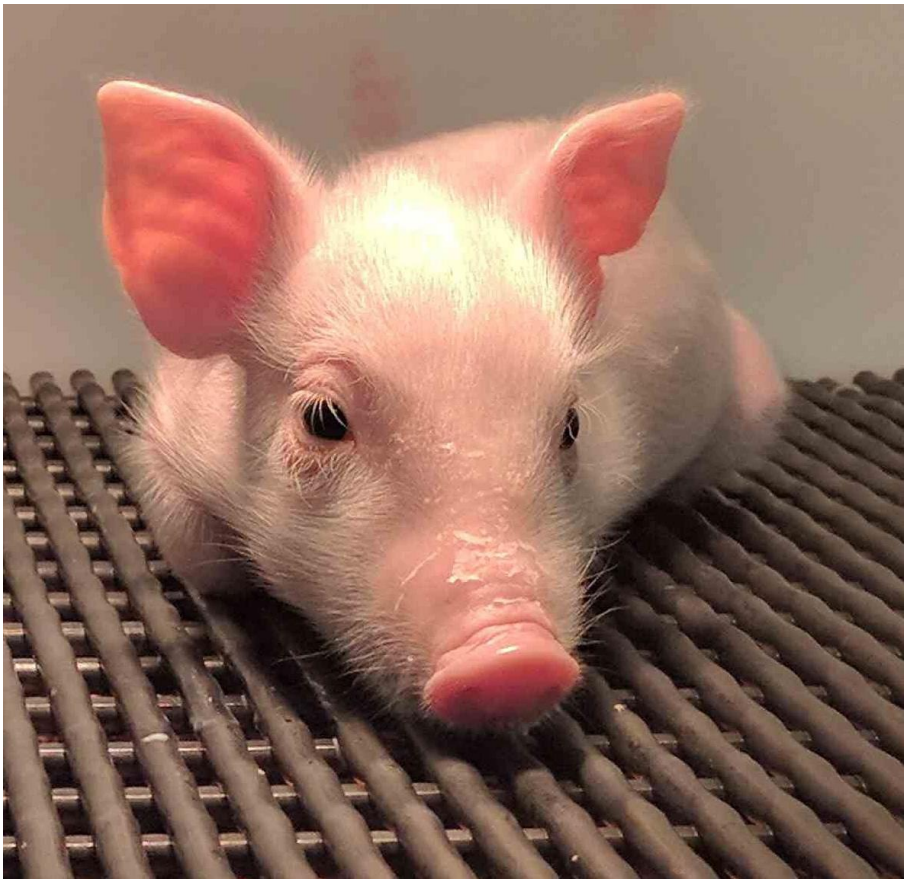
Development of Transplantable Liver from Chimeric Pig

Scott Nyberg
Mayo Clinic, , United States

Numerous liver diseases can be successfully treated with liver transplant, regeneration, or cell therapy, and the numbers requiring such interventions continue to grow. Potential conditions indicating transplant include acute liver failure, various forms of cirrhosis, cancer, alcoholic liver disease, metabolic disease, and autoimmune disease. Despite the high success rate of liver transplants to those who receive one, the supply from organ donors lags far behind the demand for liver transplants. The greatest barrier to widespread application of synthetic engineered liver grafts for treatment of human liver disease is absence of an abundant, readily available and high-quality source of human hepatocytes. Past approaches have used imperfect substitutes such as animal hepatocytes, oncogenic human cell lines, and induced pluripotent stem cell (iPSC)-derived human hepatocyte-like cells, which each pose significant limitations. For example, in vitro maturation of iPS cells has resulted in hepatocyte-like cells (HLC) that lack normal levels of essential hepatic enzymes, including our observations of low urea cycle activity. In addition to liver transplant, liver tissue is needed for development and safety testing of new drugs, many of which are detoxified by the liver or used for treating liver disorders. Such testing is necessary as a preliminary step before translating to human clinical trials. As such, human liver tissue is sorely needed and one superior option is to use immunodeficient animals as incubators for rapid production of human hepatocytes. Our experience over the past 20 years will be the focus of this Special Lecture.

Keywords: liver tissue enginering, chimeric pig, liver failure, liver regeneration, transplantation

Eddy day 12c.jpg



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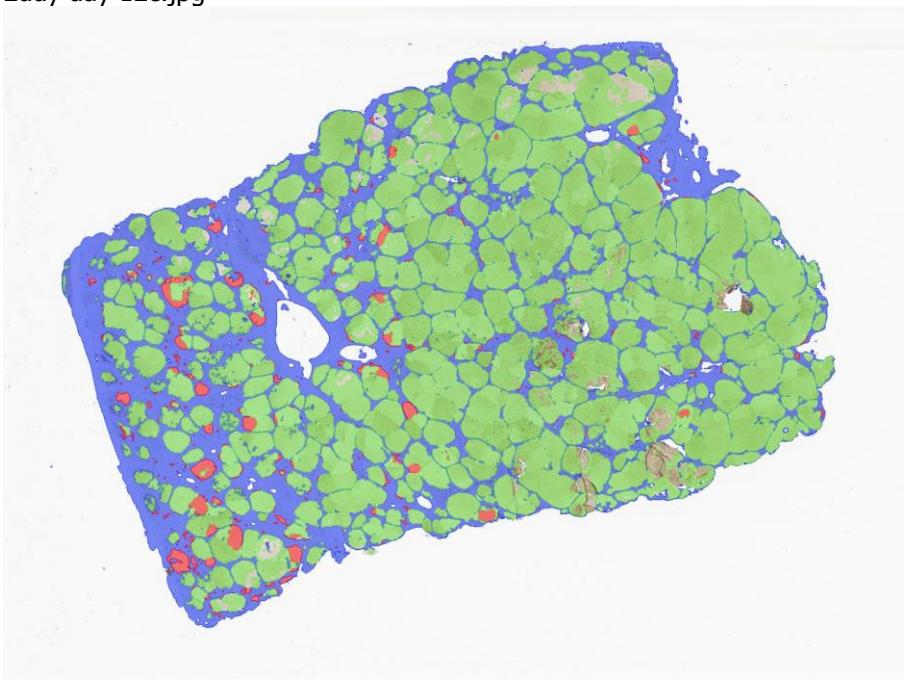

Lecture Code : KL02-S1
Session Name : Keynote Lecture 2
Session Topic : -
Date & Time, Place : November 16 (Sat) / 15:00-15:30 / Room 3F-1

Porcine Liver Xenotransplantation - Bridge for Life Saving?

Hidetaka Hara
The Second Affiliated Hospital, Hainan Medical University, China

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For patients with end-stage liver disease, life-saving alternatives are limited, making transplantation the primary treatment option. Pig liver xenotransplantation has emerged as a promising solution to address the critical shortage of donor organs. Significant progress in xenotransplantation has been achieved through advances in genetically engineered pigs and novel immunosuppressive treatments. These developments have led to improved outcomes in pig heart and kidney xenotransplantation in nonhuman primates, paving the way for initial clinical trials. However, pig liver xenotransplantation continues to face unique challenges, such as antibody-mediated rejection, coagulation incompatibilities, thrombocytopenia, and persistent inflammation, all of which hinder long-term survival and require further research. This keynote will summarize the extensive experimental and clinical experiences with liver xenotransplantation, including the transition from primate to pig donors driven by ethical and zoonotic considerations. It will also explore the potential role of pig liver xenografts in managing hepatic failure, both as a bridge to allotransplantation and as auxiliary support following it. Emerging strategies, including genetic modifications and pharmacological interventions, will be discussed in relation to these applications. Finally, recent cases of pig liver xenotransplantation in China involving both decedents and a living patient will be discussed, highlighting the expanding clinical applications of pig liver xenografts and the groundwork they lay for future clinical trials.

Keywords: Clinical application, Decedent models, Genetically engineered pigs, Liver transplantation, Xenotransplantation

Lecture Code : XS01-S1
Session Name : Xenotransplantation Symposium 1
Session Topic : How to Launch Clinical Trials of Xenotransplantation in Asia
Date & Time, Place : November 15 (Fri) / 13:40-14:40 / Room 6F-1

Cultivation of DPF Gene-Edited Donor Pigs and Exploratory Subclinical Research

Dengke Pan
Chengdu Clonorgan Biotechnology Co., Ltd, China

First of all, we will introduce the latest development of xenotransplantation in the world. Somatic cell cloning, gene editing and new immunosuppressants promote the development of xenotransplantation. Xenotransplantation has started clinical research. Then it focuses on the in-depth research and development of gene editing donor pigs, cultivating more than 10 kinds of gene editing donor pig strains, and realizing the conservation, breeding and stable passage of gene editing donor pigs. A medical ultra-clean DPF facility has been built to provide clinical biosafety organ donor pigs. More than 60 pre-clinical trials of gene editing pig liver, kidney, heart and non-human primates were carried out. It completed the world's first subclinical study of gene editing pig liver, lung and red blood cell transplantation to brain-dead patients, and the first subclinical study of gene editing pig kidney to brain-dead people in China. Clinical treatment of the first case of six-gene edited pig skin transplantation in China for the treatment of extremely severe burn patients.

Keywords: gene modifed pig, DPF, preclinical , clinical study, xenotransplantation

Lecture Code : XS01-S2
Session Name : Xenotransplantation Symposium 1
Session Topic : How to Launch Clinical Trials of Xenotransplantation in Asia
Date & Time, Place : November 15 (Fri) / 13:40-14:40 / Room 6F-1

Fetal Kidney Grafts from Pigs in Japan: A DPF Protocol of Production and Long-Term Cryopreservation

Eiji Kobayashi
The Jikei University School of Medicine, Japan

Fetal kidney grafts from pigs in Japan: A DPF protocol of production and long-term cryopreservation Eiji Kobayashi Treatment of infectious diseases, such as viruses introduced through transplanted pig organs, relies on facilities equipped with DPF technology to improve clinical xeno-organ transplantation. Transplant recipients receive powerful non-specific immunosuppressive therapy that produces traces of potentially fatal viruses. Therefore, the pig organs used for transplantation must be strictly handled to ensure the absence of pathogens. We aimed to provide xeno-regenerative therapy by transplanting pig fetal organs. Blood flow from the recipient enters the transplanted pig fetal kidney, resulting in a weaker rejection and promoting joint growth. The safety of pig fetal kidney grafts for transplantation is verified using the following protocol: pregnant miniature pigs raised under SPF conditions undergo cesarean to extract fetuses, and fetal kidney grafts are stored in clean aseptic benches in a sterile environment. The fetal kidney grafts were repeatedly obtained 2–3 times without scarification from the 30-day-gestational mother pigs. The donor fetal kidney graft can be maintained for two years under cryopreservation; molecular biology techniques are used to verify the absence of infectious diseases in other fetal organs according to xenotransplantation guidelines, along with screening for placenta-transmitted viruses. Our pig fetal kidney transplant allows cryopreservation, enabling various safety validations using the remaining fetal tissues before transplantation. It is worthwhile saying that our fetal kidney graft can transport from overseas. It means that international collaboration to test benefit and pitfall of each group's pig organ without maturation of their pigs.

Keywords: Xenotransplantation, Pig , DPF, fetus

Lecture Code : XS01-S3
Session Name : Xenotransplantation Symposium 1
Session Topic : How to Launch Clinical Trials of Xenotransplantation in Asia
Date & Time, Place : November 15 (Fri) / 13:40-14:40 / Room 6F-1

Approaches to the Clinical Xenotransplantation in Korea

IK JIN YUN
Konkuk University Medical Center, Republic of Korea

For the shortage of donated organs and the several ethical problems of human donation activity of organ, the xenotransplantation is the sole alternative for the allotransplantation. Afte the development of GalTKO, the transgenic technique to the pig which is the potential donor is highly advanced to the level of clinical application. The pig to NHP (Non-Human Primate) preclinical studies have shown that the survival of transplanted xeno organ reached the consideration for the initiation of clinical studies. We, in Korea, also have done pig to NHP preclinical studies of the kidney, heart and partial and total cornea xenotransplantation and good results are developed on the recent years. Now, it is the time that we consider and set the principles that satisfy the conditions to start the clinical studies and fulfill the clinical applications. The most fundamental principle to satisfy the conditions of initiation of clinical studies is the results of pig to NHP preclinical studies. Especially, the survival data is the most important factors. Since decades ago, several guidelines have been set for the minimal requirement of graft survival. Comparing with the allograft, xenotransplantation has itself difficulties to estimate the sufficient graft survival rate to satisfy the initiation of clinical studies. Because 1 year survival rate for all the allograft is over 90% and long-term survival is exceeding the 20 years. So, for the xenograft, 6 months to 1 year survival is satisfying conditions to consider the clinical trials. Nowadays, if 5 of consecutive 8 cases are living more than 6 months or consecutively 5 cases are surviving more than 6 months, the conditions for the preclinical NHP survival are regarded as satisfactory. In Korea, one case of kidney and heart is survived over the 6 months. So, conditions for survival are not to be said yet. However, regarding development of NHP experiments, within the coming 2 to 3 years, we can reach the results to say about the survival rate for the clinical studies. The other important conditions for the clinical studies are establishing the immune modulation protocol. First, experiments should be successful with the approved immunosuppressants. Typically, cobra venom factor and anti-CD 154 should be eradicated from the protocol. So, we have tried several immunosuppressants and C-5 inhibitors for anticoagulation. The results are not successful yet, we expected improvements and approvals for the new trial drugs. We already have set up the DPF facility in the Korean institute for Animal Science (KIAS) and Optipharm. We can satisfy the conditions of protection from

zoonosis. Even we protect the PERV-c infection genetically. We will have checked continuously about the zoonosis problems in the facility and xeno-transplanted monkey. The other barrier to the clinical xenotransplantation is the psycho-social resistance. They include the opposition of animal welfare organizations, concern about the safety of infectious dissemination like zoonosis and identity issues for the receiver of the animal vital organ like heart and the objection or reservation for the legislation for the xenotransplantation acts.

Keywords: xenotransplantation, clinical trial, pig-to-NHP preclinical experiment, survival, zoonosis

Lecture Code : WIT01-S2
Session Name : Woman In Transplantation (WIT) in KST
Session Topic : -
Date & Time, Place : November 15 (Fri) / 13:40-14:40 / Room 5F-3

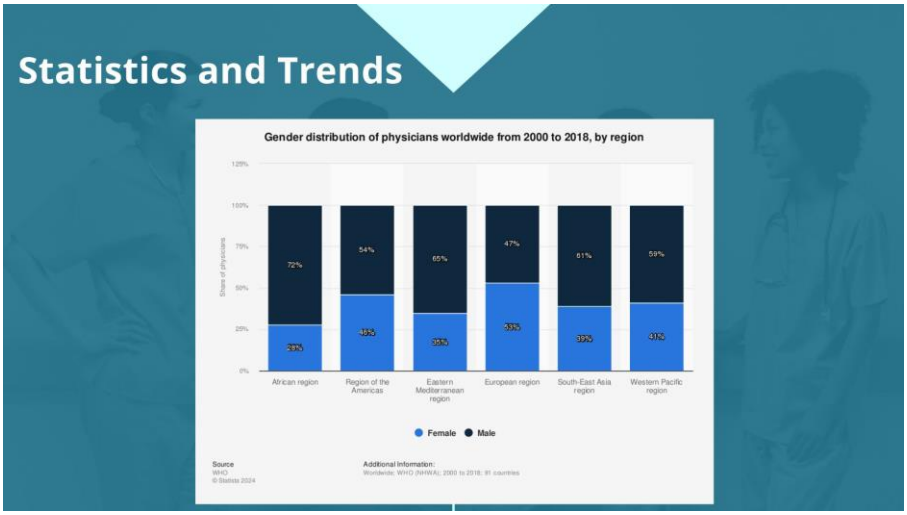
Career Development in Medical Field

ROSE MARIE LIQUETE
NATIONAL KIDNEY AND TRANSPLANT INSTITUTE, Philippines

This presentation aims to discuss career development opportunities for women, examine the specific challenges and barriers they face in transplantation, and highlight successful case studies and strategies for advancement. The structure of the presentation will cover the current landscape of women in medicine, with a focus on gender representation and achievements in various medical specialties, particularly in transplantation. It will then delve into the challenges women encounter, such as gender bias, work-life balance issues, structural barriers within medical institutions, and the lack of representation and role models. The presentation will also outline career development opportunities, including relevant educational pathways, mentorship, and professional development resources. Strategies for overcoming these challenges will be discussed, focusing on addressing gender bias, improving work-life integration, and creating supportive environments within healthcare institutions. Additionally, notable women leaders in transplantation will be profiled, along with innovative programs designed to promote women's advancement in the field. Finally, the presentation will conclude with an outlook on emerging trends and recommendations for fostering greater gender equity in the medical field, particularly in transplantation.

Keywords: career development opportunities for women, transplantation, gender bias, gender equity, women leaders in transplantation, structural barriers within medical institutions

Gender distribution of Physician Worldwide from 2000-2018 by region.jpg



Gender distribution of Physician Worldwide from 2000-2018 by region.jpg

The percentage of active women physicians in 44 medical specialties: *

Allergy & Immunology – 38.4%

Anatomic/Clinical Pathology – 37.8%

Anesthesiology – 25.5%

Cardiovascular Disease – 14.1%
Child & Adolescent Psychiatry – 52.7%

Critical Care Medicine – 26.1%
Dermatology – 48.9%
Emergency Medicine – 27.6%
Endocrinology, Diabetes & Metabolism – 49.0%

Family Medicine/General Practice – 40.0%

Gastroenterology – 17.6%
General Surgery – 20.6%
Geriatric Medicine – 52.6%
Hematology & Oncology – 33.3%
Infectious Diseases – 41.1%
Internal Medicine – 37.9%
Internal Medicine/Pediatrics – 57.8%
Interventional Cardiology – 7.7%
Neonatal-Perinatal Medicine – 51.1%
Nephrology – 28.3%
Neurological Surgery – 8.4%

Neurology – 29.4%

Neuroradiology – 19.5%

Obstetrics and Gynecology – 57.0%

Ophthalmology – 25.3%
Orthopedic Surgery – 5.3%

Otolaryngology – 17.1%

Pain Medicine and Pain Management – 18.4%

Pediatric Cardiology – 35.9%
Pediatric Hematology/Oncology – 53.4%
Pediatrics – 63.3%
Physical Medicine & Rehabilitation – 35.5%
Plastic Surgery – 16.0%

Preventive Medicine – 33.8%
Psychiatry – 39.1%
Pulmonary Disease – 11.8%
Radiation Oncology – 27.2%
Radiology & Diagnostic Radiology – 25.6%
Rheumatology – 44.7%
Sports Medicine (Orthopedic Surgery) – 6.6%
Thoracic Surgery – 7.0%
Urology – 8.7%
Vascular and Interventional Radiology – 9.5%
Vascular Surgery – 13.1%

ALL SPECIALTIES – 35.2%

**From the AAMC 2018 Physician Specialty Data Report, using the 2017 AMA Physician Masterfile.*

Lecture Code : CC04-S1
Session Name : Concurrent Symposium 4 (Liver)
Session Topic : Pediatric Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-1

Technical Considerations in Liver Transplantation for Infants and Small Children: North American Perspective

George Mazariegos
UPMC Childrens Hospital of Pittsburgh, United States

Pediatric liver transplantation has reached significant survival outcomes in the United States with 1- year patient and graft survival of 97.3 and 96.6% reported in the SPLIT registry (Elisofon et al. 2020) and projected 20 and 30 year outcomes now reaching 84% and 80.1%, respectively (Bowring et al. 2020). However, significant opportunities remain to benefit the most vulnerable population: neonates and small infants, especially those under 5 kg. Outcomes in this population have been reported to have the highest pre transplant mortality and some reports have detailed inferior outcomes (Arnon et al. 2011; Jain et al. 2021; Noujaim et al. 2002). The critical factors to optimizing outcomes in these children involve multiple modalities including medical, ICU care and renal support. Fundamentally however, the most urgent remaining need in North America is ensuring that these infants receive a timely transplant, as significant center variability exists among utilization of technical variant grafts (TVG) in the US (Mazariegos et al. 2023). Important elements to optimize outcomes include mastering techniques of graft selection (Mazariegos 2017; Eguchi et al. 2024) graft reduction (Kasahara et al. 2024) and other technical experience in living donor or deceased donor TVG utilization (Stoltz et al. 2023; Yoeli et al. 2022). Long term analysis suggests that results in these most at-risk infants can be satisfactory over the long term and therefore innovative approaches to caring for these children should be implemented. These include removing disincentives to transplanting these infants from excessive oversight by regulatory bodies and utilization of learning health networks (LHN) (Perito et al. 2021) to serve as peer review hubs for improvement rather than negative flagging of program performance. Further work by LHN such as the Starzl Network can help to better standardize processes for transplanting these children by defining bet approaches for graft reduction, achieving wound closure and optimizing ICU, anesthetic and post-transplant immunosuppression management.

Keywords: outcomes, technical variant grafts, living donor techniques, graft reduction, learning health networks

Lecture Code : CC04-S2
Session Name : Concurrent Symposium 4 (Liver)
Session Topic : Pediatric Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-1

Technical Considerations in Liver Transplantation for Infants and Small Children: Asian Perspective

Mureo Kasahara
National Center for Child Health and Development, Japan

As of December 2023, the National Centre for Child Health and Development performed 837 pediatric liver transplants. Transplanting a relatively large adult partial liver into a small child is challenging because of the difficulty in maintaining adequate blood flow to the transplanted liver. The optimal graft weight for paediatric recipients is reported to be 2-4% of body weight (graft-to-recipient weight ratio: GRWR). For example, the maximum graft weight in a child weighing 5 kg is only 200 g (4%). In paediatric LDLT, an adult donor liver's LLS is usually applied. However, LLS often weighs more than 250~300g, which may be too much for neonates or infants weighing less than 5 kg. To overcome this problem, our centre has developed a hyper-reduced lateral segment graft, in which the lateral segment is further reduced in size and thickness by surgical resection according to the abdominal cavity of the recipient. This innovative technique has significantly improved transplant outcomes in cases of metabolic liver disease and acute liver failure in neonates and infants weighing less than 5 kg from 57.3% to 92.4% in three years of graft survival. It has made transplantation possible for neonates weighing as little as 2.4 kg, who were previously considered unsalvageable, and for infants with acute liver failure or metabolic liver disease weighing less than 5 kg, where poor weight gain and graft size mismatch were significant challenges. This innovation implies that LT can now be applied to extremes of graft-size requirements.

Keywords: pediatric , liver transplantation, reduced size graft, monosegment

Lecture Code : CC04-S3
Session Name : Concurrent Symposium 4 (Liver)
Session Topic : Pediatric Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-1

3D Printing Technology to Predict Size-matching in Liver Transplantation

Jinsoo Rhu
Samsung Medical Center, Republic of Korea

Appropriateness of liver graft is always the issue in liver transplantation. While living donor liver transplantation usually has the concern on small-sized graft, deceased donor liver transplantation and pediatric liver transplantation have the concern on large-sized graft. While these concerns can be managed systematically by allocating deceased donor based on the body size, there is always a blind spot where large-for-size syndrome can occur. By this lecture, we present our solution of preventing large-for-size sydnrome, by impletmenting 3D printing technology. As 3D printing technology has been established as a feasible option, we managed to evolve these approach by adding AI for automated graft volume measurement of the donor. We believe that donors with CT scan be assessed using AI and 3D technology and further make these risk minimized using these high technology approach.

Keywords: 3d printing, 3d modeling, large-for-size syndrome, artificial intelligence, liver transplantation

Lecture Code : CC04-S4
Session Name : Concurrent Symposium 4 (Liver)
Session Topic : Pediatric Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-1

Infectious Considerations in Young Transplant Recipients

JIMAN KANG
Yonsei University College of Medicine, Republic of Korea

Pediatric recipients represent a small fraction of the solid organ transplant recipient (SOTR) population, and research on this group remains limited. As a result, clinical guidelines for pediatric SOTRs are often adapted from adult protocols. However, in certain scenarios, it becomes clear that "children are not just small adults," as unique challenges emerge in pediatric care. In this lecture, I will address key infectious disease issues specific to pediatric transplant patients. First, we will discuss early infectious complications following pediatric liver transplants, highlighting cases of fungal infections. Second, we will discuss dosing challenges of oral valganciclovir (VGCV) in cytomegalovirus (CMV) prophylaxis in pediatric SOTRs. Third, we will review severe complications from common community-acquired infections. Fourth, we will explore the epidemiology of Epstein-Barr virus (EBV) viremia in Korean pediatric SOTRs, a known risk factor for post-transplant lymphoproliferative disorder (PTLD). I look forward to an engaging hot discussion on these important infectious disease considerations in pediatric SOTRs.

Keywords: Children, SOT, CMV, EBV, Infection

Lecture Code : CC05-S1
Session Name : Concurrent Symposium 5 (Kidney/Pancreas)
Session Topic : Care of Post Transplant Malignancy
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-1

Prevention and Management of Post-Transplant Malignancy

Kajohnsak Noppakun
Faculty of Medicine, Chiang Mai University, Thailand

The incidence of acute rejection following transplantation is significantly lowered due to improved immunosuppressive efficiency. Nonetheless, the inevitable result is an increase in the incidence of post-transplant malignancies. Malignancies increase dramatically in transplant recipients, particularly Kaposi sarcoma, non-melanoma skin tumors, and posttransplant lymphoproliferative disease (PTLD). Immunosuppression plays a significant role in the development of post-transplant malignancies, which are caused by a complex interaction of factors, including viral infections. Chronic immunosuppressive treatment impaires the recipient's immune system, making it less capable of recognizing and eliminating cancer cells. Furthermore, viral infections, particularly Epstein-Barr virus and Human papillomavirus, have a substantial impact on the development of cancer. Certain cancer risks can be reduced by adopting healthier habits, such as stopping smoking and using sunscreen. Regular screening for malignancies may provide the early detection, but its cost-effectiveness in transplant recipients remains debatable. Customizing immunosuppressive regimens is crucial for preserving allograf function following a cancer diagnosis. Treatment options, such as chemotherapies, targeted therapies, and immunotherapies, should be selected with consideration of the patient's overall health status and the potential impact on the transplanted organ. A multidisciplinary approach is essential in order to provide optimal cancer treatment for transplant recipients.

Keywords: Malignancy, Calcineurin inhibitors, PTLD, mTOR inhibitors, Targeted therapies

Lecture Code : CC05-S2
Session Name : Concurrent Symposium 5 (Kidney/Pancreas)
Session Topic : Care of Post Transplant Malignancy
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-1

Immune Checkpoint Inhibitor in Solid Organ Transplant

Myung-Gyu Kim
Korea University Anam Hospita, Republic of Korea

The development of immune checkpoint inhibitors (ICIs) such as anti-CTLA4 and anti-PD-1/PD-L1, has transformed cancer treatment, with their therapeutic indications now extending to more than 22 types of cancer. Solid organ transplant recipients (SOTRs) are 3 to 5 times more likely to develop malignancies compared to the general population, making cancer one of the leading causes of death in this group. Immunotherapy, particularly ICIs, offers a potential option for treating malignancies in SOTRs, but concerns about transplant rejection remain significant. While ICIs have demonstrated anti-cancer efficacy in immunosuppressed patients, their response rates are generally lower than those observed in immunocompetent individuals. Retrospective studies also indicate a 30-40% risk of rejection, with over half of these cases occurring early in the course of treatment and often progressing to graft loss. Although certain immunosuppressants may lower the risk of rejection, adjusting immunosuppressive therapy requires careful consideration of its effects on both the graft and the malignancy. Identifying the optimal immunosuppressive regimen that balances the risks of graft rejection/ loss, while maximizing the benefits of ICIs in cancer treatment, remains a complex challenge. A multidisciplinary approach, involving active patient participation, is crucial to minimizing clinical dilemmas. Additionally, prospective studies are needed to further establish the efficacy and safety of ICIs in this population.

Keywords: immune checkpoint inhibitors, anti-CTLA4, anti-PD-1, malignancy, rejection

Lecture Code : CC05-S3
Session Name : Concurrent Symposium 5 (Kidney/Pancreas)
Session Topic : Care of Post Transplant Malignancy
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-1

CAR-T Therapy for Kidney Transplant Recipients- Nephrologist's View

Naoka Murakami
Washington University in St. Louis, United States

Post-transplant cancer and infections are leading causes of death after solid organ transplant. Chimeric antigen receptor-T cell (CAR-T) and virus-specific T cell (VST) therapies are emerging as novel therapies for these conditions. While these therapies are shown to be effective in non-transplant population, data in transplant populations are limited. In this lecture, we will update the available data on immunosuppression management when treating patients with CAR-T and VST, from transplant nephrologist standpoint.

Keywords: CAR-T, Virus-specific T cell therapy , Post-transplant lymphoproliferative disorder , Immunosuppression, Post-transplant cancer

Lecture Code : CC05-S4
Session Name : Concurrent Symposium 5 (Kidney/Pancreas)
Session Topic : Care of Post Transplant Malignancy
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-1

Virus Specific & CAR-T Cells for PTLD After Solid Organ Transplants

Jeremy Rubinstein
Cincinnati Children's Hospital Medical Center, United States

Post-transplant lymphoproliferative disorder (PTLD) is a diverse set of diseases that can occur after stem cell and solid organ transplantation, ranging from a non-destructive process to full blown maligant lymphoma. These are often driven by EBV infection although EBV negative PTLD occuring late after transplantation is increasingly common. While management practices between pediatric and adult providers have subtle differences, hallmarks of therapy include reduction of immunosuppression (when tolerable) and rituximab. The need for chemotherapy depends in part on initial response along with disease histology. In recent years, there is increasing evidence for the use of novel cellular and immune therapies in the management of PTLD. This lecture will review published data on the use of EBV directed virus specific T-cell therapy (VSTs) in the management of PTLD and will cover clinical trial data in this space. CAR-T cell therapy has been used in smaller numbers, somewhat complicated by the need for concurrent immunosuppression and will review data for these patients as well.

Keywords: PTLD, EBV, virus specific T-cells, CAR-T cells

Lecture Code : CC06-S1
Session Name : Concurrent Symposium 6 (Basic)
Session Topic : Recent Update on Immunology of Organ Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-2

IL-2 Signals and Foxp3-Rich Lymphoid Structures in Allograft

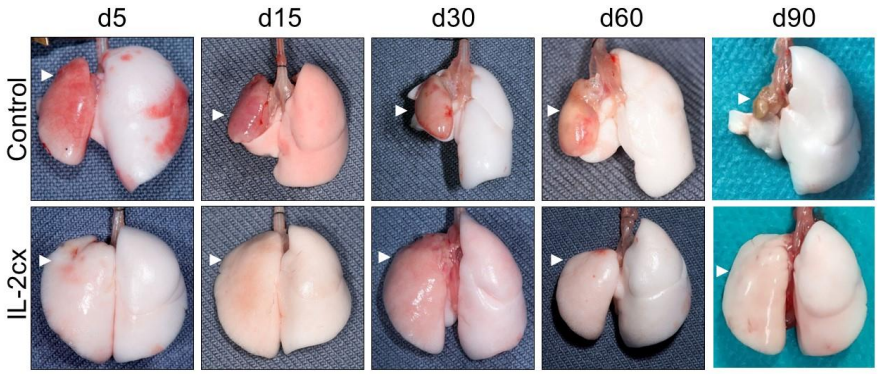
Yoshito Yamada
Kyoto University, Japan

Lung transplantation is an established therapy for patients with end-stage pulmonary diseases, yet survival rates are hindered by chronic allograft rejection, particularly chronic lung allograft dysfunction (CLAD), a major impediment to long-term survival. This study explores the potential of biased interleukin-2 (IL-2)/anti-IL-2 antibody complex pre-conditioning, aimed at IL-2 receptor α, to overcome this challenge. By this method, we successfully maintained fully mismatched orthotopic lung allografts that stayed morphologically and functionally intact beyond 90 days in immunocompetent mice. These allografts were sustained primarily through the regulatory influence of forkhead box p3 (Foxp3)+ regulatory T (Treg) cells localizing to lung allografts. Even after the cessation of IL-2 treatment, while circulating Treg cell counts reverted to baseline levels, Foxp3+ Treg cells persisted in the peribronchial and peribronchiolar regions, organizing into structures akin to inducible tertiary lymphoid structures (iTLS). Comprising Foxp3+ Treg cells, conventional T cells, and B cells, these iTLS proved pivotal for allograft tolerance, as evidenced by microscopy-based distribution and neighborhood analyses. Utilizing Foxp3-transgenic mice engineered for inducible and selective deletion of Foxp3+ cells, we demonstrated that the inability to form iTLS correlates strongly with acute allograft rejection. This study underscores the effectiveness of short-term, high-intensity, and biased IL-2 pre-conditioning in promoting the acceptance of vascularized and ventilated lung allografts without ongoing immunosuppression, primarily through Foxp3-mediated iTLS formation, highlighting a novel approach to improving long-term outcomes in lung transplantation.

Keywords: Interleukin-2, Allotransplantation, Regulatory T cells, Lymphoid tissues, Lymphocyte differentiation

スライド 1.JPG

Pre-LTx IL-2cx treatment prevents from allograft damage macroscopically



Lecture Code : CC06-S2
Session Name : Concurrent Symposium 6 (Basic)
Session Topic : Recent Update on Immunology of Organ Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-2

Gamma-Delata T Cells & Organ Transplantation

Tae Jin Kim
Sungkyunkwan University, Republic of Korea

γδ cells are innate T cells with various features such as cytotoxic, antigen-presenting, or cytokine-producing capacities. γδ cells are largely divided into Vδ1 and Vδ2 cells along with Vδ3 and Vδ4-8 (shared with TCRα) cells. Vγ9Vδ2 cells are predominant in blood, respond to phosphoantigens (metabolites) presented in butyrophilins, and infiltrate into inflamed tissue. Vδ1 cells with various Vγchains are mostly tissue-resident and expand in response to specific antigens. The antigens recognized by Vδ1 TCRs are not well elucidated but are believed to include stress-related molecules. Both Vδ1 and Vδ2 cells participate in the immune response to the graft in differential ways. Here, we investigated the involvement of γδ T cells in the rejection against αGal-deficient xenografts in male cynomolgus monkeys. αGal-deficient pig xenografts are protected from hyperacute rejection during xenotransplantation but are still rejected more rapidly than allografts. Non-Gal carbohydrate antigens can be targeted by xenoreactive Abs as well as γδ cells. Proportions and TCR repertoires of blood γδ T cells were analyzed before and after porcine vessel xenotransplant into male cynomolgus monkeys. Blood γδ T cells expanded and infiltrated into the graft vessel adventitia following xenotransplantation of α-Gal-deficient pig blood vessels. Pre- and post-transplant analysis of γδ TCR repertoire revealed a transition in δ chain usage post-transplantation, with the expansion of several clonotypes of δ1, δ3, or δ7 chains. Furthermore, the distinctions between pre- and post-transplant δchain usages were more prominent than those observed for γ chain usages. In summary, γδ TCR repertoire was significantly altered by xenotransplantation, suggesting the role of γδ T cells in sustained xenoreactive immune responses.

Keywords: Gamma-delta T cell, xenotransplantation, TCR repertoire, porcine vessel

Lecture Code : CC06-S3
Session Name : Concurrent Symposium 6 (Basic)
Session Topic : Recent Update on Immunology of Organ Transplantation
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-2

Immunology of Xenotransplantation

Hyun Je Kim
Seoul National University College of Medicine, Republic of Korea

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Xenotransplantation, the transplantation of organs, tissues, or cells from one species to another, offers a viable solution to the critical shortage of human organs available for transplantation. However, to achieve successful xenotransplantation, it is essential to address significant immunological barriers resulting from the complex interactions between the host and donor immune systems. Both innate and adaptive immune barriers are critical considerations in this process. The field of transplantation has a rich history of innovation, with efforts focusing on clinical trials and methods to induce immune tolerance among recipients. Notably, advancements in genetically modified pigs for immunomodulation offer promising avenues for improving transplant survival rates. The integration of omics technologies is also transforming transplant science, emphasizing the importance of cutting-edge genetic analysis in understanding the underlying mechanisms of rejection and enhancing transplant outcomes. This presentation will cover the key concepts of transplant immunology and current advances in the field of xenotransplantation, including the application of omics technology.

Keywords: Xenotransplantation, Transplant Immunology, Omics, Immunological Barrier, Immune Tolerance

Lecture Code : CC07-S1
Session Name : Concurrent Symposium 7 (Infection)
Session Topic : Antibiotic Stewardship in Transplant Setting
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-2

What Is Antibiotic Stewardship?: ID Physician's View

Ban Hock Tan
Singapore General Hospital, Singapore

Antibiotic stewardship is recognized as one of the crucial strategies in the fight against the problem of rising antimicrobial resistance (AMR). Many guides on how to start and run an antibiotic stewardship program (ASP) in the hospital have been published. Antibiotic stewardship, however, is always an uphill task, for hospital administrators and individual physicians. A lot of the problem centres around the issue of diagnostic uncertainty. Patient expectations and litigation concerns are other important forces that compel doctors to act in certain ways. In the transplant setting, the issue of diagnostic uncertainty is magnified, since many complications of transplantation mimic infections. At the end of the day, the individual physician can only be appropriate in the clinical circumstances. The battle against AMR must be fought on many fronts.

Keywords: Antimicrobial , Resistance , Diagnostic , Uncertainty, Infections

Lecture Code : CC07-S2
Session Name : Concurrent Symposium 7 (Infection)
Session Topic : Antibiotic Stewardship in Transplant Setting
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-2

Antibiotic Stewardship: What Transplant Surgeons Want

HYUNG JOON AHN
Kyung Hee University Medical Center, Republic of Korea

Solid organ transplant (SOT) recipients are at high risk for early postoperative infectious complications due to the complexity of surgical procedures, prior end stage organ disease, multiple comorbidities, the elevated net state of immunosuppression in the posttransplant period and to the high risk for colonization and infections caused by multidrug resistant organism (MDRO). Antibiotic Stewardship programs (ASP) lead institutional and individual efforts to promote responsible antimicrobial use to fight antimicrobial resistance and other consequences of antibiotic use, such as Clostridiodes difficile infection, drug interactions, and end-organ toxicities. AMS programs are multifaceted and affect both diagnostic programs, nonpharmacological interventions, and antibiotic prescriptions. For a successful ASP, the unique culture of the hospital, attitudes of medical staff, and the available resources, and the advantages and disadvantages of the core strategies should be considered. The data collected in a standardized, prospective method offers tremendous opportunities to understand antibiotic practices and infectious complications. High-qualified guidelines exist that provide a robust framework to establish good clinical practices in SOT. For transplant surgeons, it is important to create personalized Perioperative Antibiotic Stewardship to avoid unwanted consequences of antimicrobials and to improve transplant outcomes.

Keywords: Antibiotic, Stewardship, programs , solid organ , transplantation

Lecture Code : CC07-S3
Session Name : Concurrent Symposium 7 (Infection)
Session Topic : Antibiotic Stewardship in Transplant Setting
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-2

Antibiotic Stewardship: Pharmacist's Role

Eunjeong Heo
Seoul National University Bundang Hospital, Republic of Korea

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The CDC outlines seven core elements that form the foundation of an effective antibiotic stewardship program. One key element is "Pharmacy Expertise," which emphasizes the pharmacist's leadership role. Pharmacists track and analyze antibiotic usage trends, ensuring their proper integration into stewardship programs. They also play a leading role in implementing interventions and collaborate closely with ASP physicians, prescribers, and other healthcare professionals. Moreover, pharmacists are heavily involved in educating prescribers, nurses, patients, hospital administrators, and all hospital staff on antibiotic use and stewardship principles. In the context of solid organ transplantation, prophylactic antibiotics are vital for preventing surgery-related infections and opportunistic infections due to immunosuppressant use. Transplant candidates, such as those with organ failure, often have a history of antibiotic exposure and hospitalization, increasing their risk for multidrug-resistant organisms. To ensure successful transplant outcomes, selecting the appropriate antibiotic, dosage, and duration is essential, alongside establishing infection prevention protocols and treatment plans. ASPs play a pivotal role in achieving these goals, contributing to better treatment outcomes and managing antibiotic resistance. Transplant patients require specialized antibiotic management, distinct from that of other hospital patients. Pharmacists on the stewardship team are involved in developing transplantation protocols, including decisions about antibiotic dosage, administration methods, formulation selection, and information on available antibiotics. They also optimize antibiotic use through prospective prescription reviews and provide tailored feedback to transplant teams. In South Korea, a pilot project for antibiotic stewardship management is set to begin in November, the first government-supported initiative. At Seoul National University Bundang Hospital, pharmacists have been actively involved in antibiotic stewardship since 2013, conducting prospective interventions. In particular, pharmacists have played a key role in updating transplantation protocols, offering prescription reviews, feedback, and consultations with transplant specialists and infectious disease physicians.

Keywords: Antimicrobial stewardship, Infectious diseases pharmacist, Clinical pharmacist,

Lecture Code : CC07-S4
Session Name : Concurrent Symposium 7 (Infection)
Session Topic : Antibiotic Stewardship in Transplant Setting
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 6F-2

Antibiotic Stewardship: Laboratory's Role

Kiho Hong
Severance Hospital, Republic of Korea

An antimicrobial stewardship program (ASP) is essential to control antimicrobial resistance and improve patient outcomes. The key element and foundation of an ASP is accurate and rapid microbial identification and antimicrobial susceptibility testing, without which the next steps of an ASP cannot take place. Currently, there are several ASP guidelines published for emergency departments and ICUs, which also include recommendations for diagnosis. However, there is no ASP guideline or consensus for transplantation patients. In this presentation, I will review the effectiveness of rapid ID and AST in ASP and how it is currently being utilized in South Korea.

Keywords: diagnosis, antimicrobial stewardship, susceptibility, identification, diagnostic stewardship

Lecture Code : CC08-S3
Session Name : Concurrent Symposium 8 (Lung)
Session Topic : Consideration of High-Risk Candidate
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-3

Effect of Lung Transplant of Malnutrition (Low BMI) Recipient

Hye Ju Yeo
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End-stage lung disease is frequently linked to malnutrition, with low body mass index (BMI) significantly impacting lung transplant outcomes. According to the 2021 ISHLT guidelines, a BMI <16 kg/m² is considered high-risk, and even a BMI of 16–17 kg/m² poses substantial risk. Patients with BMI <18.5 kg/m² are at elevated risk both pre- and post-transplant. Preoperatively, they face higher mortality due to severe disease, infection susceptibility, and frailty, worsening perioperative outcomes. Post-transplant, malnourished patients experience increased early mortality, prolonged mechanical ventilation, and postoperative infections. Immune dysfunction, reduced muscle mass, and poor nutritional reserves contribute to delayed recovery and greater susceptibility to complications like primary graft dysfunction and bronchiolitis obliterans syndrome, leading to worse survival compared to those with normal BMI. However, the impact of low BMI on survival is complex, varying with the underlying disease. For instance, underweight cystic fibrosis patients generally do not have increased mortality, while those with chronic obstructive pulmonary disease face higher risks. Solely using BMI as an exclusion criterion may not optimize organ allocation. The lack of robust data on underweight patients highlights the need for reconsideration of transplant thresholds. Nutritional optimization before transplant and postoperative support, through multidisciplinary approaches, are essential for improving outcomes in low-BMI lung transplant candidates. In conclusion, while malnutrition presents significant challenges in lung transplantation, addressing nutritional deficits can enhance both survival and quality of life, underscoring the importance of thorough risk assessment in transplant candidates.

Keywords: malnutrition, low body mass index , lung transplant , survival

Lecture Code : CC08-S4
Session Name : Concurrent Symposium 8 (Lung)
Session Topic : Consideration of High-Risk Candidate
Date & Time, Place : November 15 (Fri) / 15:10-16:40 / Room 5F-3

How to Overcome Short Stature Candidate

Daisuke Nakajima
Kyoto University, Japan

In living-donor lobar lung transplantation (LDLLT), adult lower lobes may be too large for pediatric patients with short stature. We have recently employed single-lobe or segmental lung transplant procedures for managing oversized grafts. Single LDLLT was conducted for 14 small pediatric patients including 5 males and 9 females with a median age of 8 (range: 3-13) years and a median height of 114.5 (range: 97.8-140) cm. Median functional size matching with forced vital capacity (FVC) was 69.4 (range: 38.0-94.6)%, and median anatomical size matching with 3D-CT volumetry was 187.2 (127.3-276.2)%. Delayed chest closure was required in 7 cases and contralateral pneumonectomy was required in 1 case. One patient underwent contralateral single LDLLT on 17 days after transplantation because of PGD and died on 3 months after re-single LDLLT. Chronic lung allograft dysfunction developed in 3 cases, and re-transplantation was performed in 2 cases. The 1-, and 5-year survival rates after single LDLLT were 92.3%. Bilateral segmental lung transplant procedure, using a basal segmental and/or an S6 segmental grafts, was performed for 7 small pediatric patients including 5 males and 2 females with a median age of 7 (range: 4-15) years and a median height of 115 (range: 95-126.4) cm. Median FVC size matching was 120.0 (range: 38.3-138.7)%, and median CT volumetric size matching was 185.7 (range: 95.4-381.7)%. Delayed chest closure was required in 6 cases. Two patients required extracorporeal membrane oxygenation support after transplantation for managing PGD due to congestion in the rotated S6 grafts. One patient died on 14 days after transplantation because of PGD. The 1- and 5-year survival rates after segmental lung transplantation were 83.3% and 62.5%, respectively. Single-lobe and segmental lung transplantation can be useful procedures to solve the issue of graft size mismatch in pediatric patients with short stature, showing acceptable posttransplant outcomes.

Keywords: living donor, lung transplantation, single lobe, segmental

Lecture Code : MTP02-S1
Session Name : Meet the Professor 2 (Liver)
Session Topic : -
Date & Time, Place : November 16 (Sat) / 07:30-08:30 / Room 6F-1

Minimal Invasive Recipient Surgery: How Far Could We Go?

Kyung-Suk Suh
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To overcome a shortage of deceased organ donation, living donor liver transplantation (LDLT) has been developed and accepted as an alternative to deceased donor liver transplantation (DDLT) for patients with end-stage liver disease. Unlike DDLT, the safety and requirements of the live donor should also be considered in LDLT. As experience grows and surgical techniques evolve, pure laparoscopic hepatectomy has become a new option considering the donor's increasing cosmetic and functional demands. Since introducing flexible 3-dimensional laparoscope into liver surgery in 2015, laparoscopy-assisted technique was more frequently used in donor hepatectomy and in November 2015, first pure laparoscopic donor right hepatectomy was performed. We performed pure laparoscopic donor hepatectomy in selected donors with no anomalies of the bile duct or portal vein until February 2016. However, since March 2016, with accumulation of experience and introduction of indocyanine green (ICG) near-infrared fluorescence camera for real-time demarcation and cholangiography, more than 90% donor hepatectomies were performed using pure laparoscopic method without any special selection criteria. Our center, Seoul National University Hospital, has performed more than 400 cases of pure laparoscopic donor hepatectomies, most of which are right hepatectomies, and more than 2300 cases of LT including about 1600 cases of living donor liver transplantation (LDLT). Based on the experience of the surgeon and the team, we have initiated a minimally invasive LDLT program since March 2020 and successfully performed pure laparoscopic explant hepatectomy and graft implantation using upper midline incision as the first step of the program. As for the next stage of the program, we successfully performed pure laparoscopic LDLT including both explant hepatectomy and reconstruction of the vessels and bile duct. And then robotic system was introduced for arterial and biliary anastomosis. This operation is still experimental but in near future it might be standard surgery in LDLT.

Keywords: minimally invasive, liver , living related , transplantation, surgery

Asian Transplantation Week 2024
Challenges and Opportunities in Asian Transplantation
Nov. 14(Thu)~16(Sat), 2024 | Conrad Seoul, Korea

Lecture Code: MTP02-S2
Session Name: Meet the Professor 2 (Liver)
Session Title: -
Date & Time, Place: November 16 (Sat) / 07:30-08:30 / Room 6F-1

ABO-Incompatible Living-Donor Liver Transplantation

Hiroto Egawa

Hamamatsu Rosai Hospital, Japan

ABO-incompatible (ABO-I) liver transplantation is an alternative to living-donor liver transplantation (LDLT). The ABO barrier in kidney transplantation fell rapidly thanks to Professor Alexandre's pioneering efforts. However, considering the miserable outcomes for liver transplantation in general, ABO-I liver transplantation was initially limited to highly select patients. Many technical innovations were accomplished in the field of living-donor liver transplantation (LDLT). Strategies to prevent antibody-mediated graft rejection (AMR) after ABO-I LDLT were developed and established. Increases in the safety of ABO-I LDLT expanded ABO-I LDLT primarily to Asia, where LDLT is the predominant form of LT owing to the scarcity of brain-dead donors, and where ABO-I LDLT now accounts for approximately 20% of all LDLT procedures. The desensitization protocol consisting of rituximab, plasma pheresis, tacrolimus, and mycophenolate mofetil prior to LDLT, followed by standard immunosuppression, is currently the best option in terms of safety and efficacy. There was no negative impact of rituximab on the recurrence of hepatocellular carcinoma. Despite effective desensitization protocol including rituximab, once the process of AMR is initiated, rituximab is ineffective. Early diagnosis of AMR through liver biopsy, followed by treatment involving a steroid pulse, plasma pheresis, and IVIG, is practical. Plasma cell–depleting agents, such as the proteasome inhibitor bortezomib, may be used in ABO-I LT recipients with caution as treatment of AMR. In addition to decreasing the amount of antibody, a treatment for decreasing or eliminating post-transplantation inflammation might ameliorate the epithelial injury that leads to fatal AMR. The feasibility of rituximab for LDLT for acute liver failure has been documented and could be considerable even for deceased donor liver transplantation. In the era of rituximab prophylaxis, change of antibody titer is not so sensitive marker of AMR. We need to develop sensitive biomarker for early diagnosis of AMR and for assessment of effect of treatment.
Keywords:

Lecture Code : MTP03-S1
Session Name : Meet the Professor 3 (Heart)
Session Topic : -
Date & Time, Place : November 16 (Sat) / 07:30-08:30 / Room 6F-2

Heart Transplantation in Taiwan

Yih-Sharng Chen
National Taiwan University Hospital, Taiwan

Heart Transplantation in Taiwan: Developments and Challenges Since the first successful heart transplant at National Taiwan University Hospital (NTUH) in 1987, Taiwan has achieved a cumulative total of 2,039 heart transplants by 2023. NTUH has pioneered heart transplantation advancements and continues leading this field in Taiwan. By employing innovative surgical techniques and mechanical circulatory support (MCS) devices, such as extracorporeal membrane oxygenation (ECMO) and ventricular assist devices (VAD), NTUH has made significant strides in managing end-stage heart failure and improving patient outcomes. These efforts have led to favorable survival rates, with rigorous patient selection and post-operative care protocols further enhancing transplant success. MCS has become an essential support system for patients awaiting heart transplants. NTUH has enhanced the survival and quality of life for even the most critical patients by providing both short-term and long-term options, including ECMO and durable VADs. The Taiwanese healthcare system has also expanded reimbursement policies to cover certain MCS devices, improving accessibility for patients with advanced heart failure. However, post-transplant care poses challenges, primarily due to complications like rejection and infections. These complications often lead to high readmission rates, especially within the first few years post-surgery. To address this, NTUH has implemented immunosuppression protocols to reduce the likelihood of rejection by regularly monitoring serum drug levels and adjusting treatments based on individual patient needs. Although rejection episodes typically occur within two years of transplantation, effective management has yielded promising long-term survival rates.

Despite these successes, Taiwan faces significant financial challenges related to the high costs of heart transplantation and MCS therapies. As healthcare expenditures continue to grow, optimizing the cost-effectiveness of these treatments has become crucial. To enhance resource efficiency, Taiwan has begun refining its selection criteria for MCS candidates, prioritizing patients who would gain the most from these life-extending treatments. A key issue that Taiwan must address is its low organ donation rate, estimated at just 5 per million people—a figure much lower than in Western countries. This gap has driven the development of MCS as a viable alternative or bridge to transplantation. NTUH and other institutions are actively exploring strategies to boost organ donation rates and improve waiting list management by prioritizing urgent cases and using MCS devices to stabilize patients while they await an available organ. Moving forward, NTUH is committed to advancing heart transplantation and MCS in Taiwan, continuously innovating to meet the rising demand for heart failure treatments. As technology improves and MCS costs decrease, Taiwan's healthcare system is well-positioned to broaden access to these therapies, thereby improving survival rates and enhancing the quality of life for heart failure patients.

Keywords: heart transplantation,, taiwan, , immnuosupressant, infection, rejection

Lecture Code : MTP03-S2
Session Name : Meet the Professor 3 (Heart)
Session Topic : -
Date & Time, Place : November 16 (Sat) / 07:30-08:30 / Room 6F-2

My Life as Cardiovascular Pathologist

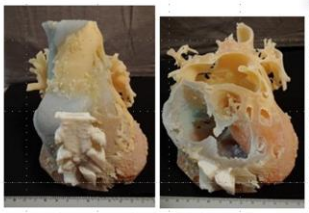
Jeong-Wook Seo
Incheon Sejong Hospital, Republic of Korea

The heartmuseum.kr is a collection of heart specimens and others. The aim of the museum is to collect, preserve, present and research on the heart. The customers are professionals on cardiology as well as the general public. Customers are requested to understand, experience and think on the past, current and future of the heart. Heart specimens at "heartmuseum.kr" are collected from three major sources: 1) the autopsy, 2) the transplantation and 3) the three-dimensional(3d) modeling based on clinical imaging data. Real heart specimens are preserved in formalin solution and some of them are paraffinized or plastinized for display. The 3d modeled hearts are preserved and displayed in 3d printed forms and virtual reality. Specimens with congenital heart disease were major parts of the heart collection in 1980's but current major parts are those with the adult cardiac diseases and normal hearts for training professionals on cardiac imaging and arrhythmia. Other collections at "heartmuseum.kr" include hardware (machines and devices that are relevant to the medical practices and researches on cardiology) and software (media including memorial records, books and presentation materials). Heart specimens and others are used for three major customers. The first group is professionals at the scientific sessions of the congresses on echocardiography, intervention, surgery as well as general cardiology. We also run an annual international congress "Asia Pacific Cardiovascular Intervention and Surgery (APCIS)". The second is visitors at the heartmuseum.kr. The third group includes educational and training sessions at the inhouse or outreach programs. My education of cardiac pathology for undergraduate students was a truly valuable work. Different approaches were successfully performed. Autopsy service is not a popular process but a greater value of autopsy can be reached by value-up works to fill the small gap between the clinical and pathological findings.

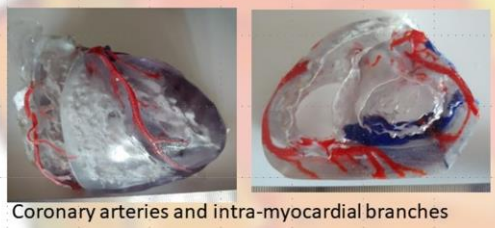
Keywords: heart museum, education of cardiology, 3d printing, autopsy

displayed for visitors.png

Hearts displayed for visitors



3d printed and colored



Coronary arteries and intra-myocardial branches

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Hearts for medical professionals

Video recordings of individual hearts are accessed at YouTube channel @apcisvideo or QR code.
Chinese version on anatomy for arrhythmia produced by Hsuan Ming Chao and Jeong-Wook Seo
English lecture on congenital heart disease produced by Haysam Baho and Jeong-Wook Seo.

Education and training on 3d anatomy and pathology are crucial part of cardiology programs.
Images, videos, 3d models, virtual reality are useful as an aid to the real hearts.

House keeping maintenance of the formalin fixed hearts is our honorable mission.

Lecture Code : CC09-S1
Session Name : Concurrent Symposium 9 (Kidney/Pancreas)
Session Topic : Debate in Pancreas Transplantation
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 3F-1

PTA vs Artificial Pancreas (PTA)

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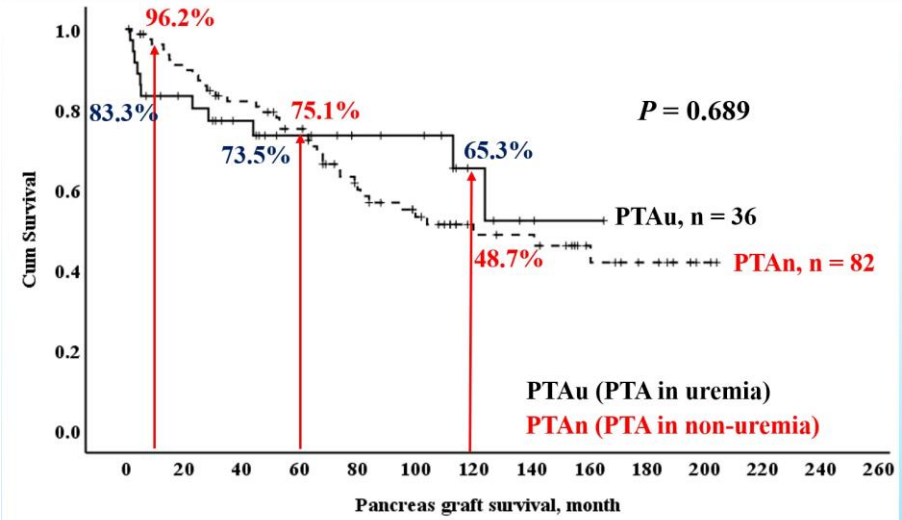
Background: Theoretically, pancreatic transplant alone in uremia (PTAu) or pancreas before kidney transplant (PBK) could also be considered for those waiting for both pancreas and kidney grafts, in addition to the options of simultaneous pancreas-kidney transplant (SPK) and pancreas after kidney transplant (PAK). Methods: A total of 184 cases of pancreas transplant were performed, including 120 (65%) PTA, 40 (22%) SPK, and 24 (13%) PAK. Outcomes of PTAu and pancreas transplant alone in non-uremia (PTAn) were compared. Results: Among the 120 PTA, there were 38 (21%) PTAu and 82 (44%) PTAn. Rejection of pancreas graft was much lower in the PTAu, as compared with PTAn (5.3% vs. 41.5% for over rejection). Majority of the graft loss in PTAn group were due to rejection (83.8%), especially chronic rejection (67.6%), whereas the most common cause of graft loss in PTAu was death with functioning graft (83.3%). Fasting blood sugar (FBS) levels were comparable between PTAu and PTAn. HbA1c levels were significantly lower after pancreas transplant in the PTAu group. Pancreas graft survival outcomes after PTAu was better than those of PTAn group if graft loss due to patient death with functioning graft was regarded as "censor" (1-, 5-, 10-year: 97.1%, 97.1%, 97.1% vs. 96.2%, 78.5%, 50.9% respectively). However, the superiority of graft survival in the PTAu group was not noted when graft loss due to patient death with functioning graft was considered as "event" of interest. Patient survival outcome was inferior in the PTAu group, as compared with those in PTAn. Conclusions: Pancreas transplant first in the diabetic and uremia patients, PTAu or PBK, is feasible in terms of endocrine, immunological, and graft survival outcomes. It could be an option if SPK or PAK are not available; however, subsequent kidney transplant following a successful pancreas transplant (KAP) should be encouraged whenever possible.

Keywords: PTAu, PTAn, Pancreas transplant alone, uremia

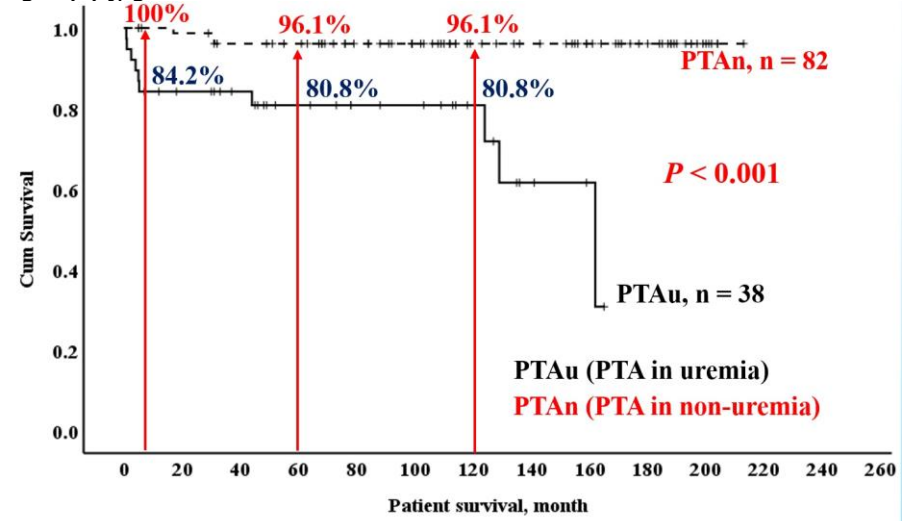
Fig. 2(b).jpg



Pancreas Transplant	Median (mon.)	Range (mon.)	Mean±SD (mon.)	1-year survival	5-year survival	10-year survival	P value
PTAu, n = 36	47	2 – 165	62±48	83.3%	73.5%	65.3%	0.689
PTAn, n = 82	73	1 – 204	85±57	96.2%	75.1%	48.7%	

*Survivals: graft loss due to patient death with functioning graft was considered as "event"; technique failure and surgical mortality were not included

Fig. 2(b).jpg



Pancreas Transplant	Median (mon.)	Range (mon.)	Mean±SD (mon.)	1-year survival	5-year survival	10-year survival	P value
PTAu, n = 38	58	1 – 165	71 ± 53	84.2%	80.8%	80.8%	< 0.001
PTAn, n = 82	116	1 - 213	122 ± 60	100%	96.1%	96.1%	

Lecture Code : CC09-S2
Session Name : Concurrent Symposium 9 (Kidney/Pancreas)
Session Topic : Debate in Pancreas Transplantation
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 3F-1

PTA vs Artificial Pancreas (Artificial Pancreas)

Chang Hee Jung
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Successful pancreas transplantation can normalize glucose levels and mitigate microvascular complications of type 1 diabetes. However, people receiving this treatment require lifelong immunosuppression to prevent graft rejection and/or recurrence of autoimmune islet destruction. Given the potential adverse effects of immunosuppressive therapy, pancreas transplantation is recommended for those who will undergo simultaneous kidney transplantation or following kidney transplantation, or for those with recurrent ketoacidosis or severe hypoglycemia despite intensive glycemic management. With the advancement of Continuous Glucose Monitoring System (CGMS) technology, it has become possible to continuously and relatively non-invasively measure blood glucose levels in real-time. Along with this, the technology for connecting with insulin pumps has also evolved. Initially, features were introduced to stop insulin infusion during hypoglycemia, and later, functions were added to halt insulin delivery when hypoglycemia is predicted. Currently, insulin pumps are commercially available and widely used, where basal insulin is automatically adjusted by algorithms embedded in the insulin pump. In contrast, bolus insulin is manually administered based on the amount of carbohydrates the patient enters. In this lecture, we will introduce the clinical efficacy of such automated insulin delivery systems and explore other systems currently under development. Additionally, we will discuss whether these technologies could potentially replace pancreatic transplantation.

Keywords: automated insulin delivery, CGMS, artificial pancreas, pancreas transplantation , insulin pump

Lecture Code : CC09-S3
Session Name : Concurrent Symposium 9 (Kidney/Pancreas)
Session Topic : Debate in Pancreas Transplantation
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 3F-1

SPK vs PAK (SPK)

Kyo Won Lee
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Simultaneous Pancreas-Kidney Transplantation (SPKT) and Pancreas After Kidney Transplantation (PAK) are two options for patients with Type 1 diabetes and end-stage renal disease (ESRD). SPKT involves a single surgery, transplanting both kidney and pancreas at the same time from a deceased donor, allowing for a unified recovery process that reduces hospitalization time and physical strain. PAK, in contrast, separates the transplants into two stages, starting with a kidney transplant followed by a pancreas transplant. This approach can restore kidney function initially but comes with the added risks of a second surgery, such as increased chances of infection or rejection. SPKT has a significant advantage in glycemic control, providing immediate and sustained normoglycemia, which is key to preventing complications like cardiovascular disease, neuropathy, and retinopathy. PAK patients may experience a delay in achieving such control, which can expose them to prolonged complications related to diabetes. SPKT also simplifies immunosuppressive management by using a single protocol for both organs, reducing the complexity and risks associated with medication adjustments required in PAK. This can help avoid sensitization, which could otherwise increase the rejection risk in PAK's staged approach. In terms of outcomes, SPKT has shown better long-term survival and quality of life due to the simultaneous resolution of kidney and pancreas issues. Patients benefit from reduced insulin dependence and improved metabolic control, contributing to a decrease in cardiovascular risks and greater independence from diabetes management. Economically, while SPKT may involve higher initial costs due to the complexity of the procedure, it is more cost-effective over time. It reduces overall hospitalization expenses, limits the need for further interventions, and avoids the costs of a second surgery. In contrast, PAK's two-stage process can lead to higher cumulative costs from additional hospital stays and surgical needs. Overall, SPKT is preferred for patients with Type 1 diabetes and ESRD due to its comprehensive benefits, including immediate glycemic control, streamlined immunosuppression, and improved patient outcomes, making it a more effective long-term solution.

Keywords: SPKT, PAK , type 1 diabetes, ESRD, normoglycemia

Lecture Code : CC09-S4
Session Name : Concurrent Symposium 9 (Kidney/Pancreas)
Session Topic : Debate in Pancreas Transplantation
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 3F-1

SPK vs PAK (PAK)

Byung Hyun Choi
Pusan National University Yangsan Hospital, Republic of Korea

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SPK is the most commonly performed pancreas transplant procedure globally and is considered the optimal treatment for patients with insulin-dependent diabetes and end-stage renal disease. This approach offers significant advantages, including a single surgery and fewer immunological complications, since both the pancreas and kidney come from the same donor. Immunosuppressive therapy is also more streamlined, as the recipient only requires induction once. However, the downside of SPK is the long waiting time due to the global shortage of deceased donors. In countries like Korea, where the demand for kidney transplants is high and waiting periods for deceased donor kidneys can exceed 6.2 years, the availability of SPK is limited. Additionally, there are only a few centers capable of performing pancreas transplants, further contributing to the long waiting time. PAK, on the other hand, involves two separate transplant surgeries: one for the kidney and later one for the pancreas. While this procedure allows patients to receive a kidney transplant first without waiting for a simultaneous pancreas, it comes with several drawbacks. These include the need for a second major surgery, higher immunological risks due to different donors, and increased immunosuppression levels, which can lead to long-term complications. However, despite these limitations, PAK can be a practical solution for patients, particularly in countries where pancreas availability is higher or the wait time for SPK is excessively long. In countries with significant donor shortages, PAK provides a shorter waiting period for pancreas transplants compared to SPK, which can make it a more viable option. While SPK is the preferred method due to its comprehensive benefits, PAK remains a crucial alternative, especially in regions where access to simultaneous donor organs is limited.

Keywords: Pancreas Transplant, Kidney Transplant, SPK, PAK, Best option

Lecture Code : CC10-S1
Session Name : Concurrent Symposium 10 (Liver)
Session Topic : Techniques to Increase the Utility of Liver Graft
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-1

Ischemia-free Liver Transplantation

Zhiyong Guo
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Organ transplantation is one of the miracles in medicine in the 20th century. However, in the current practice, all the donor organs suffer from ischemia/reperfusion injury (IRI), which compromise transplant outcomes, limits organ availability, and increase cancer recurrence. In 2017, ischemia-free organ transplantation (IFOT) was first proposed by our group with the aim of complete avoidance of IRI in organ transplantation. The feasibility of IFOT has been validated in liver, kidney, and heart transplantation. The results of the first non-randomized controlled study demonstrate that ischemia-free liver transplantation (IFLT) can improve transplant outcomes and increase organ availability. Furthermore, laboratory results demonstrate the absence of the characteristic pathological changes, gene transcription, and metabolic reprogramming, as well as sterile inflammation activation in IFLT grafts, suggest the virtual avoidance of graft IRI in IFLT. Recently, our group found that the recurrence-free survival has been substantially improved in IFLT recipients. We are now working on the molecular mechanisms by which IFLT might reduce cancer recurrence.

Keywords: ischemia-free liver transplantation, ischemia-reperfusion injury, organ medicine, allograft rejection, cancer recurrence

Lecture Code : CC10-S2
Session Name : Concurrent Symposium 10 (Liver)
Session Topic : Techniques to Increase the Utility of Liver Graft
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-1

DCD and Machine Perfusion

Andrea Schlegel
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Liver transplantation using donation after circulatory death (DCD) donors offers a promising solution to alleviate organ shortages, yet carries inherent risks, particularly from ischemia-reperfusion injury and biliary complications. Key factors influencing DCD transplant outcomes include donor risk profiles, donor warm and cold ischemia times, and careful matching with recipient risk. This presentation will discuss these factors alongside advancements in organ preservation, with a focus on currently leading machine perfusion technologies that are reshaping DCD liver preservation. The introduction of machine perfusion tools has led to improvements in graft preservation. Hypothermic oxygenated (HOPE) and normothermic machine perfusion (NMP) are the two main dynamic ex-situ perfusion approaches currently used in clinical practice. While HOPE was shown to reduce ischemia-reperfusion injury and related complications after liver transplantation, NMP is mainly utilised to reduce cold ischemia time and for viability assessment. Mitochondrial function is key for cells to recover from ischemia and provide molecules released durign reperfusion usefulf for viability assessment. Flavinmononucleotide (FMN) appears as attractive molecule, easily quantifyable during any typt of machine perfusion, and correlating with graft survival, complications and costs. This presentation will discuss such features and highlight the role of viability assessment in context of different donor-recipient risk profiles. By addressing these elements, we can pave the way for safer expansion of the donor pool and better outcomes in DCD liver transplantation.

Keywords: DCD, donor warm ischemia time, HOPE, NMP, FMN

Lecture Code : CC10-S3
Session Name : Concurrent Symposium 10 (Liver)
Session Topic : Techniques to Increase the Utility of Liver Graft
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-1

Adult Split DDLT - Surgical and Practical Issues

Young Kyoung You
The Catholic University of Korea, Korea

Liver transplantation on the human was launched at 1963 by Starzl. Initial empirical trial of liver transplantation for the human had been approved as one of the standard treatment modalities for the various kinds of end stage liver disease at 1980s. One of the various methods to alleviate organ shortage in liver transplantation, split liver transplantation was introduced late 1980s. Even the successful surgical technique of the split liver transplantation, the outcome of historical first two adult split liver transplantation recipients in French group was not satisfactory. Both the recipients who suffering fulminant hepatitis were died after transplantation POD 20 due to multi-organ failure and POD 45 due to CMV infection, respectively. Split liver techniques eventually applied for one adult of extended right liver graft and the other child of left lateral section.

In the pediatric liver transplantation, left lateral liver section of splitting whole liver graft from brain death donor has been a suitable option. However, in the adult recipient, relatively small split liver graft either right of left might not satisfy the functional liver volume to the recipient. Comparable small liver graft should be matched to the individual who is not in urgent situation and small in body. Nearly 80 % of the liver transplantation in Korea has been performed using living related donor. Number of deceased organ donation is gradually decreasing due to cultural and social reasons. Waiting list mortality of patient with MELD score 40 has been took place commonly in the South Korea.

Not a few liver transplant centers have considered the organs from marginal donors for transplant backgrounded on this extreme scarcity of deceased donor organ. Liver graft from marginal donors such as elderly donor and high-risk donors based on clinical, laboratory and histologic data has been discarded in general. Split liver itself also regarded as marginal graft so far. Under the abundant experience of living donor liver transplantation, graft damage comes from the split procedure has been diluted. Herein we describe the experience of our adult split liver transplantation from eight deceased donors regarded as marginal liver grafts.

Lecture Code : CC11-S1
Session Name : Concurrent Symposium 11 (Coordinator)
Session Topic : 장기이식 코디네이터의 전문성과 앞으로 나아갈 방향
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 6F-1

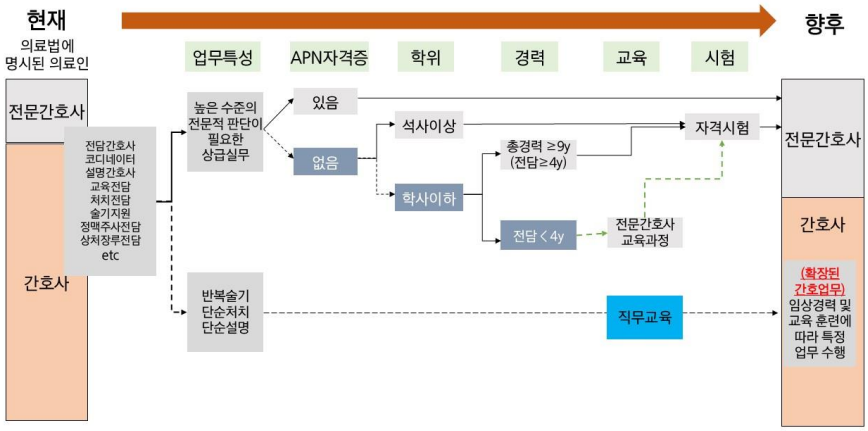
한국 전문간호사의 전망

Su Jung Choi
Sungkyunkwan University, Republic of Korea

우리나라 의료환경은 OECD 평균보다 높은 병상 수에 비해, 의사 수는 턱없이 부족하다. 많은 의료기관들이 의사들만으로는 의료수요를 해결할 수 없어서 수십년 전부터 전문간호사, 전담간호사, PA (physician assistant), SA (surgical assistant) 등 다양한 명칭의 간호인력이 진료지원업무를 수행해왔다. 그러나 의료법에 명시된 인력은 전문간호사 뿐이었고, 그나마도 업무범위가 불분명해서 불법 논란이 지속되어 왔다. 그러다 올해 초 의료계의 합의 없이 정부가 발표한 의대 정원 증원안에 반대해 수련의들이 병원을 떠나면서 보건의료 재난 상황이 발생하자, 전공의 공백을 채우기 위해 '간호사 업무 관련 시범사업'이 발표되었다. 시범사업은 간호사의 숙련도와 자격에 따라 전문간호사, 전담간호사, 간호사로 구분하여 진료지원 업무범위를 명확히 하였다. 이는 그동안 불법 의료행위로 간주되어 온 간호사의 진료지원업무에 대해 처음으로 정부가 입장을 내놓은 것이다. 더 나아가 9 월 20 일 새롭게 공포된 간호법에는 간호사의 진료지원업무와 자격 등에 대한 내용이 명시되었다. 또한 의료개혁특별위원회에서 상급종합병원 체질 개선을 위한 전문의 중심병원 전환 방안을 추진하면서, 전문의와 함께 팀으로 일하게 될 인력에 대한 논의도 진행 중이다. 이처럼 대한민국 의료계는 큰 위기의 상황에서 의료시스템의 전환을 도모하고 있고, 의료시스템의 변화는 의료인력의 역할과 업무에도 변화가 따르고, 업무 수행에 대한 자격과 권한, 책임도 함께 요구될 것이다. 따라서 간호계는 현장의 요구는 무엇인지, 진료지원업무 수행을 위해서 필요한 역량이 무엇인지를 파악하여 장기적인 관점에서 면허, 인증, 교육, 훈련, 시험, 규제 등 갖춰야 할 체계에 대해 논의할 필요가 있다. 현재 의료법에 명시되어 있는 간호사와 전문간호사를 활용하여 난이도가 높은 업무를 수행하는 진료지원인력에 대해서는 특례 자격으로 시험을 통해 전문간호사제도로 전환할 수 있는 방안을 마련하고, 진료지원업무 중 일부는 간호사가 수행 가능한 업무범위로 확대하여 체계를 갖출 필요가 있다(그림 1). 전문간호사는 임상간호사와 의사의 그 중단간계에서 상급실무를 수행하면서, 전문가적 판단과 임상적 의사결정을 통해 대상자를 위한 최상의 간호를 제공함과 동시에 관련 의료진과 협업하고, 다양한 업무를 조정해온 질적 인력이다. 전문간호사제도를 활용한다면 진료지원인력의 현재 애매한 위치를 이미 제도화된 시스템 내에서 해결하는 기회를 제공하는데 매우 중요한 초석이 될 것이다. 간호계는 진료지원업무의 합법적 지속성을 유지하기 위해 진료지원인력이 반드시 갖추어야 할 역량에 대해 심도 있게 논의하고, 시간이 걸리더라도 환자 안전을 위한 가장 최선의 정책을 마련할 필요가 있다.

Keywords: 전문간호사, 진료지원업무, 자격, 전망

그림 1 간호사 진료지원업무의 합리적 해결 방안.jpg



Lecture Code : CC11-S4
Session Name : Concurrent Symposium 11 (Coordinator)
Session Topic : 장기이식 코디네이터의 전문성과 앞으로 나아갈 방향
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 6F-1

The Experience of Senior Coordinator 1

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장기이식은 기증된 건강한 장기를 말기 장기부전환자들에게 안전하게 이식하는 매우 복잡하고, 고도의 지식과 기술을 요하는 일련의 과정이다. 국내에서는 1969 년에 생체 신장이식이 처음 시행된 후 주로 가족 간의 생체 신장이식이 이루어졌으나, 1991 년부터 여러 병원들이 뇌사 장기이식을 준비하면서 한 명의 뇌사자로부터 여러 명의 수혜자가 생기게 되므로 이런 과정에서 장기이식코디네이터의 필요성이 제기되었다. 1992 년 당시 우리나라에서는 장기이식코디네이터가 생소했으나 외국에서는 이미 활성화된 분야였다. 필자가 장기이식코디네이터로 추천을 받았을 때는 전혀 알지 못했던 분야라 업무와 역할에 관하여 막연했으나 간호의 새로운 분야에 대한 호기심과 도전으로 국내 1 호 장기이식코디네이터의 길로 들어서게 되었다. 1992 년 3 월부터 장기이식코디네이터 업무를 시작하게 되어, 독일 하노버대학병원으로 간이식 연수를 가게 되어 그곳에서 간이식을 처음 접하게 되었고, 장기이식코디네이터의 역할도 배울 수 있었다. 연수를 마치고 돌아온 후, 서울아산병원에서는 본격적으로 뇌사 장기이식과 간이식, 췌장이식, 심장이식 준비를 하여 1992 년 뇌사 간이식, 국내 최초 뇌사 췌장이식과 심장이식 등을 시행하였으며, 그 과정에서 장기이식코디네이터의 역할을 하나씩 정립하였다. 장기이식코디네이터란 장기이식의 전체 과정을 중재하고 조정하고 촉진하는 의료인으로서 기증자 확보와 확인부터 장기 적출 과정, 수혜자 간호 및 퇴원 후 추후 관리까지의 전 과정을 담당하고 있다. 장기와 조직이식이 성공적으로 이루어지도록 이식 과정을 조정하고 의사소통을 제공하며 환자에게는 질적인 간호를 제공하고 증진시키며 간호의 계속성을 유지하게 된다. 장기이식코디네이터의 업무를 담당하다 보면 어려운 점도 상당히 많은 반면 전문성을 확보한 간호의 분야로서 인정받을 수 있고, 전문직으로 자신의 영역을 계속 개발해 나갈 수 있다는 점과 이식을 받은 환자들이 건강한 모습으로 사회에 복귀하고 남에게 베푸는 삶을 사는 모습을 볼 때 많은 보람을 느끼게 된다. 앞으로 장기 기증과 이식은 더욱 증가할 것이며, 평생 동안 장기이식코디네이터의 관리를 받아야 하는 이식 수혜자는 계속 그 수가 누적되고 높은 질의 간호를 필요로 할 것이다. 이러한 요구에 부응하기 위하여 장기이식코디네이터의 수가 증가되고, 업무도 더욱 세분화되고, 그 역할도 점차 확대되어야 하리라 생각된다. 계속적인 장기이식코디네이터의 전문성 발전을 위하여, 장기이식코디네이터는 충분한 자격과 능력을 갖추어야 하며, 역할 확대를 위하여 자격 기준의 마련과 체계적인 교육과정이 더욱 발전되기를 기대한다.

Keywords: 장기이식 , 장기이식코디네이터, 전문성, 역할 확대

Lecture Code : CC11-S5
Session Name : Concurrent Symposium 11 (Coordinator)
Session Topic : 장기이식 코디네이터의 전문성과 앞으로 나아갈 방향
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 6F-1

The Experience of Senior Coordinator 2

KyoungOk Jeon
Severance Hospital, Republic of Korea

전문직이란 높은 수준의 교육을 받고 고도의 지식, 기술적 차원의 능력을 갖춘 전문인들이 합리성에 근거하여 업무를 수행하면서 중요한 사회적 공헌을 하는 직업으로 정의되고 있다. 파발코가 제시한 전문직의 기준은 이론이나 지적기술이 있어야 하며 기본적 사회가치와의 관련성이 있으며 훈련 또는 교육기간이 장기간일수록 고도의 전문직 활동이라 할 수 있다고 한다. 또한 선택 동기가 이타적이며 자율성이 있어야 하고 종사기간이 장기적이며 공동체 의식과 전문적 윤리강령이 있어야 한다고 제시하고 있다. 파발코가 제시한 위의 8 개 기준의 연속선상에서 간호가 전문직으로 발전해 온 정도를 확인할 수 있으나 국내에서 간호의 위상은 전문직으로 자리매김하는데 아직 부족한 부분이 있고 학자들이 제시한 전문직 기준에서 한국간호는 자율성 결여로 이직의 주요 원인이 되고 간호가 career 로 인식되는 수준에 머물고 있는게 현실이다. 임상간호 업무는 실무에서의 자율성이 매우 제한적이다. 그러나 장기이식코디네이터의 업무는 전문직의 기준에 부합되며 업무에서 자율성까지 확보되어 간호의 여러 분야 중 많은 전문성을 갖춘 분야라고 할 수 있다. 장기이식코디네이터의 업무는 병상가까이서 환자를 돌보지는 않지만 의료적, 행정적, 법적으로 환자들이 이식이나 기증에 이를 수 있도록 전인간호하는 분야이다. 현재 보건의료계는 중증, 만성 질환자 증가로 간호사의 비판적 사고를 요구하고 다학제간 접근을 계기로 조정자로서의 간호사의 역할을 기대하고 있다. 장기이식코디네이터는 이러한 보건의료계의 조정자로서의 간호사로 앞서 나가고 있었으며 이를 바탕으로 이제는 보건의료인에서 보건의료전문직으로 거듭나야 할 시점에 있다고 생각된다. 전문간호사 제도의 편입과 더 나아가서 별도의 자격제도 수립, 표준화된 교육체계 확립은 필수적이며 역할 확대를 통한 자율성 증진과 더불어 관련전문인과 협력을 통한 발전을 이루어 나가야 할 것으로 사료된다.

Keywords: Transplant coordinator, nurse specialist, certificate, Experience, Leader

Lecture Code : CC12-S2
Session Name : Concurrent Symposium 12 (Laboratory)
Session Topic : Further Considerations on On-Going Issues
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-2

Desensitization in Highly Sensitized Patients: Laboratory Considerations and AST STAR Working Group Update

Anat Tambur
Northwestern University , United States

In this presentation we will discuss the principles guiding the STAR working group and the different topics covered by this collaborative effort between the American Society for Transplantation and the American Society for Histocompatibility and Immunogenetics. We will focus on information derived from the group analyzing HLA antibody testing for the purpose of supporting assessment of treatment efficacy for antibody removal therapies, whether for the purpose of desensitization of treatment of ABMR with summery and recommendations from the 2022 working group, and initial insight into the progress of the STAR 2025 working group. This working group had presented its preliminary product during the October 2024 webinars hosted by the AST and will have their final product presented at the face-to face STAR meeting in February 2025.

Keywords: Highly sensitized, HLA, Antibody, Desensitization , STAR

Lecture Code : CC12-S3
Session Name : Concurrent Symposium 12 (Laboratory)
Session Topic : Further Considerations on On-Going Issues
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-2

Clinical Significance of Non-HLA Antibody Test: Is it Mandatory for Pre-Transplant Evaluation?

Minjeong Nam
Korea University Anam Hospita, Republic of Korea

Antibody-mediated rejection (AMR) remains a major cause of kidney allograft failure, traditionally linked to donor-specific antibodies (DSA). However, AMR histopathology and chronic rejection markers such as transplant glomerulopathy have been observed without circulating DSA, leading to an increased focus on non-HLA antibodies in recent years. Non-HLA antibodies, including those targeting angiotensin II type 1 receptor (AT1R) and other endothelial antigens, have been associated with allograft rejection and poor outcomes. However, their clinical significance remains controversial, and there is no consensus on whether routine pre-transplant testing for non-HLA antibodies is necessary. Human leukocyte antigens (HLA) have been the primary target in managing acute and chronic AMR in transplantation. However, growing clinical evidence indicates that non-HLA antibodies, particularly anti-endothelial cell antibodies (AECAs), are often found in patients experiencing rejection, either independently or in combination with DSA. Although many studies have investigated the impact of AECAs on transplant outcomes, the clinical significance of non-HLA antibodies remains uncertain due to heterogeneous study designs, variations in testing methods, and differences in outcome measures. Firstly, to determine the clinical significance of non-HLA antibodies, the development of reliable and sensitive diagnostic assays for non-HLA antibodies is essential, particularly considering the technical challenges. Donor specificity must be considered to draw meaningful clinical conclusions from non-HLA antibody assays. Several solid-phase and cell-based crossmatch assays based on endothelial cells are currently available, either in research settings or for clinical use. Secondly, treatment protocols for highly HLA-sensitized patients, including desensitization therapies, plasma and B cell depletion, and complement inhibition, should be established to mitigate AMR. However, the efficacy of these treatments on non-HLA antibodies is still not well understood. Although non-HLA antibody clearance has been linked to improved graft function in some reports, there remains a need for standardized therapies and consistent monitoring of non-HLA antibodies to optimize long-term outcomes. In conclusion, routine pre-transplant testing for non-HLA antibodies can be implemented in clinical practice, contributing to improved risk stratification and better patient outcomes. Further studies will deepen the current

understanding of the mechanisms behind non-HLA antibodies and clarify their clinical significance.

Keywords: Non-HLA, Pre-transplant, Clinical significance, testing, DSA

Lecture Code : HW01-S1
Session Name : Heart Workshop
Session Topic : Perioperative Donor Management
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 6F-2

Registration Process of Recipient-Candidate

Hyo-In Choi
Kangbuk Samsung Medical Center, Republic of Korea

The heart transplant candidate registration process is a structured, multi-step approach prioritizing patients by medical urgency, compatibility, and transplant readiness. Central to this process is assessing medical urgency, as those with severe or life-threatening heart failure receive higher priority. For patients with advanced heart failure who face prolonged wait times due to organ scarcity, bridge therapies such as LVADs (Left Ventricular Assist Devices) provide mechanical circulatory support, stabilizing hemodynamics and extending survival. LVADs offer critical support, especially for those at risk of multi-organ failure, by reducing heart failure symptoms and enabling patients to maintain stability while awaiting transplant. However, LVAD use introduces considerations that can impact transplant readiness. Complications such as infections and thromboembolic events associated with LVADs require close monitoring, as they may affect a candidate's suitability and priority for transplantation. These risks underscore the importance of ongoing assessment to ensure LVAD-supported candidates remain viable for transplant. In parallel with medical urgency, compatibility is also evaluated to minimize post-transplant rejection risks. Compatibility focuses on matching blood type and basic immunologic factors, such as the major histocompatibility complex (MHC), to lower the likelihood of immune-mediated complications. In urgent cases, however, medical necessity may take precedence over full compatibility, ensuring that patients in critical need receive timely access to available organs, even if full immunologic matching is not immediately achievable. This patient-centered registration approach balances medical urgency with compatibility and readiness, applying bridge therapies like LVADs to extend survival during waiting periods. By prioritizing critically ill patients while accommodating individual clinical needs, the registration process aims to optimize transplant outcomes through a fair, adaptable, and effective allocation system.

Keywords: heart, donor, recipient, transplant, urgency

applying bridge therapies like LVADs to extend survival during waiting periods. By prioritizing critically ill patients while accommodating individual clinical needs, the registration process aims to optimize transplant outcomes through a fair, adaptable, and effective allocation system.

Keywords: heart, donor, recipient, transplant, urgency

Lecture Code : HW01-S2
Session Name : Heart Workshop
Session Topic : Perioperative Donor Management
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 6F-2

Immunosuppression During Perioperative Period

Jong-Chan Youn
The Catholic University of Korea Seoul St. Mary's Hospital , Republic of Korea

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Heart transplant is the optimal treatment for selected patients with end-stage heart failure. Immunosuppression after heart transplantation has significantly reduced the incidence of rejection and improved patient outcomes with the routine use of calcineurin inhibitors. Antimetabolites and proliferation signal inhibitors add to the improvement in patient outcomes as well. The goal of induction therapy is to provide intense immunosuppression when the risk of allograft rejection is highest. Most maintenance immunosuppressive protocols employ a three-drug regimen consisting of a calcineurin inhibitor, an antimetabolite agent and glucocorticoids. The management of rejection proceeds in a stepwise fashion based on the severity of rejection detected on biopsy and the patient's clinical presentation. This presentation will cover induction, maintenance, rejection therapy and some special considerations. It will end in consideration of potential future directions in immunosuppressive strategies to promote patient and graft survival.

Keywords: heart transplant, immunosuppression , calcineurin inhibitor, antimetabolite, proliferation signal inhibitor

Lecture Code : HW01-S3
Session Name : Heart Workshop
Session Topic : Perioperative Donor Management
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 6F-2

Assessment of Recipient Immunologic Status

Sang Eun Lee
Asan Medical Center, Republic of Korea

Heart transplantation remains the definitive treatment for end-stage heart failure, offering extended survival and improved quality of life. However, long-term graft survival depends significantly on the recipient's immunologic status and immune response management. Assessing immunologic status is crucial for predicting rejection risk, tailoring immunosuppressive therapy, and improving transplant outcomes. This presentation explores the methods used to evaluate immunologic profiles in heart transplant recipients, including pre-transplant risk stratification, HLA compatibility, and novel biomarkers that monitor immune activation and tolerance. Additionally, it discusses recent advancements in cellular and molecular techniques that enable more precise and personalized assessments of immune function. This approach enhances the understanding of individual rejection risks and the development of optimized, patient-specific therapeutic strategies, aiming to maximize graft longevity and patient quality of life.

Keywords: Heart Transplantation, Immunologic Status, Rejection Risk, HLA Compatibility, Personalized Immunosuppression

Lecture Code : LW01-S2
Session Name : J-K Joint Lung Workshop (Surgical Video Case Session)
Session Topic : Jumping to Operating Room
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-3

Japanese Case 1

Takeshi Shiraishi
Center of Organ Transplant Medicine (Lung Transplant Unit), Fukuoka University Hospital, Japan

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Unilateral lung transplantation was selected more often in Japan to maximize the number of transplants by sharing scarce donor resource. Indeed, almost half of brain-dead donor lung transplant (BDDLT) was performed as unilateral based on the national registry report of Japan (2018). Patients after unilateral lung transplantation require special attention for post-transplant care because 1) lung allograft volume is relatively small which resulting in poor exercise tolerance, 2) remaining contra-lateral lung is usually at risk of infection or de-novo malignancy, and 3) difference of pulmonary compliance of the right and left lung may cause thoracic deformity especially in pediatric cases. Fukuoka program was established in 2005, and a total of 91 lung transplants were performed until today. The most common primary disease of recipients was idiopathic interstitial pneumonias (38%) and other interstitial lung diseases (21.5%). Other indications are followed by lymphangioleiomyomatosis (12.7%), and chronic obstructive lung disease (8.9%), those are potential candidates for unilateral lung transplant unless if infectious or pulmonary hypertensive background are evident. Transplantation was performed as 84 BDDLT or 7 living-donor lung transplantation. Among those cases, 57 (62%) transplants were performed as unilateral. Long-term survival rates (5 year) of unilateral and bilateral transplants were 52 and 68 %, respectively, however, no significant difference was found between the procedures. Off course current standard procedure is bilateral sequential transplant however, unilateral transplant is still a useful and inevitable option especially where brain dead donor source is scarce like Japan. I will discuss about our results especially focusing on unilateral transplantation and present some unique experience after unilateral lung transplant. Case presentation will be included 1) Scoliosis with allograft compression after pediatric unilateral lung transplantation, 2) Treatment for invasive aspergillosis in contra-lateral lung after single lung transplantation.

Keywords: Lung transplantation, Unilateral, Pediatric, Scoliosis

スライド 1.JPG

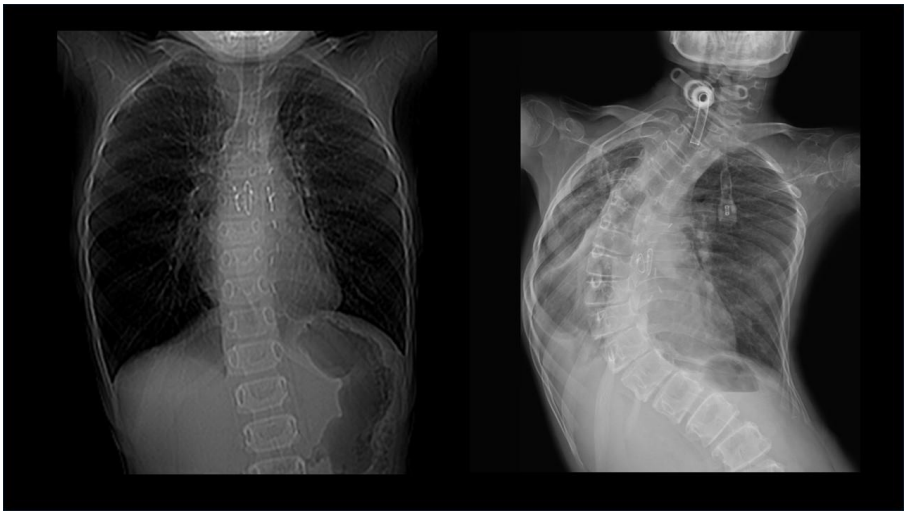
Lecture Code : LW01-S3
Session Name : J-K Joint Lung Workshop (Surgical Video Case Session)
Session Topic : Jumping to Operating Room
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-3

Korean Case 2

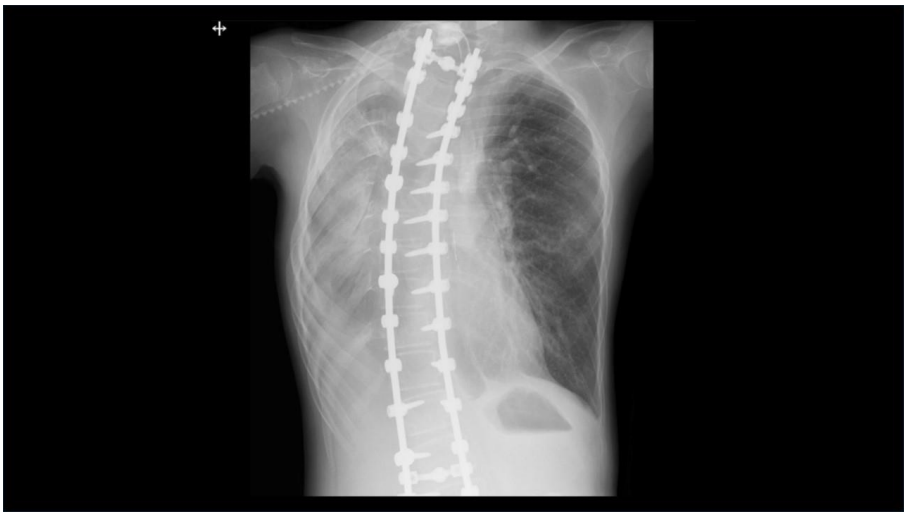
GEUNDONG LEE
Asan Medical Center, Republic of Korea

Title: Lung Re-Transplantation in a Patient with Chronic Rejection: Conversion from VV to VA ECMO Using Avalon® Cannula Abstract: The patient is a 22-year-old female with a history of primary pulmonary hypertension (PPH) who received a lung transplant on June 14, 2017. After developing chronic rejection and using bilevel positive airway pressure (BiPAP), she was considered for another lung transplant. On April 18, 2024, she presented to the emergency room (ER) with severe respiratory distress, requiring intubation and mechanical ventilation (MV). Veno-venous extracorporeal membrane oxygenation (VV ECMO) was initiated on April 22, 2024, with an Avalon cannula inserted into the right internal jugular vein. Awakening ECMO was implemented, and the patient was extubated the next day with high-flow nasal cannula (HFNC) support. While on VV ECMO preoperatively, the patient underwent lung re-transplantation on May 22, 2024, during which VV ECMO was converted to central veno-arterial extracorporeal membrane oxygenation (VA ECMO) using the Avalon cannula for venous drainage. ECMO was weaned during surgery, and the patient was discharged on August 7, 2024. In addition to discussing the successful use of the Avalon cannula for venous drainage in VA ECMO during lung re-transplantation, I will share Asan Medical Center's routine lung transplantation techniques, aiming to gather feedback and suggestions for improving procedures.

Keywords: Lung , Re-transplantation, ECMO, Avalon® Cannula



スライド 1.JPG



Lecture Code : LW01-S4
Session Name : J-K Joint Lung Workshop (Surgical Video Case Session)
Session Topic : Jumping to Operating Room
Date & Time, Place : November 16 (Sat) / 09:00-10:30 / Room 5F-3

Japanese Case 2

Takashi Kanou
Osaka University, Japan

Title: Surgical Techniques in Bilateral Lung Transplantation for Pulmonary Arterial Hypertension and Interstitial Lung Disease: A Japanese Experience Abstract: Lung transplantation is a life-saving procedure for patients with end-stage pulmonary diseases, yet it presents significant surgical challenges, particularly in complex cases. This presentation will discuss the surgical management of two distinct cases of bilateral lung transplantation performed at our institution in Japan. The first case involves a 19-year-old female with pulmonary arterial hypertension (PAH), and the second case concerns a 56-year-old male with advanced interstitial lung disease (ILD). In the case of the 19-year-old patient, severe right ventricular dysfunction and elevated pulmonary vascular resistance posed substantial intraoperative challenges. We utilized advanced extracorporeal membrane oxygenation (ECMO) techniques to manage these issues effectively. The surgical approach was tailored to address the unique anatomical and physiological challenges presented by IPH. The second case, involving the 56-year-old male, required the resection of the donor's left lower lobe prior to transplantation due to severe pneumonia and size mismatch. These factors necessitated careful pre-transplant surgical intervention to facilitate the successful implantation of the donor lung. The management of pneumonia was particularly important in preventing postoperative complications, and addressing the size mismatch was crucial for ensuring proper lung function post-transplantation. Meticulous surgical planning and the application of lung preservation techniques were pivotal in ensuring a favorable outcome. Both cases underscore the critical importance of individualized surgical strategies and the role of a multidisciplinary team in overcoming the complexities associated with lung transplantation. This presentation will feature detailed surgical video footage, illustrating the key technical steps and intraoperative decision-making that led to the outcomes in these challenging cases.

Keywords: lung transplant, pulmonary arterial hypertension, interstitial lung disease, size matching, ECMO

Lecture Code : JS02-S1
Session Name : KST-ESOT Joint Symposium
Session Topic : Current Trends and Challenges in DCD Organ Transplantation: A Comparative Analysis of Europe and Korea
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 3F-1

Current Status of DCD Organ Transplantation in Europe: Laws and Policies

Chloe Balleste
Donation & Transplantation Institute, Spain

The lecture titled **"Current Status of DCD Organ Transplantation in Europe: Laws and Policies,"** delivered by Dr. Chloë Ballesté Delpierre, provides a comprehensive overview of the current state of donation after circulatory death (DCD) in Europe, exploring legal frameworks, ethical guidelines, procedural elements, and medical advancements. Dr. Ballesté is an expert in donation and transplantation, serving as an associate professor at the University of Barcelona and as the Medical Director of the DTI Foundation.

Overview of DCD Organ Transplantation:
DCD refers to the process of organ donation that takes place after the cessation of circulatory functions, i.e., once the heart has stopped beating and cannot be restarted. The lecture categorizes DCD into two types based on the Maastricht classification system:
1. Controlled DCD (category III): This involves donors whose death is anticipated after the withdrawal of life-sustaining therapy (WLST). Typically, these are patients in intensive care units (ICUs), where withdrawal is planned, and organ perfusion takes place after death is confirmed.
2. Uncontrolled DCD (categories I and II): This occurs when a patient suffers sudden, unexpected cardiac arrest, often outside the hospital or in the emergency department, where resuscitation efforts fail. DCD practices have been on the rise globally, with considerable differences in legal and procedural frameworks across countries. The presentation includes data from 2023, highlighting significant variation in the number of DCD donors per million population (PMP) in different regions, with Spain, Belgium, and the USA leading the numbers. Spain, for instance, had the highest DCD donor rates with over 22 donors PMP, reflecting its advanced system and national commitment to organ donation.

Ethical and Legal Frameworks:

Dr. Ballesté emphasizes the ethical complexity inherent in DCD organ transplantation. The process must adhere to the Dead Donor Rule, a key principle that ensures organs are not removed until death has been confirmed. Ethical guidelines further necessitate a clear separation between the medical team responsible for patient care and the team responsible for managing organ donation. This separation is critical to avoid any potential conflicts of interest, ensuring that patient care is always prioritized, and decisions related to WLST are made independently of the donation process.

Moreover, the role of family consent in DCD procedures is crucial. In controlled DCD, discussions with the patient's family about organ donation should only begin once the decision to withdraw life-sustaining therapy has been made. This avoids the impression that donation is influencing end-of-life care decisions. The ICU team typically informs the family about the WLST process, and the transplant coordinator later addresses organ donation possibilities. Family consent is obtained only after the family is fully informed about the procedure and potential outcomes, including the possibility of delayed asystole (prolonged time before the heart stops), which could preclude donation.

Controlled DCD Procedure:

The DCD process begins with the withdrawal of life-sustaining therapies in a controlled hospital setting, typically within the ICU. Once life support is withdrawn, the patient's blood pressure drops, leading to functional warm ischemia, which starts when systolic blood pressure falls below 60 mmHg. This period is critical as it directly affects the viability of organs, and each organ tolerates ischemia differently. For example, kidneys may withstand longer ischemia times compared to hearts or lungs. Organ perfusion, either through cold perfusion or normothermic regional perfusion (NRP), must occur swiftly to preserve organ function.

Premortem measures, such as administering anticoagulants like heparin or inserting femoral cannulas, are sometimes conducted before WLST to improve the chances of successful donation. However, these interventions vary by country due to different legal and ethical frameworks. In some nations, premortem measures are prohibited or only allowed postmortem, as these actions require informed consent from the family, adding complexity to the process.

Uncontrolled DCD Procedure:

In contrast, uncontrolled DCD typically involves situations where a patient experiences cardiac arrest outside the hospital. If resuscitation attempts fail and the patient cannot be revived, the organ recovery process begins. However, in this case, prolonged ischemia poses a significant challenge. Asystole must be maintained for at least 20 minutes after failed resuscitation efforts before the patient can be considered for donation. Due to the unpredictability and time-sensitive nature of uncontrolled DCD, organ retrieval often has more limited success compared to controlled DCD.

Training and Education in DCD:

The lecture emphasized the importance of training and education in promoting DCD organ transplantation. Dr. Ballesté highlightes international workshops and congresses aimed at disseminating best practices, such as the European Society for Organ Transplantation (ESOT) Congresses and various DCD workshops held across the globe by DTI, including Spain, Lebanon, the UK, and Lithuania. These workshops focus on

training healthcare professionals in advanced DCD procedures and protocols, ensuring they are equipped to handle the emotional, ethical, and technical aspects of organ donation.
Moreover, the establishment of national protocols for DCD is crucial for its successful implementation. These protocols provide a consistent framework for healthcare providers to follow, ensuring patient care remains the priority while maintaining the potential for organ donation. This alignment is key to reducing variability in practices between hospitals and countries.

International Comparisons and Trends:
Dr. Ballesté presents data showcasing global trends in DCD organ donation, comparing countries based on their deceased donor rates per million population (PMP). Spain remains a leader in organ donation, reflecting its well-established systems and commitment to promoting both DCD and donation after brain death (DBD). In contrast, some countries are still developing their DCD programs, with variations in legal acceptance and medical protocols impacting their donor rates. For instance, countries like Belgium and the United Kingdom have similarly advanced DCD systems, whereas others, such as some Eastern European nations, are in the earlier stages of implementing DCD programs.
The presentation also touches on challenges such as prolonged ischemia times and legal restrictions in certain regions, which can hinder the growth of DCD practices. As more countries adopt DCD protocols, the hope is to increase donor rates and improve transplant outcomes globally.

Conclusion:
In conclusion, DCD organ transplantation is a growing field, with significant advancements in Europe and globally. The lecture by Dr. Chloë Ballesté Delpierre highlightes the importance of ethical integrity, robust hospital protocols, and extensive training in the success of DCD practices. The role of DCD in end-of-life care continues to evolve, providing hope for increasing the availability of organs for transplantation while maintaining the highest standards of care and ethical responsibility. International collaboration, education, and the development of best practices are essential to ensuring that DCD can meet the growing demand for organ transplantation worldwide.

Lecture Code : JS02-S4
Session Name : KST-ESOT Joint Symposium
Session Topic : Current Trends and Challenges in DCD Organ Transplantation: A Comparative Analysis of Europe and Korea
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 3F-1

The Hurdles in the Application of Machine Perfusion in Korea (work in Progress from ATW)

Won-Bae Chang
Jeju National University Hospital, Republic of Korea

Background: Multiple studies have reported that hypothermic machine perfusion (HMP) shows better results in the preservation of the marginal donor than traditional static cold storage (SCS) methods. This study was performed to evaluate the effect of HMP by comparing short-term outcomes of patients who underwent deceased donor kidney transplantation using HMP and SCS. Methods: There are ten patients with DDKT from 3/1/2022 to 12/31/2023. The renal grafts of six patients were preserved by SCS methods, and four grafts of patients were preserved by the HMP method. The characteristics of donors, recipients, and transplant process were compared between SCS and HMP groups, respectively. Delayed graft function (DGF) rate, post-operative 6-month graft and patient survival, and estimated glomerular filtration rate (eGFR) were compared in these two groups. Results: The HLA mismatch of recipients was higher in the SCS group (5.17 ± 0.98) compared to the HMP group (3.25 ± 0.50) (p=0.007). There were no significant differences between the two groups in the donors' characteristics. The cold ischemia time (CIT) was significantly longer in the HMP group than in the SCS group (1095 vs 275 minutes, p=0.003). The DGF rate, 6-month graft survival, and patient survival were not statistically different. Additionally, short-term eGFR and serum creatinine levels did not show meaningful differences in these two groups. In the HMP group, the last renal resistance of all 4 patients at the end of HMP use were less than 0.4mmHg/mL/min, and the last flow rate were higher than 60 mL/min in all 4 patients. Conclusions: HMP can be applied to the deceased donor kidney grafts with prolonged CIT with favorable short-term results and the HMP parameters including the renal resistance and flow rate are probably able to be used for the prediction of post-transplantation graft outcomes.

Keywords: machine perfusion, kidney transplantation, deceased donor, renal resistance

Figures.jpg

Figure 1A

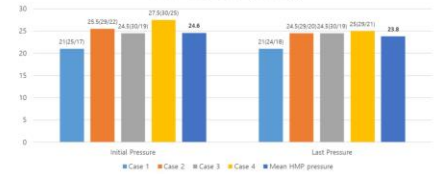


Figure 1A. Comparison between initial and last mean pressure of HMP group. It showed no statistical difference but showed a slight tendency to decrease (24.6 ± 2.72 mmHg of initial pressure and 23.8 ± 1.85 mmHg of last pressure, p=0.617). Mean pressure was calculated as (systolic pressure + 2 x diastolic pressure) / 3.

Figure 1B

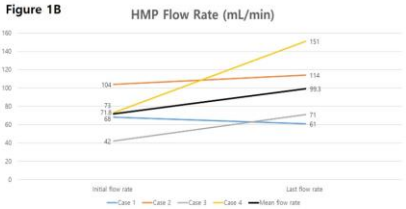


Figure 1B. Comparison between initial and last flow rate of HMP group. The black bold line showed no statistical difference but a tendency to increase (71.8 ± 25.4 mL/min of initial and 99.3 ± 41.5 mL/min of last flow rate, p=0.486).

Figure 1C

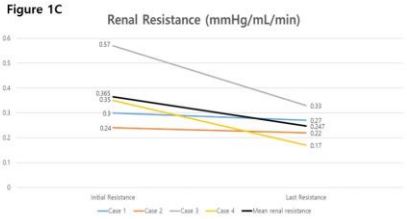


Figure 1C. Comparison between initial and last renal resistance of HMP group. The black bold line showed no statistical difference but a tendency to decrease (0.365 ± 0.144 mmHg/mL/min of initial and 0.247 ± 0.069 mmHg/mL/min of last renal resistance, p=0.200).

Figures.jpg

	SCS group N=6	HMP group N=4	P value
Recipients			
Age	52.8 ± 7.83	51.5 ± 6.86	0.789
Sex Male Female	 6 0	 4 0	1.000
Cause of ESRD	HTN, DM, GN, IgAN	HTN, DM	
Duration of pre-transplant dialysis	6.50 ± 3.89	3.75 ± 4.86	0.348
Underlying disease	HTN, DM, RCC,	HTN, DM, RCC, hypothyroidism, Stroke	
ABO type	3A, 2B, 1AB	1AB, 3B	
HLA mismatch	5.17 ± 0.98	3.25 ± 0.50	0.007*
PRA (%)	6.33 ± 15.5	12.0 ± 24.0	0.659
EPTS (%)	53.8 ± 28.0	42.0 ± 18.1	0.481
Donor			
Age	44.7 ± 11.6	42.3 ± 16.2	0.789
Sex Male Female	 3 3	 2 2	1.00
Underlying disease	CVA, hypoxic brain damage, MI	Pneumonia, CVA, hypoxic brain damage, Endocarditis	
ABO type	3A, 1B, 1O, 1AB	1AB, 3B	
CRRT	0.50 ± 0.548	0.50 ± 0.577	1.000
K- KDPI (%)	37.5 ± 12.7	52.0 ± 24.5	0.250
Transplants			
WIT (minute)	44.2 ± 8.75	47.0 ± 2.94	0.556
CIT (minute)	**275 ± 204**	**1095 ± 427**	**0.003**

Table 1. Characteristics of recipients, donors, and the transplant process in both groups. (ESRD, end stage renal disease; HLA, human leukocyte antigen; PRA, panel reactive antibody; EPTS, estimated post-transplant survival; CRRT, continuous renal replacement therapy; K-KDPI, Korean Kidney Donor Profile Index; WIT, warm ischemia time; CIT, cold ischemia time).

	SCS group N=6	HMP group N=4	P value
DGF rate	0.167 ± 0.40	0.500 ± 0.47	0.312
6-Mo eGFR (mL/min/1.73m²)	53.5 ± 27.1	46.2 ± 12.6	0.633
6-Mo serum creatinine (mg/mL)	1.63 ± 0.64	1.66 ± 0.44	0.950
6-Mo Graft survival rate	100%	100%	1.000
6-Mo Patient survival rate	100%	100%	1.000

Table 2. It shows the short-term outcomes of both groups. Short-term outcomes were evaluated post-operative 6-month DGF rate, eGFR, serum creatinine levels, graft and patient survival rate. (DFG, delayed graft function; eGFR, estimated glomerular filtration rate).

Lecture Code : JS03-S1
Session Name : ASTREG Joint Symposium
Session Topic : Current Status and Challenges of Pediatric Organ Transplantation in Asia
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-2

Current Status of Pediatric Kidney Transplantation in Japan

Seiichiro Shishido
Toho University, Faculty of Medicine, Japan

The healthy development of pediatric kidney transplantation requires transparent data disclosure. While Japan has a registry for adult kidney transplants, no such registry exists for pediatric patients. In 2005, the "Clinical Statistics Subcommittee for Pediatric Kidney Transplantation" was formed to collect and analyze pediatric transplant data. By 2018, 3,274 pediatric kidney transplants had been registered, with 80 to 100 transplants performed annually. Of these, 89% were living donor transplants, and 11% were from deceased donors. Among deceased donor transplants, 78.3% came from cardiac death donors, and 21.7% from brain death donors. Demographically, 60% of recipients are male, with most aged 10 years or older, though transplants for younger children have increased. CAKUT is the most common underlying disease, followed by FSGS. Preemptive transplants have risen, with 32.1% of cases from 2002 to 2018 being preemptive. Advances in immunosuppressive drugs have significantly improved outcomes. The 5-, 10-, and 15-year survival rates for living donor transplants in the 2002–2018 cohort were 99.2%, 98.5%, and 97.1%, respectively. Deceased donor transplants had survival rates of 98.6%, 97.6%, and 97.6%. Graft survival rates have also improved. For living donor transplants in the 2002–2018 cohort, the 5-, 10-, and 15-year graft survival rates were 96.3%, 89.7%, and 77.4%. For deceased donor transplants, the rates were 82.4%, 61.1%, and 46.5%. Chronic rejection remains the leading cause of graft failure. Key developments include an increase in preemptive transplants and a growing number of transplants for younger children. ABO-incompatible transplants have become more common, demonstrating comparable outcomes to ABO-compatible transplants. A revised allocation policy in 2018, which prioritizes pediatric recipients, has led to a rise in pediatric deceased donor transplants, with more than 40 cases in 2023. Overall, registries play a critical role in tracking outcomes, improving treatment methods, and guiding pediatric kidney transplantation practices.

Keywords: Registry, pediatric, kidney transplantation, ABO incompatible

Lecture Code : JS03-S2
Session Name : ASTREG Joint Symposium
Session Topic : Current Status and Challenges of Pediatric Organ Transplantation in Asia
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-2

Improving Access to Kidney Transplantation in Children from Low Resource Countries in Asia and Pediatric Transplant Registry of Singapore

Hui Kim Yap
National University of Singapore, Singapore

Kidney transplantation is the optimal form of kidney replacement therapy for children as it leads to superior growth, improved neurocognitive development and academic performance and better quality of life and rehabilitation. The obstacles to developing a successful pediatric transplant program in low resource areas include poor health care funding for childhood diseases, lack of governmental support, lack of trained pediatric nephrologists and transplant team and poor laboratory facilities. The prerequisites to developing a pediatric kidney transplant program in low resource areas include presence of adult transplant surgical experience, availability of laboratory services for at least direct cross-matching, renal function tests and drug level monitoring, trained pediatric nephrology and transplant team, funding avenues either governmental or charity, availability of cheaper generic drugs and awareness of the impact of public health, in particular endemic infections, on transplant outcomes. Finally, to ensure sustainability, the developing program should focus on transplants with a low risk of rejection, as many programs only have basic laboratory tests available and will not have the resources to deal with the highly sensitized patient. Adequate transplant protocols should be in place adapted to the health care practices and facilities of the developing center. Infection control is important, with emphasis on public health measures including completion of childhood immunization schedules, and appropriate antimicrobial prophylaxis post-transplant. As diarrheal diseases are a common problem resulting in acute kidney injury, it is important to ensure good water supply and food hygiene, as well as to institute protocols in district hospitals to ensure adequate hydration and appropriate antibiotic treatment for bacterial gastroenteritis prior to transfer to the transplant center. Development of patient education materials and advocacy with governmental organizations are also crucial for ensuring sustainability of the transplant program. In conclusion, pediatric kidney transplantation in low resource countries can be a reality.

Keywords: paediatric kidney transplant , prerequisites, sustainability, low resource countries

Lecture Code : JS03-S3
Session Name : ASTREG Joint Symposium
Session Topic : Current Status and Challenges of Pediatric Organ Transplantation in Asia
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-2

Special Situations in Pediatric Liver Transplants

Gomathy Narasimhan
Dr.Rela Institute and Medical Centre, India

Biliary atresia is the most common etiology for which pediatric liver transplantation is offered and it constitutes close to 50% of the transplants performed. In our discussion on special situations in pediatric liver transplantation, let us focus on the other indications for liver transplant in children, especially metabolic liver disease. Metabolic liver disease as an indication for transplant is seen in 15-18% children. The type of metabolic disease can be broadly divided into three categories – 1. Disorders with enzymes defect only in the liver and results in cirrhosis and hence need a transplantation, 2. Disorders with enzyme defect restricted to the liver but no cirrhosis 3.Disorders with enzyme defect in the liver and extrahepatic tissues and transplant partially corrects the enzyme defect and limits the consequences. Patients with Categories 2 and 3 have a liver that can be considered as a graft option for another patient, understanding the limitations of such an approach. Transplantation for metabolic disease offers the opportunity to innovate on graft options. Domino transplant is when the recipient (1) becomes a donor and the liver removed from the recipient (1) is utilized in another recipient (2) (Eg: MSUD). Auxiliary Partial Orthotopic transplant is when a portion of the donor liver is transplanted, retaining a portion of the native liver (Eg:CNS) The transplanted liver will help provide the deficiency in metabolic disease at the same time allowing for possibility of gene therapy in future . Option of having two portions of liver with different defective enzyme and mutually nullifying the deficiency by supplementing the defective deficiency in the other portion can eliminate the need for a donor liver. Such innovations are possible only when there is a large patient pool with metabolic disease. Alternately, Registry data for metabolic disease will help better utilization of livers from children with metabolic disease and may help with expanding the donor pool significantly.

Keywords: Metabolic Liver Disease, Domino Transplant, Auxiliary Partial Orthotopic Liver Transplant, Expansion of donor pool, Metabolic Disease Registry

Lecture Code : JS03-S4
Session Name : ASTREG Joint Symposium
Session Topic : Current Status and Challenges of Pediatric Organ Transplantation in Asia
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-2

Current Status of the Pediatric Transplantation in Philippine

Ma Lorna Lourdes Simangan
National Kidney and Transplant Institute, Philippines, Philippines

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Current Status of Pediatric Transplantation in the Philippines Since the foundation of the National Kidney and Transplant Institute (NKTI) in 1981, the Philippines has been a proponent of Pediatric Organ Transplantation. The first pediatric living donor liver transplant was performed in April 1996 and the first pediatric kidney transplant was in January 1988. At present based on the 2023 International Registry in Organ Donation and Transplantation (IRODaT) report, the worldwide living organ donation rate in the Philippines is at 4.95 patients per million population (ppm) and the deceased organ donation rate is at 0.13ppm. From this data, review of the status of the pediatric organ transplantation was conducted. It has been shown that several measures are being implemented to address the challenge on organ supply and demand. To date, the Department of Health in the Philippines has accredited 44 transplant facilities nationwide and according to the available data, The Medical City hospital already did 15 pediatric liver transplants since 2011, St. Luke's Medical Center did 16 pediatric kidney transplants since 2004 and the NKTI had a total of 175 pediatric kidney transplants. The Philippine Health Insurance Corporation, tasked to deliver universal health insurance coverage for the Filipinos, provides benefit package for organ transplantation. Fellowship programs to train transplant specialists are being offered to ensure availability of this expertise. The Philippine Board for Organ Donation and Transplantation (PBODT) with the Human Organ Preservation Effort (HOPE) and the Philippine Network for Organ Sharing (PhilNOS) are in coordination with various medical institutions, specialty societies and other government and private agencies to widen the reach and support for pediatric organ transplantation. There is a need for stronger collaboration and standardization in the healthcare system and work towards cultural and structural changes in the country.

Keywords: Philippine Experience, Current Trends, Kidney and Liver Transplantation, Ongoing Challenges, Future Directions

Lecture Code : CC13-S1
Session Name : Concurrent Symposium 13 (Heart)
Session Topic : MCS Therapy in Severe Heart Failure Patients
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 6F-2

ECMO Cannulation Strategies for Left Ventricular Unloading During VA-ECMO Support

Min-Seok Kim
Asan Medical Center, Republic of Korea

In VA-ECMO patients, LV unloading prevents LV dilation and damage from backflow. Partial drainage methods like pulmonary artery or retrograde aortic cannulation are less effective, making transseptal left atrial cannulation connected to the venous circuit a potentially beneficial option for more complete LV unloading in patients with significant LV dysfunction. However, recent randomized controlled trials, including our EVOLVE-ECMO trial, show that early systemic LV unloading with this method offers no additional benefit. In addition, central-type VA-ECMO, in which outflow from the pump directly returns to the ascending aorta, allows antegrade perfusion to end-organs with reduced LV loading. However, central-type VA-ECMO also has some disadvantages, such as a high bleeding risk and requirement for sternotomy to insert or remove the cannulas. In this lecture, I will introduce our recent analysis about the comparison of VA-ECMO configurations for patients listed for heart transplantation. We suggest that if patients are being stably supported with their initial ECMO configuration, whether it is central or peripheral, it should be maintained, and ECMO conversion should only be cautiously performed when necessary.

Keywords: VA-ECMO, LV unloading, Central ECMO, Peripheral ECMO, Cannulation

Lecture Code : CC14-S1
Session Name : Concurrent Symposium 14 (Lung)
Session Topic : J-K Joint Symposium 1: Nearby but Different Lung Transplant
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-3

Establishment Lung Transplant Team in Japan (History, Team Building, Donor Approach)

Masaaki Sato
The University of Tokyo, Japan

A quarter-century has passed since the inception of clinical lung transplantation in Japan. The increase in brain-dead donors has brought several issues to be addressed for the further development of the field in Japan. First, major transplant centers, especially those performing multi-organ transplants, are facing a shortage of resources. This issue arises because the current system was not designed to handle organ transplants efficiently, and such practices are treated as a "niche" within standard medical operations. Second, while lung transplantation outcomes in Japan have been favorable compared to international standards, this means that new centers are expected to achieve high standards from the very beginning. Additionally, an increase in the number of cases puts pressure on established centers to maintain their quality of patient care. Third, the number of living-donor lung transplants is decreasing. Although this trend is positive overall, the advanced techniques developed through living-donor transplants have significantly contributed to the high quality of lung transplantation in Japan. In summary, a new system to prioritize organ transplantation is needed in Japan, and the initiative should be taken by the government. This should include increased support (e.g., higher medical fees) for transplant centers, assistance for new centers from established ones, greater involvement of physicians (e.g., respirologists), and an improved training system for the next-generation professionals., and efforts to expand the donor pool must continue. Addressing these issues will enhance the effectiveness of lung and organ transplantation in Japan.

Keywords: Lung transplantation, resource, sustainability, system development, physician

Keywords: Lung transplantation, resource, sustainability, system development, physician

Lecture Code : CC14-S2
Session Name : Concurrent Symposium 14 (Lung)
Session Topic : J-K Joint Symposium 1: Nearby but Different Lung Transplant
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-3

A Way to Setup Lung Transplant Team in Korea

Song Yee Kim
Yonsei University College of Medicine, Republic of Korea

The journey of lung transplantation in Korea began in 1996 at Youngdong Severance Hospital, part of Yonsei University Health System. Initially, the program was primarily led by thoracic surgeons. However, we realized that effective management of transplant patients requires not only surgical expertise but also comprehensive care covering pre-operative, intra-operative, and post-operative phases, as well as waiting list patient management and post-transplant complication management. We have struggled with building a multidisciplinary team for lung transplants. Now, our team includes thoracic surgeons, pulmonologists, intensivists, anesthesiologists, infectious disease specialists, coordinators, and specialized nurses as core members. Additionally, other specialists from cardiology, rehabilitation medicine, hematology, and various fields contribute significantly to the care of transplant patients. This lecture will introduce the journey of establishing this multidisciplinary team, highlighting the collaborative approach and the essential roles each specialty plays in enhancing transplant outcomes.

Keywords: Lung transplantation team, multidisciplinary team , Korea, ., .

Lecture Code : CC14-S3
Session Name : Concurrent Symposium 14 (Lung)
Session Topic : J-K Joint Symposium 1: Nearby but Different Lung Transplant
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-3

Perioperative Management in Japan

Yui Watanabe
Tohoku University, Japan

Japan has fewer deceased donors compared to Korea. Consequently, single lung transplantation (SLTx) remains crucial in Japan for optimizing organ sharing. Additionally, living lung lobar transplantation (LLLTx) represents a vital option for smaller recipients who face the risk of waitlist mortality. Traditionally, the lung with lower blood flow was selected for SLTx. However, advancements in perioperative management have allowed for the transplantation of lungs with higher blood flow under certain recipient conditions. We conducted a retrospective review of pre-transplant lung perfusion scintigraphy in recipients of deceased donor SLTx. Patients were categorized into three groups based on the blood flow ratio of the transplanted lung: even (30-70%), subordinate (<30%), and dominant (>70%). Out of 84 patients analyzed, 65 were in the even group, 11 had transplants on the subordinate side, and eight on the dominant side. Our findings demonstrate that successful SLTx is feasible even when the graft is placed on the side with dominant blood flow, suggesting that the choice of transplant side can be more flexible. Furthermore, we recount a recent LLLTx case at our center. The patient, a 39-year-old woman with interstitial pneumonia, was unlikely to survive the waiting period at the time she was referred to us. She was slated for an ABO-incompatible LLLTx. However, due to rapidly deteriorating respiratory function, veno-venous extracorporeal membrane oxygenation (VV ECMO) was employed as a bridge to LLLTx. Desensitization for ABO incompatibility was performed under VV ECMO with careful infection control. This case highlights crucial aspects of our perioperative management and the challenges faced during such urgent procedures.

Keywords: single lung transplantation, living lung lobar transplantation, ABO-incompatible transplantation, extracorporeal membrane oxygenation, perioperative management

Keywords: single lung transplantation, living lung lobar transplantation, ABO-incompatible transplantation, extracorporeal membrane oxygenation, perioperative management

Lecture Code : CC14-S4
Session Name : Concurrent Symposium 14 (Lung)
Session Topic : J-K Joint Symposium 1: Nearby but Different Lung Transplant
Date & Time, Place : November 16 (Sat) / 11:00-12:30 / Room 5F-3

Korean Experience of Highly Urgent Lung Transplant

Jimyung Park
Seoul National University Hospital, Republic of Korea

In South Korea, the lung allocation system is primarly based on the severity of the patient's condition. Specifically, patients requiring mechanical ventilation (MV) or extracorporeal membrane oxygenation (ECMO) are given priority for lung transplantatioon. Consequently, compared to Western countries, a higher proportion of patients in South Korean lung transplant centers are bridged to lung transplantation using MV or ECMO support. The most common indication for urgent bridging to lung transplantation is an acute exacerbation of pre-existing interstitial lung disease (ILD). In these cases, most patients have already been evaluated by the transplant team and placed on the waiting list. However, in rare instances, such as rapidly progressing ILD, including MDA5 dermatomyositis associated ILD, patients may require urgent evaluation to assess their candidacy for lung transplantation and undergo immediate bridging procedure. Furthermore, while severe COVID-19 pneumonia has become less common recently owing to effective vaccination and reduced virulence of newer virus variants, during the early pandemic, soome patients with COVID-19 ARDS also underwent urgent bridging to lung transplantation. Historically, outcomes for patients bridged to lung transplantation with support of MV or ECMO were considered poor compared to non-bridged cases. However, advancements in ECMO technology and increased expertise among transplant team, including skilled intensivisits, have significantly improved outcomes. Currently, post-transplant results for patients urgently bridged with MV or ECMO are comparable to those for non-bridged lung transplant recipients. In this session, we will review South Korean data on urgent bridging to lung transplantation.

Keywords: Lung transplantation, Urgency, Bridging, Mechanical ventilation, ECMO

Lecture Code : KL02-S1
Session Name : Keynote Lecture 2
Session Topic : -
Date & Time, Place : November 16 (Sat) / 15:00-15:30 / Room 3F-1

Porcine Liver Xenotransplantation - Bridge for Life Saving?

Hidetaka Hara
The Second Affiliated Hospital, Hainan Medical University, China

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For patients with end-stage liver disease, life-saving alternatives are limited, making transplantation the primary treatment option. Pig liver xenotransplantation has emerged as a promising solution to address the critical shortage of donor organs. Significant progress in xenotransplantation has been achieved through advances in genetically engineered pigs and novel immunosuppressive treatments. These developments have led to improved outcomes in pig heart and kidney xenotransplantation in nonhuman primates, paving the way for initial clinical trials. However, pig liver xenotransplantation continues to face unique challenges, such as antibody-mediated rejection, coagulation incompatibilities, thrombocytopenia, and persistent inflammation, all of which hinder long-term survival and require further research. This keynote will summarize the extensive experimental and clinical experiences with liver xenotransplantation, including the transition from primate to pig donors driven by ethical and zoonotic considerations. It will also explore the potential role of pig liver xenografts in managing hepatic failure, both as a bridge to allotransplantation and as auxiliary support following it. Emerging strategies, including genetic modifications and pharmacological interventions, will be discussed in relation to these applications. Finally, recent cases of pig liver xenotransplantation in China involving both decedents and a living patient will be discussed, highlighting the expanding clinical applications of pig liver xenografts and the groundwork they lay for future clinical trials.

Keywords: Clinical application, Decedent models, Genetically engineered pigs, Liver transplantation, Xenotransplantation

Lecture Code : CC15-S1
Session Name : Concurrent Symposium 15 (Liver)
Session Topic : Management of Perioperative Non-surgical Complications
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 3F-1

Neurologic Complications- HEP, Seizure Before and After LT

Hyo Jae Kim
Asan Medical Center, Republic of Korea

The intricate relationship between the liver and the brain is far more profound than commonly perceived. This complex interplay becomes particularly evident in the context of liver dysfunction and transplantation, where a spectrum of neurological complications can arise, significantly impacting patient outcomes and quality of life. Liver dysfunction is a primary trigger for hepatic encephalopathy (HE), a serious neuropsychiatric syndrome characterized by diverse neurological manifestations. These include alterations in consciousness, cognitive impairment, motor dysfunction, and notably, seizures. Furthermore, the process of liver transplantation itself, coupled with the necessary immunosuppressive regimens, introduces additional risk factors for neurological complications. Patients with pre-existing liver dysfunction undergoing transplantation face an elevated risk of developing these neurological complications, necessitating vigilant clinical management and tailored therapeutic approaches. This presentation aims to elucidate the underlying pathophysiology of hepatic encephalopathy and neurological abnormalities in liver transplant recipients, with a particular emphasis on seizures. In addition, we will discuss practical approaches to diagnosis, risk factors, and preventive strategies. We will cover treatment modalities, including pharmacological interventions and management of metabolic derangements to manage HE and seizures. By bridging Surgery, Hepatology and Neurology, we hope to promote a more integrated approach to patient care, ultimately improving outcomes and quality of life for individuals affected by liver dysfunction and those undergoing liver transplantation.

Keywords: Hepatic encephalopathy, Liver transplantation, Neurological complication, Seizure

Lecture Code : CC15-S3
Session Name : Concurrent Symposium 15 (Liver)
Session Topic : Management of Perioperative Non-surgical Complications
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 3F-1

Significance of Sarcopenia and Perioperative Exercise/Nutritional Therapy in Liver Transplantation

Toshimi Kaido
St. Luke's International Hospital, Japan

Patients undergoing liver transplantation (LT) are often associated with sarcopenia. In this lecture, we would like to introduce the significance of sarcopenia in patients undergoing LT, perioperative exercise/nutritional therapy, and our new criteria for LT considering pre-transplant body compositions. First, we prospectively measured skeletal muscle mass (SMM) and handgrip strength (HGS) in 72 adult patients who underwent living donor LT (LDLT). Sarcopenia was defined as low SMM and low HGS. The overall survival (OS) rates were significantly lower in patients with sarcopenia than those without sarcopenia ($p < 0.001$). Perioperative nutritional therapy significantly increased OS rates in patients with low SMM. Moreover, patients who received preoperative exercise/nutritional therapy had significant increase in muscle strength and physical activity. Next, we focused on body compositions. We evaluated pre-transplant skeletal muscle mass, muscle quality, and visceral adiposity by measuring skeletal muscle mass index (SMI), intramuscular adipose tissue content (IMAC), and visceral-to-subcutaneous adipose tissue area ratio (VSR) respectively for 277 consecutive patients who underwent adult LDLT between January 2008 and July 2016. OS rates of patients with low SMI, high IMAC, and high VSR (abnormal factors) were significantly lower than those with high SMI, low IMAC, and low VSR, respectively. On multivariate analysis, these factors were identified as independent risk factors for mortality after LDLT. One-year OS rate of patients with no abnormal factor, each one factor, two factors, three factors were 98%, 78%, 60%, and 41%, respectively. Based on these findings, we have established new selection criteria for LDLT: 1) to exclude patients with three abnormal factors (recommend deceased donor LT), 2) to perform perioperative exercise/nutritional therapy. As a result, one-year OS rate after LDLT has dramatically increased to 99%. In conclusion, new selection criteria for LDLT considering pre-transplant body compositions with perioperative exercise/nutritional therapy achieved excellent outcomes.

Keywords: Sarcopenia, exercise/nutritional therapy, Body compositions, Innovation

Lecture Code : CC15-S4
Session Name : Concurrent Symposium 15 (Liver)
Session Topic : Management of Perioperative Non-surgical Complications
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 3F-1

Delirium and Insomnia Problem

Hye Yoon Park
Seoul National University Hospital, Republic of Korea

Delirium and insomnia are common neuropsychiatric complications following liver transplantation, significantly impacting patient recovery and quality of life. Delirium, a serious neuropsychiatric syndrome, occurs in approximately 19-25% of liver transplant recipients. It presents acute confusion, cognitive dysfunction, and circadian rhythm disruption, often accompanied by behavioral disturbances and hallucinations, particularly in its hyperactive type. Common risk factors include high the Model for End-Stage Liver Disease (MELD) scores, alcohol-related liver disease, hepatic encephalopathy, and pre-transplant infection. The etiology of post-transplant delirium is multifactorial, encompassing metabolic disturbances, medications (such as immunosuppressants and opioids), surgical stress, bleeding, and postoperative complications. Insomnia is another frequent challenge, even prior to liver transplantation, affecting 60% of transplant candidates. Up to two-thirds of recipients experience sleep disturbances within a year post-surgery. Insomnia can significantly contribute to the development of other mental health issues, including anxiety, depression, and cognitive impairment. It is often associated with physiological changes induced by immunosuppressants or systemic inflammation, as well as environmental factors such as intensive care unit stays. Additionally, these complications are closely interlinked: sleep deprivation can exacerbate cognitive impairment and precipitate delirium, with insomnia often serving as an early manifestation of delirium onset. Early detection of delirium is crucial, allowing for prompt management of underlying triggers such as metabolic imbalances and adverse medication effects. Non-pharmacological interventions, including the promotion of consistent sleep-wake cycles and minimization of environmental stressors, play a key role in management. Managing insomnia necessitates both behavioral and pharmacological strategies. Cognitive behavioral therapy for insomnia (CBT-I) is a well-established and effective intervention for improving sleep quality. When pharmacological treatment is required, careful consideration must be given to potential interactions with immunosuppressants. Furthermore, a preventive, multidisciplinary approach to managing delirium and insomnia should be systematically integrated at the hospital level. In conclusion, effectively addressing both cognitive and sleep disturbances is essential for improving post-transplant outcomes and enhancing quality of life in liver transplant patients. Further

research is needed to develop specific management guidelines and to better understand the long-term cognitive impacts of these conditions.

Keywords: Delirium, Insomnia, Liver transplantation, Cognition, Sleep

Lecture Code : CC16-S2
Session Name : Concurrent Symposium 16 (Kidney/Pancreas)
Session Topic : Donor Recipient Selection in Living Donor KT
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-1

Navigating Metabolic Risks in Living Kidney Donors: Outcomes and Follow-up for Optimal Health

Ho Sik Shin
Kosin University Gospel Hospital, Republic of Korea

This presentation explores the metabolic risks faced by living kidney donors, focusing on the importance of long-term outcomes and appropriate follow-up care. Post-donation, kidney donors are at increased risk of conditions such as hypertension, diabetes, and chronic kidney disease, which necessitates careful monitoring. Historically, to minimize risks, living kidney donors have been highly selected and healthy. Operative risks are well-defined, yet concern remains about long-term risks. Retrospective studies comEaring donors with matched general population controls have found no increased donor risk. Prospective studies comparing donors with controls (maximum follow-up, 9 years) have reported that donor GFR is stable or increases slightly, whereas GFR decreases in controls. However, these same studies identified metabolic and vascular donor abnormalities. There are a few retrospective studies comparing donors with controls. Each has limitations in selection of the control group, statistical analyses, and/or length of follow-up. One such study reported increased donor mortality; 2 reported a small increase in absolute risk of ESKD. Risk factors for donor ESKD are similar to those in the general population. Postdonation pregnancies are also associated with increased risk of hypertension and preeclampsia To ensure optimal health, early identification and management of metabolic risks are essential. Personalized monitoring strategies, along with lifestyle modifications, play a critical role in mitigating these risks. The review discusses the need for structured post-donation care, emphasizing continuous follow-up programs that address individual donor health needs and the potential long-term impact on metabolic health. This review underscores the importance of tailored follow-up care for living kidney donors to maintain optimal health. It also calls for further research on mitigating metabolic risks to ensure positive health outcomes in the long term, while advocating for improved post-donation care pathways.

Keywords: living kidney donor, metabolic risk, ESKD, Risk factor

Lecture Code : GTW01-S1
Session Name : GTW (Go Together With) Symposium
Session Topic : How to Improve Organ Transplantation in Kazhakstan
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 6F-1

Current Status & Government Structures of Organ Transplantation in Kazhakstan

Myltykbay Rysmakhanov
West-Kazakhstan Medical University, Kazakhstan

Current Status & Government Structures of Organ Transplantation in Kazhaksta

Keywords: Transplantation, organs, Kazakhstan, kidney, liver

Lecture Code : GTW01-S2
Session Name : GTW (Go Together With) Symposium
Session Topic : How to Improve Organ Transplantation in Kazhakstan
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 6F-1

Hurdles and Solutions in Organ Transplantation in Kazhakstan

Zhassulan Baimakhanov
Syzganov's National Scientific Center of Surgery, Kazakhstan

Liver transplantation has been performed in Kazakhstan since December 2011. The first living donor liver transplantation (LDLT) procedure was performed in Syzganov’s National Scientific Center of Surgery (Almaty). Kazakhstan is an area in which cadaveric grafts are not sufficient for several reasons, leaving LDLT as the only possible treatment for patients with end-stage liver disease. The first brain-dead organ donation occurred in 2013, and the number of organ donations has not increased since then. The Kazakh national procurement and allocation center was established at the same time. During the period from 2011 to 2024, a total of 2632 organ transplantations were performed in Kazakhstan, of which kidney transplantation was 1990 (75.6%) cases, liver transplantation was 525 (19.9%), heart transplantation was 97 (3.7%), lung transplantation was 18 (0.7%), pancreas 2 (0.1). At the time of writing, 4103 patients are on the national waiting list, with a total population of 20 million. In Kazakhstan, the transplant law established an opt-out system of organ donation. Despite the government calling for an increase in the number of organ donors, there is still some controversy among individuals and family members of potential donors, who currently argue for legislative change.. We hope that increased experience will lead to further improvements in the outcomes of patients undergoing liver transplantation and establishment of the organ donation system in Kazakhstan

Keywords: organ donation, liver transplantation, cadaveric donation, kazakhstan

Lecture Code : GTW01-S3
Session Name : GTW (Go Together With) Symposium
Session Topic : How to Improve Organ Transplantation in Kazhakstan
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 6F-1

How to Promote Organ Transplantation in Korea? History and Current Structures

Samuel Lee
KODA, Republic of Korea

The Organ Transplant Act of the Republic of Korea was enacted in 2000 and partially revised in 2010. The most important of the revised contents is that the representative of each medical institution is obligated to report potential brain-dead patients. KODA was established in 2009 and merged with the Korea Tissue Donation Support Center in 2017. KODA consists of three regional offices and one KODA LAB. KODA has signed a brain-dead management business agreement with 76 hospitals and currently has 32 HOPO institutions. The most important program for activating organ donation is the Donation Improvement Program (DIP). DIP is operated to reduce the most vulnerable and obstacles in the organ donation process. DIP is planned and operated based on the situation of each medical institution and data on potential brain-dead patients. It is mainly targeted at neurosurgeons, neurologists, emergency medicine doctors, and intensive care unit workers. The first step of DIP is a mutual agreement, the second step is to form a DIP committee, the third is to collect data on potential brain-dead donors from each medical institution, and the fourth is to create opportunities for donation performance through DIP committee meetings. There are 84 DIP agreement institutions in Korea, and 77.8% of brain-dead organ donors in 2023 occurred at DIP agreement institutions. In addition, it can be said that education on life sharing for donor families, medical staff, prospective medical professionals, and youth is very important as a way to activate organ donation. In Korea, the second week of September is designated as Life Sharing Week every year, and various public relations, campaigns, and life sharing concerts are held. Recently, it is also worth noting that public relations through SNS is playing a big role.

Keywords: promotion, improvement, donation, organ, transplantation

Lecture Code : GTW01-S5
Session Name : GTW (Go Together With) Symposium
Session Topic : How to Improve Organ Transplantation in Kazhakstan
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 6F-1

Introduction of Organ Transplant Registry and Its Activities

Curie Ahn
National Medical Center, Republic of Korea

The organ transplantation registry in Asia is not yet prepared for the challenges of AI. To begin, I'll provide an overview of "kidney transplantation activities" in Asia, using data from the GODT. The GODT data offers both regional and country-specific insights. The data collected between 2015 and 2022 shows that many Asian countries with low transplantation frequencies. In Asia, 38% of countries performed both LD and DDKT, 17% performed only LDKT, and 5% did not perform any kidney transplantation. It also highlights significant differences in KT activity rates among Asian countries, with only 8 countries exceeding the global average of 17.1 pmp. To enhance predictability, data collection often relies on hospital or national databases, such as the KOTRY database in South Korea. In KOTRY, the (KT) cohort includes approximately 1,200 cases per year, covering 60% of total cases. The liver transplantation (LT) cohort includes about 700 cases annually, covering 60% of total cases. Current KOTRY data shows that the 5-year survival rates are 96% for patients and 90.5% for grafts. KOTRY users are requesting automated data collection from EMR to reduce workload, improved data accuracy, integration of unstructured data, and real-time assistance. In response to these requests, we have developed an API (Application Program Interface) to directly transfer hospital EHR data into the KOTRY database. In summary, KT in Asia is marked by significant variation in medical capacity, especially for (DDKT), Younger recipient populations with preventable kidney diseases, and strong gender inequalities. Also, there is an urgent need for government-led national organ transplantation programs in many Asian countries. As discussed, AI will significantly impact transplantation medicine, aiding in predictive analytics, personalized care, operational efficiency, and research. However, the current databases in Asia are much insufficient to fully realize this potential. To lead in AI-driven transplantation medicine, we must focus on improving our database, particularly in the areas listed here, to ensure continuous improvement in both the quality and quantity of data.

Keywords: Organ transplant registry, AI, -, -, -

Lecture Code : XS02-S1
Session Name : Xenotransplantation Symposium 2
Session Topic : Recent Progress and Future Collaboration in Solid Organ Xenotransplantation in Asia
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-2

Clinical Islet Transplantation from Allogeneic Toward Xenogeneic

Shinichi Matsumoto
Kobe University Graduate School of Medicine, Japan

Successful clinical islet transplantation was published in 2000 by the University of Alberta group and their protocol was called Edmonton protocol (1). We followed the Edmonton protocol in Japan using non-heart-beating donors in 2004 (2) and a living donor in 2005 (3) and demonstrated the reproducible outcomes. In 2020, allogeneic islet transplantation became a standard therapy in Japan. In the US, FDA approved allogenic islet transplantation as a biological product in 2023. Thus, allogeneic islet transplantation has become a standard therapy for unstable type 1 diabetic patients. However, considering huge number of type 1 diabetic patients, the shortage of human organ donor is a serious issue. To overcome the issue, we performed porcine islet xenotransplantation using microcapsules without immune suppression in New Zealand and Argentina. Clinical outcomes demonstrated the safety and the efficacy (4). Recent patients' survey 10 years after transplantation also demonstrated the long-term safety and efficacy (5). Especially, since we did not use any immunosuppressive drugs, the patients could maintain excellent health condition without side effects. Based on the clinical outcomes in New Zealand and Argentina, further clinical trials are now prepared. References 1. Shapiro AMJ, et al. Islet transplantation in seven patients with type 1 diabetes mellitus using a glucocorticoid-free immunosuppressive regimen. N Engl J Med 2000; 343: 230-8 2. Matsumoto S, et al. Successful islet transplantation from non-heart-beating donor pancreata using modified Ricordi islet isolation method. Transplantation 82, 460-465, 2006 3. Matsumoto S, et al. Insulin independence after living-donor distal pancreatectomy and islet allotransplantation. Lancet 365: 1642-1644, 2005 4. Matsumoto S, et al. Clinical benefit of islet xenotransplantation for the treatment of type 1 diabetes. EBioMedicine 2016; 12: 255-262. 5. Matsumoto et al. Patients' opinions 10 years after receiving encapsulated porcine islet xenotransplantation without immunosuppression. Xenotransplantation 2023; 30:e12798.

Keywords: islet transplantation, xenotransplantation, allogneic transplantation, type 1 diabetes

Lecture Code : XS02-S2
Session Name : Xenotransplantation Symposium 2
Session Topic : Recent Progress and Future Collaboration in Solid Organ Xenotransplantation in Asia
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-2

Genetically Modified Mini Pigs for Xenotransplantation in China

Weiwang GU
Southern Medical University, China

This presentation discusses significant advancements in xenotransplantation in China, particularly focusing on the use of genetically modified mini pigs. With the demand for organ transplants far exceeding supply, researchers are actively exploring innovative solutions to this pressing issue. Xenotransplantation, the transplantation of organs or tissues between different species, has emerged as a viable alternative to human organ donation. Mini pigs are considered ideal donors due to their anatomical similarities to humans, manageable size, and genetic modification potential. Recent developments in gene editing technologies, particularly CRISPR/Cas9, have enabled the creation of pigs that are resistant to immune rejection and free from endogenous retroviruses. Successful trials conducted by various research institutions in China have demonstrated the potential of genetically modified mini pigs in islet transplantation, kidney and liver transplants, and skin grafting for severe burns. To ensure the safety and traceability of xenotransplantation practices, a regulatory framework has been established in China. This aims to maintain public trust and ethical standards in the use of genetically modified organisms. In conclusion, genetically modified mini pigs represent a promising advancement in xenotransplantation research, providing new hope for addressing the critical shortage of human organs for transplantation. Future collaboration among researchers, regulatory bodies, and the medical community will be essential to further develop this innovative field.

Keywords: Xenotransplantation, Genetically Modified, Animal Models, Mini Pigs, Transplantation Solutions

Lecture Code : XS02-S3
Session Name : Xenotransplantation Symposium 2
Session Topic : Recent Progress and Future Collaboration in Solid Organ Xenotransplantation in Asia
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-2

Preclinical Pig to Monkey Solid Organ Transplantation Experiments in Korea

Sangil Min
Seoul National University Hospital, Republic of Korea

Solid organ xenotransplantation represents a potential solution to the ongoing shortage of human organs for transplantation. In Korea, research in this field has made significant strides, driven by advancements in genetic modification techniques and immunosuppressive protocols. Korean researchers have been at the forefront of exploring the feasibility of xenotransplantation, particularly focusing on pig to non-human-primates transplants. This lecture will review the current status of solid organ xenotransplantation in Korea, highlighting key research achievements and challenges. It will cover the ongoing preclinical experiments, including kidney, heart, and liver xenotransplantation using genetically modified pig models designed to minimize immune rejection. While clinical application is not yet a reality, Korea's contributions to the global effort in xenotransplantation are positioning the country as a leader in this cutting-edge field. This presentation will provide an overview of the current research landscape, discuss future directions, and assess the potential impact of xenotransplantation in addressing organ shortages.

Keywords: xenotransplantation, genetically modified pig, kidney, liver, heart

Lecture Code : XS02-S4
Session Name : Xenotransplantation Symposium 2
Session Topic : Recent Progress and Future Collaboration in Solid Organ Xenotransplantation in Asia
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-2

Innate Immune Responses to Foreign Cells, Especially Neutrophil Responses

SHUJI MIYAGAWA
Osaka University, Japan

"Innate immune responses to foreign cells, especially neutrophil responses". S Miyagawa, K Iemitsu, FH Wargadipura, K Gadomska, K Takase, K Nakahata, T Ueno, M Nomura, Y Kakuta, H Eguchi, A Maeda, H Okuyama Clinical trials of xenotransplantation have already begun. In order to control rejection in xenotransplantation, it is essential not only to control xenogeneic glycosyl antigens, and complement & associated coagulation factors, which are proteins of the innate immune system, but also to control NK cells, monocytes/macrophages, and neutrophil, which are cells of the innate immune system. At AWT2022 two years ago, we reported a comprehensive control strategy for monocytes/macrophages. This time, we will introduce the generally overlooked reaction of neutrophil in xenotransplantation and its control method, adding our own data. Neutrophil is called microphage, and while macrophages exhibit APC-like functions, it has a very specialized character for attacking. It is very short-lived and usually replaced every 3-7 days. The control of this neutrophil reaction against xenogeneic cells has some commonalities with NK cells and monocytes/macrophages. For example, the "missing self theory" used to control NK cells and the "don't eat me signal" used for monocytes/macrophages. We will provide a comprehensive introduction to control methods for innate immunological cells, especially neutrophil.

Keywords: Neutrophil, Xenotransplantation, HLA class Ib, CL-SP-D, CD31

Keywords: Neutrophil, Xenotransplantation, HLA class Ib, CL-SP-D, CD31

Lecture Code : CC17-S1
Session Name : Concurrent Symposium 17 (Heart)
Session Topic : Best Strategy for Donor Heart Preservation
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 6F-2

Donor Heart Damage During Transport

MinHo Ju
Pusan National University Yangsan Hospital, Republic of Korea

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Background: In heart transplantation, the transport of donor hearts is a crucial phase where various factors can impact the viability and functionality of the graft. As donor heart transplantation procedures continue to advance, the preservation and transport of these organs have become key areas of focus. This presentation aims to address the potential damage that occurs during the transport of donor hearts, which can significantly influence post-transplant outcomes. The goal is to review the existing literature and discuss critical findings related to donor heart transport challenges. Purpose: This presentation aims to explore the mechanisms and factors leading to myocardial damage during the transport of donor hearts. By examining the current literature on transport-related myocardial injury, ischemic time, mechanical stress, and the effectiveness of preservation methods, the discussion will seek to provide a comprehensive understanding of the key contributors to graft dysfunction. Discussion Points: Impact of Cold Ischemic Time and Ischemia-Reperfusion Injury: Prolonged cold ischemic time (CIT) remains a major challenge in heart transplantation. Studies have shown that as CIT extends, there is an increased risk of myocardial damage due to ATP depletion and reactive oxygen species (ROS) accumulation. This depletion compromises the cellular energy balance, leading to mitochondrial dysfunction, calcium overload, and oxidative damage. The onset of reperfusion upon revascularization further exacerbates this injury, causing structural damage to mitochondria and endothelial cells. Preservation Techniques and Their Limitations: The most commonly used technique, static cold storage (SCS), has its limitations in mitigating ischemic injury and ensuring temperature stability throughout transport. Literature suggests that newer approaches, such as hypothermic machine perfusion (HMP), may extend preservation time and reduce ischemic damage by providing oxygenated perfusate and minimizing ROS accumulation. However, the clinical implementation of these technologies faces challenges, including high costs and logistical barriers. Mechanical Stress During Transport: Transport methods, such as ground and air transport, subject donor hearts to varying levels of mechanical stress and temperature fluctuations. Studies indicate that these stressors may cause additional myocardial injury through physical strain on cardiac tissue and fluctuations in temperature. The need to standardize transport protocols and develop better insulation and shock-absorption solutions is

evident in preventing mechanical damage. Endothelial Dysfunction and Vascular Complications: The literature also highlights the importance of endothelial cell integrity during transport. Damage to the vascular endothelium due to prolonged ischemic conditions or mechanical stress can lead to inflammation and impaired microvascular perfusion, increasing the risk of primary graft dysfunction (PGD) post-transplantation. The activation of inflammatory pathways during ischemia and reperfusion can further contribute to endothelial cell apoptosis and vascular complications. Conclusion: As heart transplantation continues to evolve, understanding the critical factors affecting donor heart transport is essential to improving outcomes. Reviewing the current literature reveals key areas for intervention, such as optimizing preservation techniques, minimizing ischemic time, and reducing mechanical stress. By discussing these findings, this presentation aims to emphasize the need for refining transport protocols and exploring new preservation strategies to ensure the safe and effective delivery of donor hearts to recipients.

Keywords: heart transplant, ischemic time, graft dysfunction, transport, prognosis

Lecture Code : CC17-S4
Session Name : Concurrent Symposium 17 (Heart)
Session Topic : Best Strategy for Donor Heart Preservation
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 6F-2

Ex Vivo Machine Perfusion in DCD Heart Transplantation

Ho Jin Kim
Asan Medical Center, Republic of Korea

We discuss heart transplantation from circulatory death donors (DCD), an evolving field that could expand Korea's organ donor pool. This approach, used in heart transplants since Dr. Christiaan Barnard's landmark 1967 transplant, provides an alternative to transplants from brain-dead donors (DBD). Despite its long history, DCD heart transplantation remains complex due to ischemic injuries occurring when life support is withdrawn before the organ is retrieved. This presentation outlines key steps in the DCD process, including life support withdrawal, circulatory arrest, organ perfusion, and transplantation, comparing them with the DBD process. The presentation also examines various DCD heart procurement techniques, such as normothermic regional perfusion (NRP), normothermic machine perfusion (NMP), and the Organ Care System (OCS), also known as "Heart in a Box." These methods help mitigate ischemic injury by preserving the heart's function before transplant. NRP provides the added benefit of allowing a full functional assessment of the heart, which improves transplant viability, although it comes with increased equipment costs and ethical considerations. This presentation also highlights promising survival outcomes for DCD heart transplants, particularly when using NRP, and suggests that future growth in Korea requires legislative changes, expanded insurance coverage, and streamlined procedures. Concluding with key insights, this presentation emphasizes that DCD transplants are viable and can significantly increase available donor organs. Implementing these advances in Korea would involve overcoming logistical and ethical challenges but holds potential for broader access to heart transplants.

Keywords: Heart transplant, DCD, machine perfusion, OCS, survival

Keywords: Heart transplant, DCD, machine perfusion, OCS, survival

Lecture Code : CC18-S1
Session Name : Concurrent Symposium 18 (Lung)
Session Topic : J-K Joint Symposium 2: Nearby but Different Lung Transplant
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-3

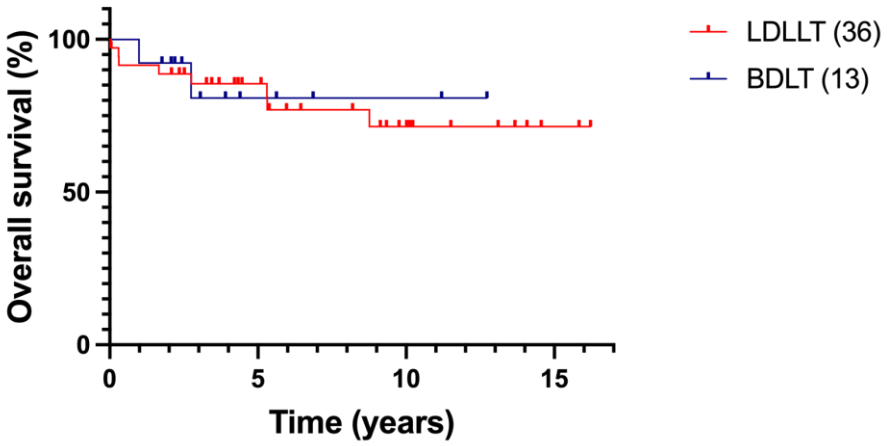
Pediatric Lung Transplantation in Japan

Daisuke Nakajima
Kyoto University, Japan

The revision of the Japanese organ transplant law allowed organ donations form pediatric brain-dead donors in 2010, which gradually increased the number of brain-dead donor lung transplantation (BDLT) for pediatric patients. However, living-donor lobar lung transplantation (LDLLT) is still required to solve the issue of donor organ shortage; thus, 86 pediatric LDLLT procedures had been conducted by the end of 2022, which accounted for 70% of the 123 pediatric lung transplant procedures in Japan. Between 2008 and 2022, we performed 49 lung transplants in pediatric patients (age <18 years), including 36 LDLLTs and 13 BDLTs. The primary indications for lung transplantation included pulmonary GVHD after hematopoietic stem cell transplantation (n=23), pulmonary hypertension (n=14), and interstitial pneumonia (n=8). Recipients were 26 males and 23 females with a median age of 10 (range: 2-17) years and a median height of 125.3 (range: 84-165) cm. LDLLT patients showed poorer pre-operative conditions than BDLT patients: Approximately 80% of the LDLLT recipients were hospitalized and 40% required mechanical respiratory support at the time of transplantation. In 36 LDLLTs, 14 single-lobe, 7 segmental, and 1 middle-lobe transplant procedures were employed for managing the oversized grafts. The posttransplant outcomes did not significantly differ between the LDLLT and BDLT procedures: ECMO support was required to manage primary graft dysfunction (PGD) in approximately 20% of the posttransplant patients; 3 LDLLT patients died because of PGD, whereas no one died in hospital after BDLT; the 1- and 5-year CLAD-free survival rates were 88.6% and 79.9% after LDLLT and 92.3% and 74.0% after BDLT, respectively; the 1- and 5-year survival rates were 91.5% and 85.5% after LDLLT and 92.3% and 80.8% after BDLT, respectively. LDLLT can be a viable life-saving option for pediatric patients with severe respiratory disorders, showing favorable posttransplant outcomes comparable to BDLT.

Keywords: pediatric, lung transplantation, living donor, brain dead donor

OS-LDLLT vs BDLT.png


Overall survival (%)
100
50
0
0
5
10
15
Time (years)
LDLLT (36)
BDLT (13)

Lecture Code : CC18-S3
Session Name : Concurrent Symposium 18 (Lung)
Session Topic : J-K Joint Symposium 2: Nearby but Different Lung Transplant
Date & Time, Place : November 16 (Sat) / 15:30-17:00 / Room 5F-3

Experience of PPFE in Japan

Haruhiko Shiiya
Hokkaido University Hospital, Japan

Pleuroparenchymal fibroelastosis (PPFE) is characterized by upper lobe predominant fibrosis involving the pleura and subpleural lung parenchyma. Idiopathic PPFE was classified as a rare idiopathic interstitial pneumonia in the American Thoracic Society/European Respiratory Society definition published in 2013. Since then, the awareness of this disease entity has increased, and several characteristic clinical features have been reported. Patients with idiopathic PPFE often have a slender body and a low body mass index, and many develop a chest wall deformity known as platythorax or flat chest. In the advanced stage of the disease, patients with PPFE often experience decreased forced vital capacity and total lung capacity, in association with flattening of the thoracic cage and volume loss in the upper lobes. Shrinking of the lungs often causes pneumothorax, often accompanied by chronic residual air in the chest cavity. No medical treatment has been shown to be effective, and lung transplantation is considered to be the only therapeutic option for patients with advanced PPFE. Based on the current knowledge, unique characteristics of patients with PPFE may result in a complicated post-transplant course. This presentation focuses on the clinicopathologic characteristics of PPFE and associated outcomes of lung transplantation for these patients based on the results of a multi-center study conducted in Japan.

Keywords: Pleuroparenchymal fibroelastosis, idiopathic pulmonary fibrosis, interstitial pneumonia, interstitial lung disease

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Challenges and Opportunities in Asian Transplantation

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Plenary Session 1
(Best Papers)

Abstract Submission No.: OP-0396

Glomerular Transcriptomic Analysis of Recurrent IgA Nephropathy after Kidney Transplantation Reveals the Involvement of B-cell Immune Response

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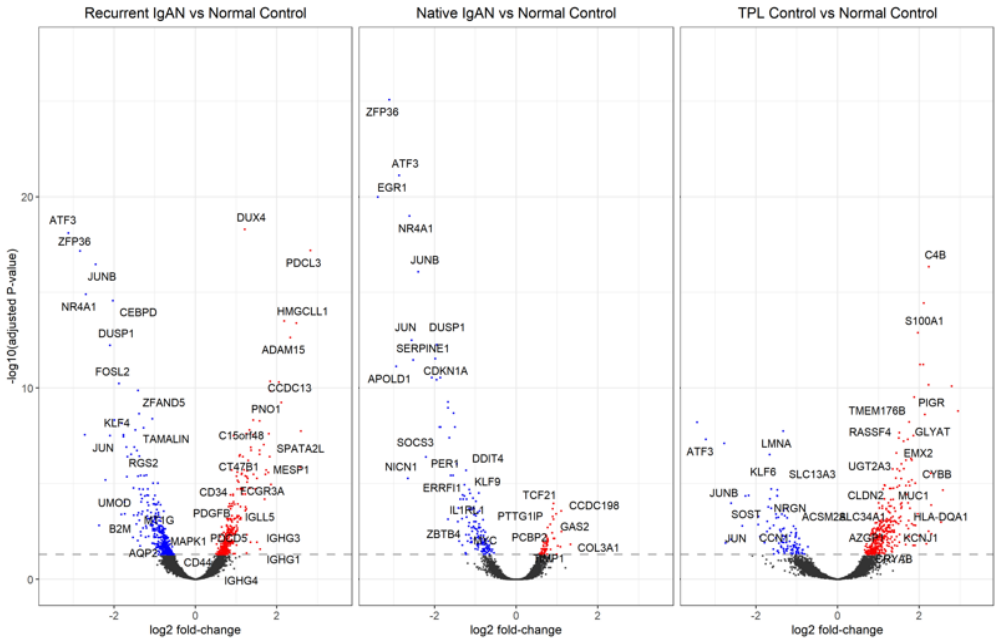
Objectives : IgA nephropathy (IgAN) is an important cause of end-stage kidney disease, and recurrent IgAN (R-IgAN) in kidney grafts after transplantation is a significant concern.
Methods : We performed spatial transcriptomic analysis on R-IgAN glomeruli to identify distinct gene expression profiles using kidney FFPE slides from 8 R-IgAN patients. As native IgAN controls, we included 15 specimens from native IgAN, including 7 crescentic IgAN. As allograft controls, 4 post-transplant biopsies taken 10 days after transplantation were obtained. As normal controls, we evaluated 11 allograft implantation biopsies without significant pathological changes in the glomerulus. Spatial transcriptomic profiling was performed using GeoMx Digital Spatial Profiler from 3 glomerular regions of interest per sample. Gene expression levels, gene ontology annotation, and differentially expressed gene (DEG) interaction mapping were analyzed using DESeq2 (p-value < 0.05), ToppGene, and the STRING database, respectively.
Results : The mean age of R-IgAN patients was 51 ± 13 years, and male was 40%. At the time of biopsy, their eGFR was 67 ± 14 mL/min/1.73m^2, and proteinuria amount was 1.45 ± 0.87 g/g. The transplantation vintage was 3.8 ± 2.7 years. During 5.5 ± 3.5 years of follow-up, 5 R-IgAN patients progressed to graft failure. Glomerular transcriptomic analysis revealed 318 upregulated and 297 downregulated DEGs exclusively in R-IgAN, different from normal controls, allograft controls, or even native IgAN controls. R-IgAN glomeruli showed upregulation of genes associated with mesangial proliferation (PDGFB, CD34, CD44). Additionally, they showed significant enrichment in B-cell mediated immunity-related signals, including the leading-edge genes FCGR3A, IGHG1, IGHG3, IGHG4, and IGLL5, which were associated with progression to death-censored graft failure.
Conclusions : In this study, we identified distinct transcriptomic signatures of the glomeruli of R-IgAN patients, represented by upregulated B-cell mediated immunity-related genes associated with poor graft prognosis, and suggested potential treatment targets.

volcano plot for abstract v5.png


Recurrent IgAN vs Normal Control
Native IgAN vs Normal Control
TPL Control vs Normal Control
-log10(adjusted P-value)
log2 fold-change
ATF3
ZFP36
JUNB
NR4A1
CEBPD
DUSP1
FOSL2
ZFAND5
KLF4
TAMALIN
JUN
RGS2
UMOD
B2M
AQP2
MAPK1
CD44
IGHG4
IGHG1
IGHG3
IGLL5
PDGFB
CD34
ECGR3A
CT47B1
MESP1
C15orf48
SPATA2L
PNO1
CCDC13
ADAM15
HMGCLL1
PDCL3
DUX4
ZFP36
ATF3
EGR1
NR4A1
JUNB
JUN
DUSP1
SERPINE1
APOLD1
CDKN1A
SOCS3
NICN1
PER1
DDIT4
KLF9
ERRFI1
IL1RL1
ZBTB4
TCF21
CCDC198
PTTG1IP
GAS2
PCBP2
COL3A1
C4B
S100A1
TMEM176B
PIGR
RASSF4
GLYAT
ATF3
LMNA
EMX2
KLF6
SLC13A3
UGT2A3
CYBB
JUNB
CLDN2
MUC1
SOST
NRGN
ACSM2B
LC34A1
HLA-DQA1
JUN
CCN1
AZGP1
KCNJ1
CRYAB

Abstract Submission No.: OP-0180

3D-printed omentum patch transplantation reduces kidney fibrosis after acute kidney injury

Wencheng Jin[1], Cho Bogyeong[3], Lee Myoungseok[3], Lee Jeonghwan[3], Ryu Jina[2], Kim Boyun[2], Lee Jungpyo[3]
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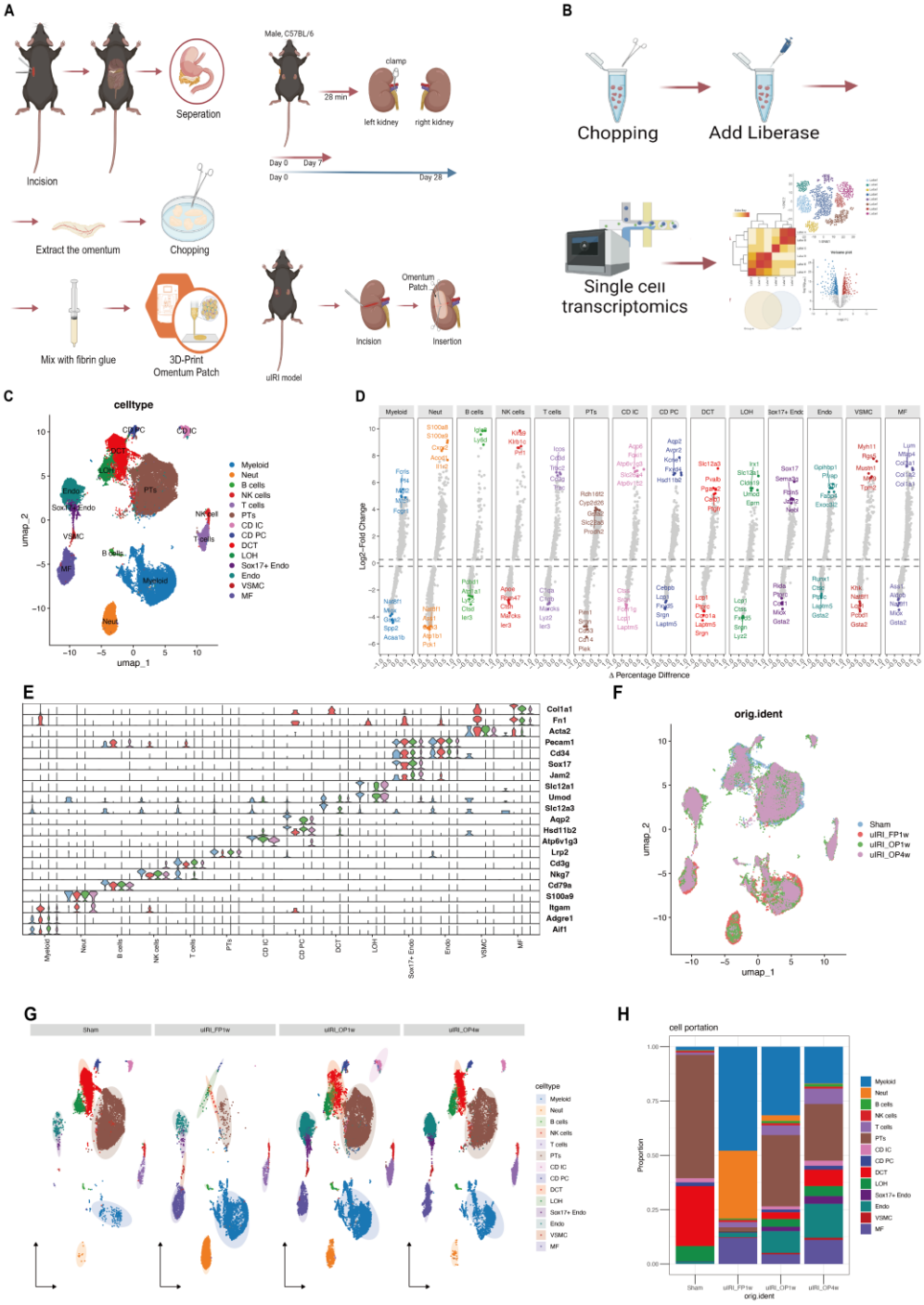
[2]Department of R&D Center, ROKIT Healthcare, Inc., Seoul, Republic of Korea., Korea, Republic of
[3]Department of Nephrology, Seoul National University Boramae Medical Center, Korea, Republic of

Objectives : The omentum has long been considered to have the ability to migrate to injured organs and promote their healing. These healing characteristics of the omentum are attributed to the high content of its progenitor cells and growth and angiogenesis factors. We aimed to study whether the omentum patch transplantation can reduce kidney fibrosis in the acute kidney injury (AKI) to chronic kidney disease (CKD) transition.
Methods : AKI to CKD transition was induced by unilateral ischemia-reperfusion injury (UIRI) in 7- to 8-wk-old male C57BL/6 mice. 3D-printed omentum or fibrin patch were made by using mechanically micronized omentum or fibrin as a bio-ink. Then, the bio-printed patches were transplanted under the renal capsule in both sham and UIRI group. Kidney samples from the B6 mouse IRI model were collected at weeks 1 and 5. Single-cell RNA sequencing (scRNA-seq) were performed on UIRI+OP 1W,UIRI+FP 1w,UIRI+OP 4w kidney samples.
Results : scRNA-seq analyses of a combined dataset from the two animal models identified 14 cell clusters. During the first week of the IRI model, the Omentum patch group showed increased tissue survival of proximal tubules, endothelial cells, and Henle's loops compared to the control group. In contrast, the control group had more inflammatory cell infiltration compared to the Omentum patch group. Cellchat analysis revealed cell-to-cell interactions specific to Myoled and proximaltubular cells and myofibroblasts. Injured proximal Tubular cells recruit Myeloid via SPP1-CD44 and lead to renal fibrosis via activation of the TGF-b pathway, which is inhibited by the omentum patch via its anti-inflammatory and stem cell properties. In the cellular communication,Histologic examination and ultrasound evaluation confirmed that the Omentum patch alleviated renal fibrosis at week 4 in the IRI model.
Conclusions : Omentum patch attenuates kidney fibrosis in the model of the acute kidney injury (AKI) to CKD transition.

abstract p1.png


A
Incision
Seperation
Extract the omentum
Chopping
Mix with fibrin glue
3D-Print
Omentum Patch
Male, C57BL/6
28 min
clamp
left kidney
right kidney
Day 0
Day 7
Day 28
uIRI model
Incision
Omentum Patch
Insertion
B
Chopping
Add Liberase
Single cell transcriptomics
C
celltype
umap_1
umap_2
Myeloid
Neut
B cells
NK cells
T cells
PTs
CD IC
CD PC
DCT
LOH
Sox17+ Endo
Endo
VSMC
MF
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Log2-Fold Change
Δ Percentage Difference
E
Col1a1
Fn1
Acta2
Pecam1
Cd34
Sox17
Jam2
Slc12a1
Umod
Slc12a3
Aqp2
Hsd11b2
Atp6v1g3
Lrp2
Cd3g
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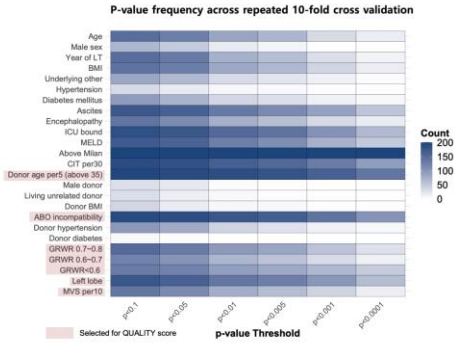
Abstract Submission No.: OP-0364

QUALITY score : development of integrative prognostic index for living donor liver using multicentric registry data

Deok-Gie Kim, Dong Jin Joo, Jae Geun Lee, Eun-Ki Min, Hwa-Hee Koh, Minyu Kang, Young Jin Yoo, Myoung Soo Kim
Department of Liver Transplantation and Hepatobiliary Surgery, Severance Hospital, Korea, Republic of

Objectives : Donor factors significantly affect the prognosis of living donor liver transplantation (LDLT). This study aimed to develop integrative prognostic index for living donor liver using Korean Organ Transplantation Registry (KOTRY)
Methods : Data of 4227 eligible LDLT patients was randomly assigned to derivation and validation cohorts with 7:3 ratio. From derivation cohort, six donor variables were selected from repeated 10-fold cross validation. QUALITY (QUick Assessment of LIving donor liver for LDLT Yeild) score was calculated with mean value of each coefficient adjusted with recipient factors. QUALITY score was then validated the prognostic performance in the validation cohort.
Results : Formula of QUALITY score was "exp (0.181*Donor age per 5 [above 35] + 0.504 if ABO-incompatible + [0.646 if GRWR 0.7~0.8 or 0.78 if GRWR 0.6~0.7 or 1.475 if GRWR<0.6)]+ 0.561 if Left lobe + 0.235*macroveiscular steatosis [MVS] per 10)". C-indices of QUALITY score were 0.623 in derivation and 0.622 in validation cohort. Median value was 1.7 (IQR 1.1-1.9) in both cohorts and maximum was 20.2 in derivation and 17.6 in validation cohort. Adjusted cubic spline showed linear correlation between QUALITY and graft loss in both cohorts. In validation cohort, 5-year graft survival was well-stratified by QUALITY score group (93.2% for QUALITY 1 [ideal donor] vs. 91.2% for QUALITY 1~1.5 vs. 82.6% for QUALITY 1.5~2 vs. 84.3% for QUALITY 2~3 vs. 80.7% for QUALITY 3~4 vs. 64.3% for QUALITY ³4, P<0.001). This survival difference according to QUALITY increasement was proved to be independent from recipient risk factors in multivariable analyses.
Conclusions : QUALITY score represents integrative prognostic potential of living liver graft irrespective of recipient risk. In the given recipient situation, QUALITY could be used for donor selection and proceeding of LDLT in terms of LT outcomes.

quality.jpg



QUALITY score =
exp (0.181*Donor age per 5 [above 35] +
0.504 if ABO-incompatible +
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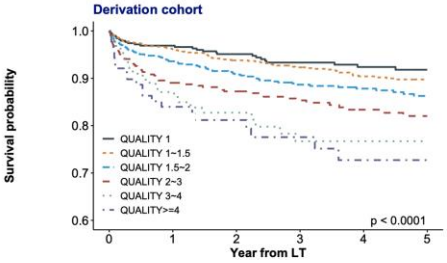
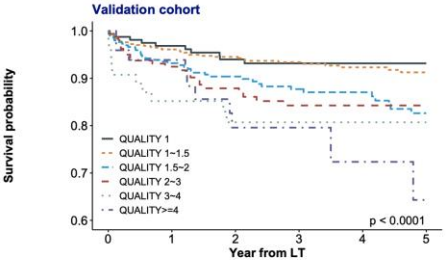
0.561 if Left lobe + 0.235*MVS per 10)



Number at risk

QUALITY 1	387	342	287	223	174	120
QUALITY 1~1.5	1262	1087	843	646	463	327
QUALITY 1.5~2	696	586	465	353	261	170
QUALITY 2~3	407	328	256	195	140	93
QUALITY 3~4	117	87	63	45	33	23
QUALITY>=4	89	64	49	37	29	19



Number at risk

QUALITY 1	160	144	119	94	79	58
QUALITY 1~1.5	545	454	372	276	197	132
QUALITY 1.5~2	299	249	194	142	110	67
QUALITY 2~3	162	131	105	72	56	36
QUALITY 3~4	54	42	32	22	17	9
QUALITY>=4	49	41	24	17	9	7

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Plenary Session 2
(Best Papers)

Abstract Submission No.: OP-0121

Machine Learning for 1-Year Mortality Prediction in Lung Transplant Recipients: The Korean Organ Transplantation Registry

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[2]Department of Pulmonology, Samsung Medical Center, Korea, Republic of
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[4]Department of Thoracic and Cardiovascular Surgery, Severance Hospital, Korea, Republic of
[5]Department of Pulmonology, Severance Hospital, Korea, Republic of

Objectives : Preoperative prediction of 1-year post-transplant survival can assist in making better clinical decisions.
Methods : Data from the Korean Organ Transplantation Registry were used to develop and validate a deep learning-based model for predicting 1-year survival following lung transplantation. A total of 240 cases were randomly divided into development and validation datasets. We first identified the importance of 17 clinical factors related to 1-year mortality and then developed and validated a model using the top 10 factors.
Results : Of the 240 patients, 55 (22.92%) died or underwent retransplantation due to graft failure within 1 year, while 185 survived. The 10 factors used in the prediction model included preoperative steroid use, creatinine, age, diabetes, PRA peak MFI, diagnosis, pneumonia before transplantation, bacteremia before transplantation, BUN, and positive HLA crossmatching. The MLP models incorporating these 10 factors performed well, with an area under the curve (AUC) of 0.775 and an accuracy of 0.800.
Conclusions : Our machine learning-based approach accurately predicts 1-year mortality in lung transplant recipients using a minimal set of pretransplant factors. This model has the potential to enhance patient selection and improve post-transplant outcomes.

Abstract Submission No.: OP-0161

The Longitudinal Incidence of Chronic Kidney Disease After Lung Transplantation in Korea: A 15-Year Study

Soyoung Park[1], Jong-Hyun Jeong[1], Ah Young Lee[1], Kyu-Nam Heo[1], Young-Mi Ah[2], Ji Min Han[3], Hyun Joo Lee[4], Ju-yeun Lee[1]
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[2]Department of Pharmacy, Yeungnam University, Korea, Republic of
[3]Department of Pharmacy, Chungbuk National University, Korea, Republic of
[4]Department of Thoracic and Cardiovascular Surgery, Seoul National University Hospital, Korea, Republic of

Objectives : Lung transplantation poses a high risk of organ rejection, requiring intensive immunosuppressive therapies. Calcineurin inhibitors like tacrolimus, commonly used in these therapies, can cause nephrotoxicity, increasing the risk of chronic kidney disease (CKD). This study aimed to determine the incidence of CKD following lung transplantation and compare incidence rates from 2007 to 2021.
Methods : A retrospective cohort analysis was conducted using health insurance claims data from adult patients who received their first lung transplant between January 1, 2007, and December 31, 2021. Patients with pre-existing end-stage renal disease were excluded. CKD was identified through CKD or dialysis-related codes or a history of kidney transplantation. Hazard ratios were calculated using Cox regression, accounting for competing risks.
Results : The cohort included 922 patients, 62.4% of whom were male, with 93.5% undergoing bilateral lung transplantation. Among these, 74 patients were included from 2007 to 2011, 271 from 2012 to 2016, and 583 from 2017 to 2021. The one-year cumulative mortality rate decreased over time, from 54.1% in 2007–2011 to 38.5% in 2012–2016, and further to 27% in 2017–2021. Overall, 20.3% of patients developed new-onset CKD within one year post-transplantation, with 54.5% occurring within the first three months, 20.9% between three to six months, and 24.6% between six months and one year. The incidence of CKD within one year was higher in 2017–2021 (22%) compared to 6.8% in 2007–2011 and 19.9% in 2012–2016. The risk of CKD increased with age (Hazard ratios: 35–49 years: 1.46; 50–64 years: 2.09; 65 years and older: 2.39). Additionally, basiliximab was associated with a 0.59 times lower risk of CKD, while CRRT during lung transplant hospitalization increased the risk by 3.15 times.
Conclusions : CKD is a common, early complication after lung transplantation, with increased incidence in recent years, necessitating improved monitoring and management, particularly in higher-risk patients.

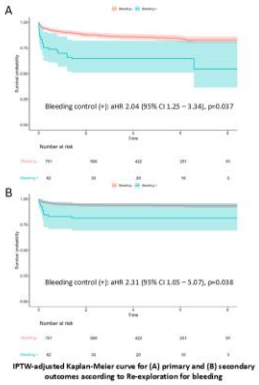
Abstract Submission No.: OP-0251

The Impact of Postoperative Re-exploration for bleeding and Risk Analysis in Heart Transplantation based on the Korean Organ Transplantation Registry (KOTRY)

Kitae Kim[1], Tae Hyun Park[1], Hong Rae Kim[1], Ho Jin Kim[1], Jae Suk Yoo[1], Joon Bum Kim[1], Cheol Hyun Chung[1], Jae-Joong Kim[2], Myoung Soo Kim[3], Sung-Ho Jung[1]
[1]Department of Thoracic and Cardiovascular Surgery, Asan Medical Center, Korea, Republic of
[2]Department of Internal Medicine, Asan Medical Center, Korea, Republic of
[3]Department of Surgery, Yonsei University College of Medicine, Korea, Republic of

Objectives : It is common knowledge that postoperative bleeding adversely impacts on clinical outcomes following cardiac surgeries; however, studies on its impact in heart transplant patients are scarce. This study aimed to evaluate the impact of postoperative re-exploration for bleeding on clinical outcomes and risk analysis for postoperative bleeding in heart transplantation using Korean Nationwide Cohort.
Methods : Using data from the Korean organ transplantation registry, the cohort included adult patients who underwent heart transplantation from 2014 to 2021. Primary outcome was all-cause death, and secondary outcome was a death due to infection. Inverse Probability of Treatment Weighting and Cox proportional hazard models was used to compare clinical outcomes between the two groups in terms of postoperative re-exploration for bleeding. To estimate the probability of death under the presence of competing risks, we used the cumulative incidence function for death due to infection and death from other causes based on cause-specific hazard function. To facilitate interpretation, optimal cutoff point for CPB time was determined based on the highest Youden index score, considering both sensitivity and specificity.
Results : Among the 813 patients (mean age, 52.8 years; 241 female), 62 underwent re-exploration for bleeding following surgery. Postoperative re-exploration for bleeding was associated with an increase in all-cause mortality and death due to infection (adjusted Hazard Ratio (HR): 2.04, 95% CI 1.25–3.34, p=0.037; and subdistributed HR: 2.69, 95% CI 1.13–6.41, P=0.0261). CPB time was associated with the rate of re-exploration for bleeding on multivariate Logistic Regression analysis (adjusted Odds Ratio (OR): 1.11, 95% CI 1.06-1.15, p<0.001). Based on the highest Youden index score, the optimal cutoff points for CPB time were 167 minutes.
Conclusions : In patients undergoing transplantation, postoperative re-exploration for bleeding was significantly associated with poor clinical outcomes. CPB time was associated with an increased risk of postoperative re-exploration for bleeding.

AbstractFigureandTable.png



IPTW-adjusted Kaplan-Meier curve for (A) primary and (B) secondary outcomes according to Re-exploration for bleeding

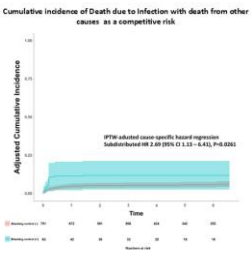


Table 3. Multivariate Logistic Regression to Examine the Predictors of Postoperative Re-exploration for Bleeding using stepwise technique.

Variables	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)*	P-value
CPB time, per 10 minutes	**1.10 (1.04-1.17)**	**<0.001**	**1.11 (1.06-1.15)**	**<0.001**
Hemoglobin	0.85 (0.72-0.99)	0.038	0.89 (0.79-1.00)	0.051
Valvular heart disease	0.58 (0.03-11.18)	0.72	0.21 (0.03-1.63)	0.21

**Adjusted factors: Age, Female, BMI, DM, HTN, Cancer, GFR, EONOS , Hb, platelet count, CPB time, operation time, ischemic heart disease, valvular heart disease, congenital heart disease, cardiomyopathy, myocarditis, sarcoidosis, retransplantation, intravenous drug usage, intravenous diuretics usage, intravenous inotropics usage, dobutamine usage, dopamine usage, milrinone usage, norepinephrine usage, vasopressin usage, ventilator application, ECMO application, VAD insertion state, hemodialysis, continuous renal replacement therapy application, preoperative ejection fraction.*

CI, confidence interval; HR, hazard ratio

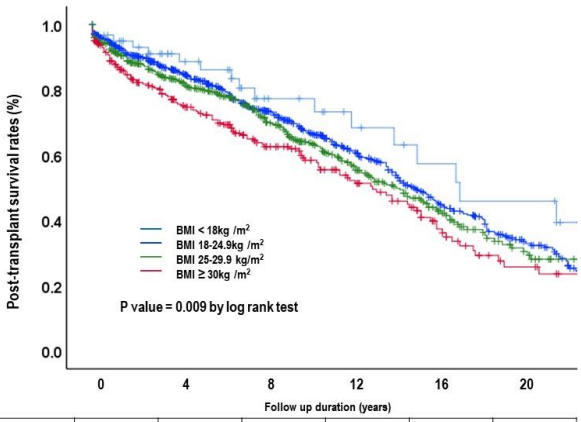
Abstract Submission No.: NP-0033

Impact of Obesity on Long Term Post Heart Transplantation Outcomes

Darae Kim[1], In-Cheol Kim[2], Jong-Chan Youn[3], Woo-Sung Chang[3], Mi-Hyang Jung[3], Jin-Jin Kim[3], Jin-Oh Choi[1], Jon A. Kobashigawa[4]
[1]Department of Cardiology, Samsung Medical Center, Korea, Republic of
[2]Department of Cardiology, Keimyung University Dongsan Medical Center, Korea, Republic of
[3]Department of Cardiology, The Catholic University of Korea Seoul St. Mary's Hospital , Korea, Republic of
[4]Department of Cardiology, Cedars-Sinai Medical Center, United States

Objectives : Obesity is an ongoing pandemic, and the rising trend of body mass index (BMI) in heart transplant (HTx) recipients is well known. However, the long term post-HTx outcomes of obese patients are not clearly documented.
Methods : Among 1,787 consecutively enrolled adult HTx recipients between September 1990 and June 2022, patients were categorized into BMI groups: underweight (<18 kg/m²), normal weight (18.0-24.9 kg/m²), overweight (25-29.9 kg/m²), and obese (≥30 kg/m²). The primary outcome was post-HTx survival, with secondary outcomes including primary graft dysfunction, treated rejection, coronary allograft vasculopathy, retransplant, and nonfatal major adverse cardiac event.
Results : Over time, there was a significant increase in obese recipients (BMI ≥30 kg/m²) and they were more likely to have comorbidities such as diabetes and hypertension, experience significantly longer wait times, and more frequently received undersized donors compared to those with normal weight. During the median follow up duration of 6 years after HTx, obese recipients showed significantly lower post-HTx survival compared to those with normal weight (P-value=0.009) (Figure). In multivariable analysis, obese patients had a significantly higher risk of post-transplant mortality, primary graft dysfunction, and any treated rejection even after adjusting relevant clinical variables.
Conclusions : Obese HTx recipients demonstrated a significantly higher risk of death, primary graft dysfunction, and any treated rejection emphasizing the necessity of active, multidisciplinary obesity management before HTx.

Fig4.jpg



BMI < 18kg /m^2	61	36	20	13	8	5
BMI 18-24.9 kg /m^2	849	554	342	189	104	44
BMI 25-29.9 kg/m^2	593	375	238	118	49	17
BMI ≥ 30kg /m^2	284	160	97	56	23	11

Figure 4. KM curves for post-transplant su

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Vanguard Award Session

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0199

Donor-derived cell-free DNA identifies subclinical antibody-mediated rejection in de novo donor-specific antibody-positive kidney transplant recipients

Ara Cho[1], Ahram Han[1], Juhan Lee[2], Jae Berm Park[3], Cheol Woong Jung[4], Yong Chul Kim[5], Sehoon Park[5], Jongwon Ha[1], Sangil Min[1]
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[2]Department of Internal Medicine, Seoul National University Hospital, Korea, Republic of
[3]Department of Surgery, Division of Transplant Surgery, Severance Hospital, Korea, Republic of
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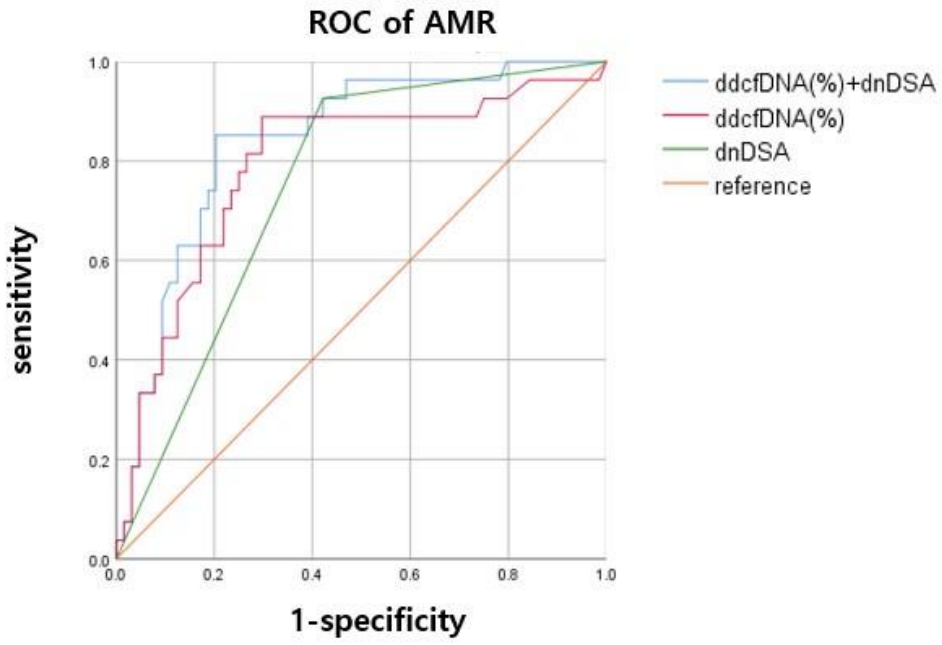
[5]Department of Surgery, Korea University Anam Hospital, Korea, Republic of

Objectives : Antibody-mediated rejection (ABMR) remains a significant diagnostic and therapeutic challenge for kidney transplant recipients. While histological examination is the gold standard diagnostic method, it is invasive. Donor-specific antibodies (DSA) and donor-derived cell-free DNA (ddcf-DNA) represent potential alternatives for predicting rejection. The study aims to predict active ABMR through the combination of DSA and ddcf-DNA in kidney transplant recipients who maintain stable renal function after post-transplantation.
Methods : A total of 109 kidney transplant recipients aged 18 or older were enrolled across five tertiary hospitals in Korea. We administered serum ddcf-DNA and DSA tests of patients with stable kidney function since February 2023. The histologic results of kidney biopsy were compared with the test outcomes. Patients with ABO or HLA incompatible kidney transplantation were excluded.
Results : We examined a total of 109 patients, with 68 (62.4%) being male, and the mean age was 47 years. Among them, 63 patients (57.8%) showed DSA positivity. In the DSA-positive group, the median ddcfDNA was 1.29% (IQR: 0.41-1.88), while the median ddcfDNA was 0.31% (IQR: 0.22-0.72) in the DSA-negative group. 27 patients were diagnosed of acute ABMR in histology. The area under the curve (AUC) for DSA positivity in predicting ABMR is 0.752 (95% CI: 0.650-0.854, p-value <0.001), while for ddcfDNA, it is 0.791 (95% CI: 0.683-0.900, p-value <0.001). The combination of dnDSA and ddcfDNA yields an AUC of 0.840 (95% CI: 0.754-0.927, p-value <0.001) for predicting ABMR. The positive predictive value of ddcfDNA at 0.7% to detect ABMR in DSA+ patients was 40.4 %, while the negative predictive value was 96.0%.
Conclusions : The combination of ddcf-DNA and DSA testing holds value as a noninvasive diagnostic approach for ABMR in kidney transplant recipients with stable renal function.

figure_ddcfDNA.jpg



variables	AUC	*p*-value
ddcfDNA(%)+dnDSA	0.840 (0.754-0.927)	<0.001
ddcfDNA(%)	0.791 (0.683-0.900)	<0.001
dnDSA	0.752 (0.650-0.854)	<0.001

Abstract Submission No.: OP-0196

Long-term Results of Anti-Hepatitis B Core Antibody-Positive Living Liver Donors after Donor Hepatectomy

Miu Yee Chan[1], Tiffany Cho-Lam Wong[1], Sui-Ling Sin[1], Wing-Chiu Dai[1], James Yan-Yue Fung[2], Albert Chi-Yan Chan[1]
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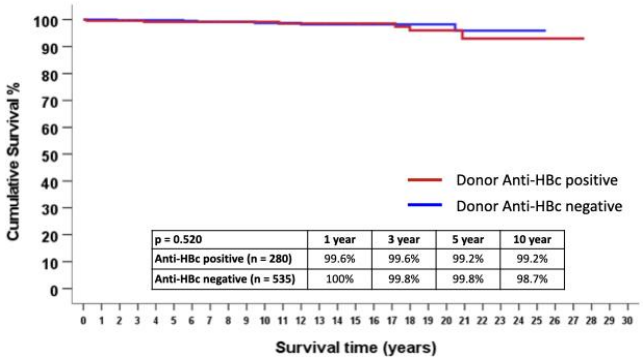
[2]Department of Medicine, The University of Hong Kong, Hong Kong, China

Objectives : Anti-hepatitis B core antibody (anti-HBc) positive grafts were being utilized in living donor liver transplantation with satisfactory results in recipients. However the long term outcomes of these living donors were still lacking in current literature. This study aims to report and compare the long term results of donors with anti-HBc positive and negative status.
Methods : Donors who underwent hepatectomy for living donor liver transplantation during the period of January 1993 to December 2023 in Queen Mary Hospital, Hong Kong were included. Donors without anti-HBc antibody status available were excluded from the study. Data was retrived from a prospectively collected database. Donors' background characteristics, peri-operative data, long-term donor survival and graft survival were compared between anti-HBc positive and negative groups.
Results : 815 donors were included in the above period. 280 donors were anti-HBc positive (34.4%) and 535 were anti-HBc negative (65.6%). Median follow-up period was 83.6 months. There was no documented hepatitis B (HBV)-related events in both groups including cirrhosis and HBV flare in both groups. 5-year donor survival rates for anti-HBc positive group and negative group were 99.2% and 99.8% respectively (p=0.520). 5-year graft survival rates were 87.5% and 83.1% respectively (p=0.169). Overall mortality rates were 2.1% and 1.1% respectively (p=0.399).
Conclusions : Donor hepatectomy in anti-HBc positive donors has comparable long term outcomes with anti-HBc negative donors. In countries with organ shortage, living donor liver transplantation is a viable option in anti-HBc positive donors.

Donor Survival.001.jpeg.001.jpeg



p = 0.520	1 year	3 year	5 year	10 year
Anti-HBc positive (n = 280)	99.6%	99.6%	99.2%	99.2%
Anti-HBc negative (n = 535)	100%	99.8%	99.8%	98.7%

Figure 1. Donor Survival stratified by anti-HBc status

Abstract Submission No.: NP-0223

Impact of Psychological Problems on Outcomes and Mortality in Lung Transplant Recipients

Hye Young Hong[1], Eun Young Kim[1], A La Woo[1], Song Yee Kim[1], Young Ho Yang[2], Ha Eun Kim[2], Jin Gu Lee[2], Moo Suk Park[1]
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Objectives : Lung transplantation (LTX) is the only treatment for end-stage lung diseases. However, the process is fraught with psychological challenges. LTX candidates often experience prolonged stress, anxiety, and depression, which can significantly impact their overall health and post-transplant recovery. Recognizing this, international guidelines recommend pre-transplant mental health evaluations. Post-operatively, delirium emerges as a common complication, characterized by acute confusion and cognitive impairment. This study aims to analyze the relationship between pre-transplant psychiatric assessments, and long-term outcomes in LTX recipients.
Methods : We retrospectively reviewed the medical records of patients who underwent LTX at Severance Hospital from January 2013 to March 2023. We analyzed the incidence of psychiatric problems before and after LTX. Using logistic regression analysis, we identified risk factors for the development of postoperative delirium. Additionally, we performed survival analysis using Kaplan-Meier curves and log-rank tests to evaluate patient mortality.
Results : The study included 398 LTX recipients. Pre-transplant routine psychiatric assessments revealed mild anxiety and depression, with mean Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI) scores of 13.5 and 15.1, respectively. Pre-transplant psychiatric special consultations were required for 113 patients (28.4%), increasing to 321 patients (80.4%) post-transplant. Delirium occurred in 45% of patients within 90 days post-transplant, averaging 12.5 days after surgery. Patients with pre-transplant delirium (adjusted odds ratio [aOR] 1.14, 95% confidence interval [CI] 1.05–1.23), long operation time (aOR 1.34, 95% CI 1.02–1.78), and high BAI score (aOR 1.04, 95% CI 1.00–1.08) had a higher risk of postoperative delirium. Furthermore, patients who developed postoperative delirium had a significantly higher 2 and 5-year mortality rate.
Conclusions : Pre-transplant anxiety increases the risk of postoperative delirium, which significantly affects long-term mortality. Comprehensive psychiatric evaluation and management are crucial for improving outcomes in LTX patients.

ATW Figure.png

Table1. Baseline characteristics of study population

Characteristics	Total, N=356
Age, years	54.4±11.4
Sex	
Male	257 (64.6)
Female	141 (35.4)
BMI (kg/m²)	21.3±3.8
Charlson Comorbidity Index	2.2±1.3
Diagnosis before lung transplantation	
COPD	20 (5.6)
ILD including IPF, CTD-ILD, and other ILD	307 (77.1)
Bronchiectasis	25 (6.3)
Primary pulmonary hypertension, Eisenmenger syndrome	12 (3.0)
Chronic pulmonary GVHD	31 (7.8)
Others[1]	4 (1.0)
6 minutes walking distance (m)[2]	245.8±142.7
Pulmonary function test before transplantation[3]	
FVC (L)	1.71±0.7
FVC (%)	44.2±15.9
FEV₁ (L)	1.27±0.5
FVC (%)	43.9±17.3
Main caregiver	
Spouse	260 (65.3)
Parents	33 (8.3)
Adult children	67 (16.8)
Siblings	29 (7.3)
Others	9 (2.3)
BAI score	13.5±10.0
BDI score	15.1±8.6
Pre-transplant psychiatric consultation	113 (28.4)
Pre-transplant delirium	31 (7.8)
Oxygen demand before transplantation (L/min)	231 (58.0)
0–3	120 (51.9)
4–6	74 (32.0)
> 6	5 (2.2)
High flow nasal cannula oxygen	32 (13.9)
Pre-transplant ICU admission	170 (42.7)
ICU stay (days)	23.2±50.2
Pre-transplant application of MV	167 (42.0)
Pre-transplant MV only	54 (13.6)
Pre-transplant ECMO only	11 (2.8)
Pre-transplant MV + ECMO	113 (28.4)
Duration of MV (days)	33.1±34.5
Use of ECMO before transplantation	124 (31.2)
Duration of ECMO before transplantation (days)	10.2±15.0
Use of ECMO after transplantation	168 (42.2)
Duration of ECMO after transplantation (days)	4.4±6.4
Number of transplanted lungs	
Bilateral lung transplant	380 (95.5)
Single lung transplant	18 (4.5)
Operation time (hour)	6.5±1.2
Anesthesia time (hour)	8.0±1.3
Post operative bleeding	59 (14.8)
Re-operation (Bleeding control, BPF repair, Lung resection)	83 (20.9)
Post operative acute kidney injury within 2 weeks	73 (18.3)
Primary graft dysfunction within 72 hours, grade 3	162 (40.7)
Acute rejection	16 (4.0)
Post operative ammonia level (μmol/L)	50.9±19.1
Intensive care delirium screening checklist (ICDSC)	2.8±1.7
Post-transplant psychiatric consultation	321 (80.7)
Post-transplant psychiatric medication prescription	297 (75.0)
Post-transplant delirium within 90 days	179 (45.0)
Onset of delirium after transplantation (days)	12.5±17.0
CLAD within 1 year post transplant	10 (2.5)
Long term clinically suspected of CLAD	84 (21.1)
Hospital-stay (days)	94.2±105.4
Unscheduled re-admission within 3 months	134 (33.7)
In-hospital mortality	68 (17.1)
1-year mortality	113 (28.4)
2-year mortality	147 (36.9)
5-year mortality	180 (45.2)

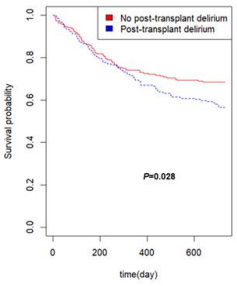
Data are presented as numbers (percentages) or mean (standard deviation)
BMI=body mass index, COPD=chronic obstructive pulmonary disease, ILD=interstitial lung disease, IPF=idiopathic pulmonary fibrosis, CTD-ILD=connective tissue disease-interstitial lung disease, GVHD=graft versus host disease, FVC=forced vital capacity, FEV₁=forced expiratory volume in the first second, BAI=beck anxiety inventory, BDI=beck depression inventory, ICU=intensive care unit, MV=mechanical ventilation, ECMO=extracorporeal membrane oxygenation, BPF=bronchopleural fistula, CLAD=chronic lung allograft dysfunction.
[1] Others include tuberculosis destroyed lung, primary ciliary dyskinesia, post infectious acute respiratory distress syndrome and pneumoconiosis.
[2] 264 Patients participated in a 6 minutes walking test
[3] 315 Patients underwent pulmonary function tests

Table 2. Risk factors associated with post-transplant delirium

	Univariate		Multivariate	
	OR (95% CI)	*P* value	aOR (95% CI)	*P* value
Age, Year	1.02 (1.00–1.04)	0.022	1.01 (0.97–1.05)	0.607
Sex, Male	1.53 (1.01–2.33)	0.048	1.00 (0.50–1.97)	0.993
BMI (Kg/m²)	1.08 (1.03–1.14)	0.004	1.14 (1.05–1.23)	0.002
CCI, Score	1.15 (0.98–1.35)	0.087	1.11 (0.80–1.53)	0.546
6 min walking distance (m)	1.00 (0.99–1.00)	0.447		
FVC (L)	0.84 (0.60–1.17)	0.306		
FEV₁ (L)	1.29 (0.86–1.95)	0.224		
Preoperative MV+ECMO	1.75 (1.13–2.72)	0.013	0.89 (0.42–1.85)	0.750
Bilateral lung transplantation	0.46 (0.14–1.23)	0.142		
Operation time (hour)	1.26 (1.06–1.49)	0.008	1.34 (1.02–1.78)	0.039
Postoperative bleeding	1.12 (0.64–1.96)	0.678		
Re-operation	1.18 (0.72–1.91)	0.508		
Acute rejection	1.60 (0.59–4.57)	0.339		
Primary graft dysfunction	1.14 (0.76–1.71)	0.520		
Postoperative AKI	1.08 (0.63–1.80)	0.761		
Postoperative ammonia level				
Preoperative delirium	3.27 (1.51–7.67)	0.004	2.54 (0.80–8.78)	0.122
Preoperative psychiatric consultation	1.43 (0.92–2.22)	0.109		
BAI, score	1.02 (1.00–1.05)	0.076	1.04 (1.00–1.08)	0.048
BDI, score	1.03 (1.00–1.07)	0.028	1.01 (0.97–1.05)	0.738

OR=odd ratio, aOR=adjusted odd ratio, BMI=body mass index, CCI=Charlson comorbidity index, FVC=forced vital capacity, FEV₁=forced expiratory volume in the first second, MV=mechanical ventilation, ECMO=extracorporeal membrane oxygenation, AKI=acute kidney injury, BAI=beck anxiety inventory, BDI=beck depression inventory.

Figure 1. Kaplan-Meier survival curve by postoperative delirium



Abstract Submission No.: OP-0400

A Role of Intrahepatic Lymphocytes Expressing PD-1 in Inducing Mouse Spontaneous Liver Transplant Tolerance

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Objectives : The liver has the unique capacity to locally regulate inflammation related to both innate and acquired immunity by various intrahepatic immune cells. However, which immune cells contribute to the induction of liver spontaneous tolerance are not completely elucidated. In this study, we investigated the immunological mechanisms to induce spontaneous immune tolerance focusing on intrahepatic lymphocytes in a mouse liver transplantation model.
Methods : Orthotopic liver transplantation from C57BL/6J (H-2K^{b}) to C3H/HeNCrl (H-2K^{k}) mouse was performed and evaluated the graft survival. Syngeneic recipients were used as controls. Serological evaluation and histological assessment and FACS analysis of grafts were performed. Anti-PD-1 mAb was administered intraperitoneally to recipient C3H mice on day 0 and day 3.
Results : Liver allograft were accepted over 100 days spontaneously without any immunosuppressant. The liver enzyme levels of allogeneic recipients were comparable to that of syngeneic controls. Despites slight infiltrating lymphocyte around the portal area, there were no tissue destruction. The PD-1 expression on graft infiltrating CD4^{+} T cells and CD8^{+} T cells were significantly higher in allogeneic graft than syngeneic controls 5 days after transplantation ($p<0.001$). Immunohistochemistry of liver allograft showed PD-L1^{+} cells in the portal area and the PD-1^{+} CD4^{+} T cells, PD-1^{+} CD8^{+} T cells infiltrated around the area. Anti-PD-1 mAb canceled the induction of allogeneic graft spontaneous acceptance ($P=0.0265$) (Figure.1).
Conclusions : Our data suggested that PD-L1 expressed in portal area after allogeneic liver transplant and which suppress the allo-effector T cell response though the PD1, subsequently induce spontaneous liver allograft tolerance.

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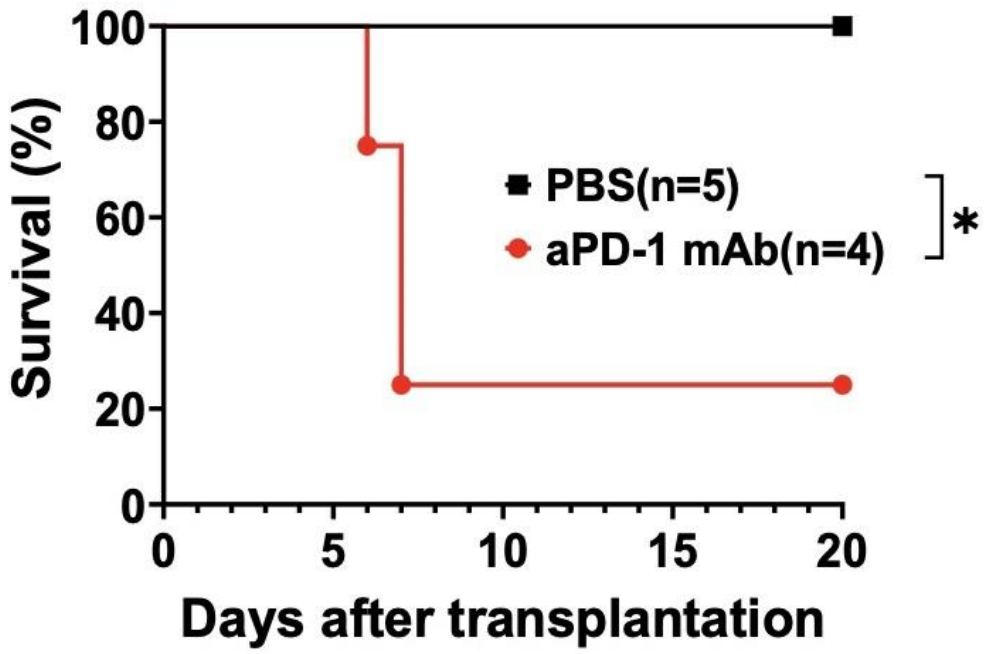
【Figure.1】


100
80
60
40
20
0
Survival (%)
0
5
10
15
20
Days after transplantation
PBS(n=5)
aPD-1 mAb(n=4)
*

Abstract Submission No.: OP-0470

Innate immune cell responses cause the shorter survival of recipient in genetically-engineering pig to no-human primate orthotopic liver xenotransplantation

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Objectives : Liver xenotransplantation with genetically-engineering pig donor is a potential solution to the worldwide liver donor shortage. To date, the survival of NHP recipients of liver xenotransplantation is generally short, and the causes and mechanisms need to be further studied.
Methods : In 9 cases of genetically-engineering pig to NHP orthotopic liver xenotransplantation, clinical and immunological indicators of recipients were detected and the pathological examination of the graft tissue was performed by IHC at different time points. The single-cell RNA sequencing technology was used to analyze the immune cell grouping and activation in PBMCs as well as graft tissues of three NHP models with longer recipients survival.
Results : The survival of recipients with GTKO/CMAHKO/β4GalN2KO/hCD55/hTBM donors was 5、5、3days respectively, while the survival of other recipients with GTKO donors was no more than 2 days. The coagulation function and platelet count of three longer suvival recipients was basically normal in the first 3 days after operaiton, and then slightly decreased. Severe coagulation disorder and thrombocytopenia after operation were observed in other recipients. T/B cells remained at a low level, and there were no increase in IgM and IgG in PBMC of all recipients. The grafts in shorter survival recipients had large areas necrosis and a large number of RBCs destroyed inside. While the grafts in longer survival recipients showed small focal necrosis in the liver lobules, and a few T cells infiltration, antibodys and complements deposition. However, when the two recipients with 5 days survival died, the number of macrophages (LYZ+CD14) and NK cells (PRF1+GNLY+) in the grafts increased significantly and were activated.
Conclusions : Multi-gene modified pig as donor can alleviate profound coagulopathy and thrombocytopenia of recipient in the early stage after operation. Innate immune cells responses in the graft may cause the shorter survival of recipients.

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 1
(Kidney / Pancreas)

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0376

Diagnostic Yield of Kidney Disease Gene Panel Testing During Kidney Transplant Evaluation

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Objectives : Approximately 15% of patients with end-stage kidney disease (ESKD) do not have a primary renal disease diagnosis. Monogenic diseases are estimated to account for 10-15% of the overall prevalence of ESKD in adults. Since knowledge of the underlying kidney disease is crucial for ESKD management in the context of transplantation (KT), we conducted genetic testing using massively parallel sequencing (MPS) to access the diagnostic yield in patients on the KT waitlist.
Methods : A total of 161 patients, waitlisted for KT between January 2023 and July 2024 in a single transplant center, underwent MPS kidney disease gene panel testing, containing 282 genes. We classified the variants according to the classification of the American College of Medical Genetics and Genomics.
Results : Out of the 161 patients on the KT waitlist, 46.6% of patients (n=75) did not have a definite renal diagnosis, while 53.4% (n=86) had a known etiology of ESKD after a thorough clinical evaluation. Patients with a known etiology were subcategorized by their primary causes as hereditary (n=9, all of whom had autosomal dominant polycystic kidney disease) or non-hereditary (n=77). Among the 152 genetically analyzed patients with non-hereditary or without a definite renal diagnosis, 9.2% (n=14) were found to carry pathogenic or likely pathogenic variants. Of these 14 patients, 35.7% (n=5) were found to carry COL4 mutations. In another 62.5% (n=96), we identified variants of unknown significance (VUS). Among them, one patient had a CFH mutation and was diagnosed with atypical hemolytic uremic syndrome after KT. As a result, MPS gene panel testing increased the proportion of hereditary cases from 5.6% to 14.9%.
Conclusions : MPS gene panel testing has benefits for defining precise renal diagnoses and unraveling the etiology of ESKD.

Abstract Submission No.: OP-0214

Protocolised Pre-transplant Abdominal CT Screening Is Useful In Evaluation Of High-risk Kidney Transplant Waitlist Candidates

Sharel Zi Hui Ong, Jia Qin Tan, Chin Yee Lee, Ho Yan Wong, Ian Tatt Liew, Quan Yao Ho, Sobhana Thangaraju, Yi Shern Terence Kee, Valerie Huei Li Gan, Lay Guat Ng
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Objectives : Aortoiliac calcification and peripheral vascular disease is common amongst dialysis patients and portends worse post-transplant outcomes. Pre-transplant abdominal computed tomography (CT) has been a proposed screening strategy. Additionally, CT screening allows concurrent surgical planning (e.g. evaluating space-occupying polycystic kidneys) and malignancy screening. However, the utility of protocolized CT screening of waitlisted patients is unclear.
Methods : This was a retrospective review of kidney transplant (KT) waitlist candidates of a tertiary transplant center who underwent screening abdominal CT scan between March 2018 to August 2023. High-risk patients (defined as age≥50 years old, diabetic, uncontrolled mineral-bone disease, re-transplants or polycystic kidney disease) underwent protocolized abdominal CT screening at time of waitlist evaluation. CT scans were reviewed by transplant urologists to advise on follow-up actions - i.e. rejected from waitlist, protocolized 2-yearly screening abdominal ultrasonography, or higher-intensity screening/intervention.
Results : Screening abdominal CT scans were performed for 303 patients. 6 patients (2.0%) were rejected from waitlist due to severe aortoiliac calcification and/or peripheral vascular disease. No abnormalities were detected in 183 patients (60.4%) who then underwent protocolized 2-yearly screening abdominal ultrasonography. 114 patients (37.6%) had abnormal results necessitating intervention or higher-intensity screening [Table 1]. 80 patients (26.4%) had significant aortoiliac calcification, 29 patients (9.6%) had suspicious lesions, 14 patients (4.6%) had polycystic kidney disease [Table 2]. Multivariable analysis demonstrated increased odds of significant aortoiliac calcification amongst diabetics and those with longer dialysis vintage [Table 3]. Risks of rejection from waitlist was 14.3 (95% confidence interval 1.64 - 124.2, p=0.02) in diabetics compared to non-diabetics. Risks of detecting a suspicious kidney lesion on CT was 1.09 (95% confidence interval 1.01-1.17, p=0.03) for each increment of 1 year of age.
Conclusions : Amongst high-risk patients on waitlist, protocolised screening abdominal CT detected significant proportion with aortoiliac calcification and/or radiologically suspicious lesions. Pre-transplant screening abdominal CT should be considered in high-risk patients.

Table.png

Table 1. Outcomes of screening abdominal CT scans of waitlisted KT candidates

Outcomes	**Number of patients (N= 303)**	**Percentage (%)**
Rejected for severe aortoiliac calcification and/or peripheral vascular disease	6	2.0
No abnormalities detected	183	60.4
Required higher-intensity screening / intervention - Biopsy - Alternative imaging - Serial CT/ultrasonography - Additional CT in 6 years	114	30.6

Table 2. Abnormalities detected on screening abdominal CT requiring higher-intensity screening / intervention

Radiological abnormalities	**Number of CT scans, n (%)** (n = 114)
Aortoiliac calcification	80 (70.2)
Radiologically suspicious lesions	29 (25.4)
Polycystic kidney disease	14 (12.3)

*9 CT scans had >1 radiological abnormality detected

Table 3. Multivariable analysis for aortoiliac calcifications and/or peripheral vascular disease detected on screening abdominal CT scan

Risk	Odds	95% Confidence interval	P Value
Diabetics	7.01	3.91 - 12.6	<0.001
Dialysis vintage	1.10	1.04 - 1.17	0.002

Abstract Submission No.: OP-0305

Prevalence and Risk Factors of Frailty in Long-Term Kidney Transplant Recipients: A Prospective Study

Young Jin Yoo[1], Minyu Kang[1], Hawhee Koh[1], Seung Hyuk Yim[1], Mun Chae Choi[1], Hyun Jeong Kim[1], Namki Hong[2], Yumie Rhee[2], Kyu Ha Huh[1], Juhan Lee[1]
[1]Department of Surgery, Division of Transplant Surgery, Yonsei University College of Medicine, Korea, Republic of
[2]Department of Endocrinology and Metabolism, Yonsei University College of Medicine, Korea, Republic of

Case Study : Frailty is prevalent among kidney transplant candidates and has been associated with unfavorable outcomes. Although some studies have shown an initial improvement in frailty shortly after transplantation, there is limited study on frailty prevalence and risk factors in patients with long-term post-transplantation follow-up. This prospective study aimed to investigate the prevalence of frailty and its associated risk factors in long-term kidney transplant recipients at Severance Hospital from November 2022 to July 2023. Frailty was assessed using the Fried phenotype score, and individuals with a score of 2 or higher were classified as frail. The study included 487 patients, with a median age of 60 years (IQR, 55-65 years). Among them, 52.2% were male. The median post-transplantation follow-up was 91 months (IQR, 50-155 months). Glucocorticoids were maintained in 93.8% of patients, and 97.3% received tacrolimus as maintenance immunosuppressive agent. The overall prevalence of frailty among all patients was 13.8% (67/487). The prevalence of frailty in males and females was 12.6% and 15.0%, respectively. Within 1-5 years, 5-10 years, and over 10 years post-transplantation, the frailty prevalence was 10.9%, 10.7%, and 18.3%, respectively. Multivariate analysis identified several factors associated with a higher frailty risk, including low body mass index and longer time after transplant. Conversely, higher serum total protein and hemoglobin levels, as well as increased physical activity, were associated with a potential lower frailty risk. This study suggests that adequate nutritional support and exercise may help mitigate frailty risk in long-term kidney transplant recipients.

Abstract Submission No.: OP-0136

Optimization of a model for predicting renal function after living kidney transplantation using CT volumetry

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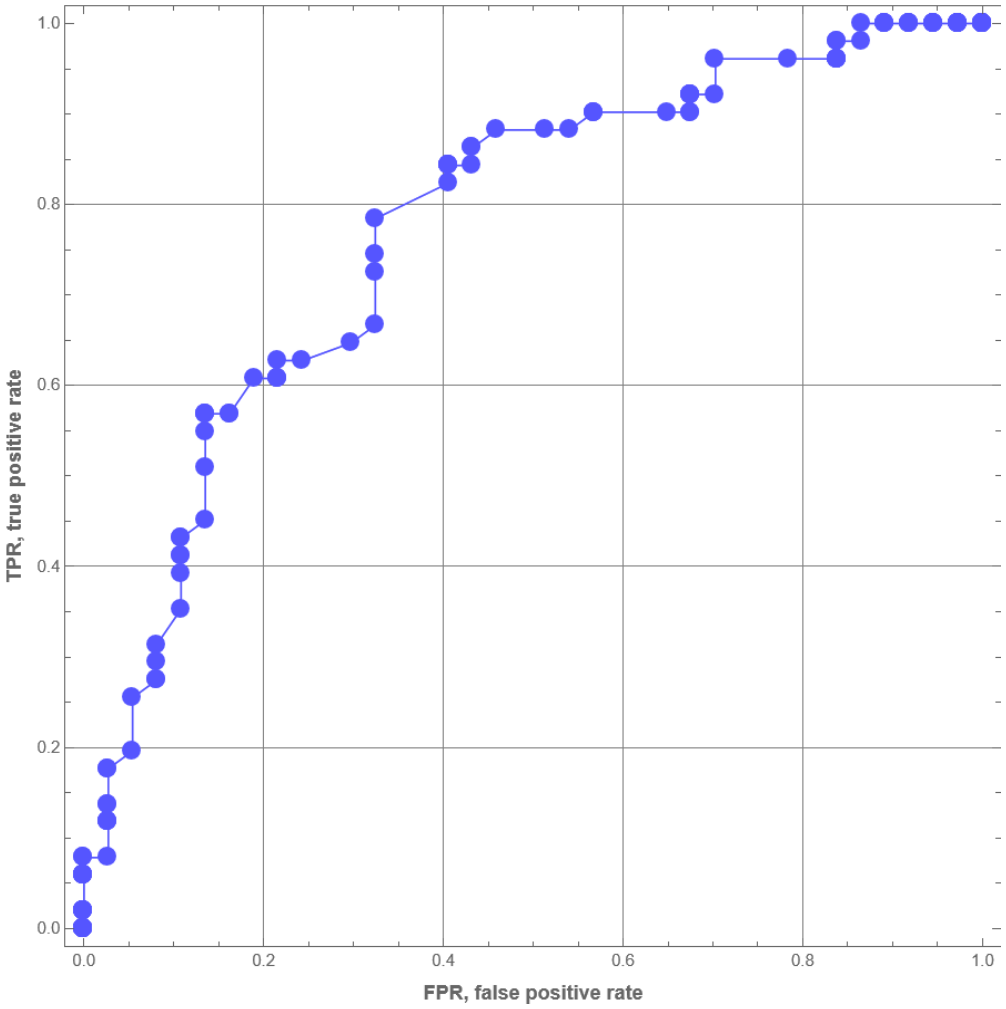
[1]Department of Urology, Tokyo Women's Medical University, Japan
[2]Department of Transplant Surgery, Mita Hospital International University of Health and Welfare, Japan
[3]Department of Radiological Services, Tokyo Women's Medical University, Japan
[4]Department of Organ Transplant Medicine, Tokyo Women's Medical University, Japan

Objectives : The Living Kidney Donor Profile Index (LKDPI) was developed to calculate the risk score for recipients of living kidney transplantation using clinical data including height and weight of donor and recipient. However, post operative kidney function varied among the cases; more personal information should be incorporated into the prediction model. In this study, we investigated whether the prediction accuracy of postoperative kidney function could be improved by including data on donor kidney volume, recipient visceral fat, and skeletal muscle mass, which were calculated from CT volumetry (CTv).
Methods : 294 living kidney transplants performed at Tokyo Women's Medical University between 2012 and 2016 were randomly divided into 7:3 training data and test data. By using 32 clinical data including CTv of donor excised kidney and that of recipient internal fat and of skeletal muscle volumes, we generated the model with Symbolic Regression for predicting postoperative kidney function. Since it has been reported that the patient with eGFR<45 ml/min/1.73 m2 revealed poorer long-term graft survival, we implemented eGFR of ≥45 ml/min/1.73 m2 at 14 days after the transplant as an objective variable to be predicted.
Results : From the 1106 generated models, 110 optimal models were mechanically isolated not to include over- and unlearned models. We ensembled those models to generate one predictive equation using the bagging method. In the validation using test data, the accuracy, precision, and AUC of ROC was 68.18%, 78.05%, and 0.7732, respectively, which is superior to the model that was generated without CTv data. The clinical variables judged to have the strongest influence on predicting kidney function were donor CTv, donor age, hemodialysis duration, recipient weight, recipient visceral fat mass (L3 level), and number of HLA-DR mismatches.
Conclusions : Preoperative CTv data may improve the prediction model for early kidney allograft function by taking individual body figure information into consideration.

Figure.png


1.0
0.8
0.6
0.4
0.2
0.0
TPR, true positive rate
0.0
0.2
0.4
0.6
0.8
1.0
FPR, false positive rate

Abstract Submission No.: OP-0181

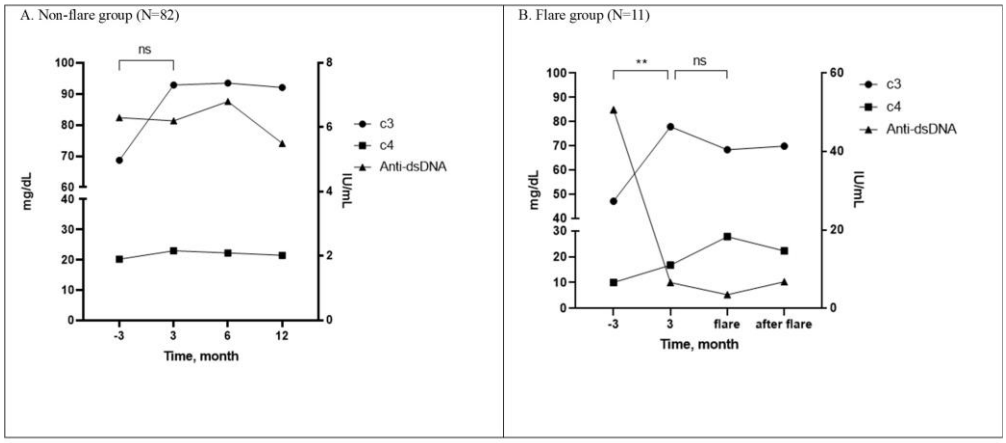
A Comparative Analysis of Kidney Transplantation Outcomes in Systemic Lupus Erythematosus Patients with Disease Flare vs. Non-Flare Groups

JIN-MYUNG KIM[1], Young-Eun Kim, Hye Eun Kwon[1], Youngmin Ko[1], Joo Hee Jung[1], Hyunwook Kwon[1], Young Hoon Kim[1], Seok-chan Hong, Sung Shin[1]
[1]Department of Kidney and Pancreas Transplantation, Asan Medical Center, Korea, Republic of
[2]Department of Internal Medicine, Asan Medical Center, Korea, Republic of

Objectives : Kidney transplantation (KT) has become a promising treatment for end-stage renal disease (ESRD) in lupus nephritis (LN) patients, reducing mortality. However, KT in LN patients carries risks of post-transplant complications, including rejection, infections, and lupus flare. This study assessed the incidence and clinical manifestations of lupus flare, particularly recurrent lupus nephritis, in kidney transplant recipients with a history of LN, and identified potential risk factors for flare.
Methods : A retrospective analysis was conducted on 93 systemic lupus erythematosus (SLE) patients who received kidney transplants at Asan Medical Center between January 1995 and December 2021. Patients were divided into flare (N=11) and non-flare (N=82) groups. Clinical data, including demographics, flare characteristics, immunosuppression regimens, patient survival, death-censored graft survival (DCGS), and biopsy-proven acute rejection (BPAR)-free survival rates were analyzed.
Results : In the flare group, elevated anti-dsDNA levels were observed both before (100.3 vs. 6.3 IU/mL) and after (29.2 vs. 6.2 IU/mL) transplantation compared to the non-flare group, with significant decreases post-surgery in both groups. Flares occurred at a median of 8.0 months post-transplant, with biopsy-proven lupus nephritis and hematologic manifestations each occurring in 36.3% of patients. The median anti-dsDNA level during flare was 3.5 IU/mL, and eGFR was 26.0. Pre-transplant anti-dsDNA level was a predictive factor for flare (HR 1.030; 95% CI, 1.008–1.053; P = 0.008). Estimated 20-year survival was 83.3% for the flare group and 94.7% for the non-flare group (P=0.577), with no significant difference in DCGS rates (P=0.435).
Conclusions : Anti-dsDNA level predicts flare in SLE patients post-KT, with flares typically occurring within the first year and potentially leading to lupus nephritis recurrence. Despite flares, patient and graft survival rates were not significantly affected. Further research is needed to optimize flare management in these patients.

Lupus_figure.jpg

Figure 1. Changes in laboratory data before and after kidney transplantation



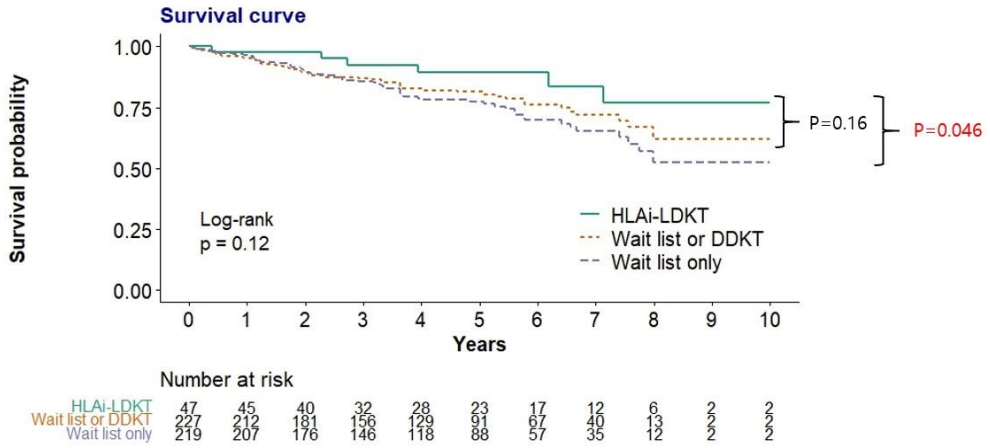
Abstract Submission No.: OP-0219

Survival benefit of HLA-incompatible living donor kidney transplantation compared to waiting deceased donor kidney transplantation in elderly patients

HWA-HEE KOH[1], Minyu Kang[1], Young Jin Yoo[1], Hyun Jeong Kim[1], Juhan Lee[1], Myoung Soo Kim[1], Beom Seok Kim[2], Jaeseok Yang[2], Kyu Ha Huh[1]
[1]Department of Surgery, Division of Transplant Surgery, Severance Hospital, Korea, Republic of
[2]Department of Internal Medicine, Severance Hospital, Korea, Republic of

Objectives : HLA-incompatible living donor kidney transplantation (HLAi-LDKT) in elderly patients is challenging issue due to risk of complications associated with pretransplant desensitization and heavy immunosuppression. This study evaluates survival benefit of HLAi-LDKT compared to waiting DDKT in elderly patients to determine the optimal strategy.
Methods : We analyzed 758 patients who registered for KT at their 60 or older in Korean single center. For elderly HLAi-LDKT, outcomes were compared according to HLA antibody strength. To investigate survival benefit, patients who received HLAi-LDKT was 1:5 matched with controls who remained on the waiting list or received DDKT (Waitlist-or-DDKT group), and with those who remained on the waiting list without receiving a transplant (Waitlist-only group).
Results : The 57 HLAi-LDKT group consisted of positive complement-dependent cytotoxicity (CDC) crossmatch (CDC+FC+) (n=12), positive flow cytometric crossmatch (CDC-FC+) (n=30), pretransplant donor-specific antibody only (CDC-FC-DSA+) (n=15). Desensitization protocol targeting DSA consisted of plasmapheresis, intravenous immunoglobulin, and rituximab with/without bortezomib. The number of preoperative plasmapheresis differed significantly among these groups (7.8±2.3, 4.3±1.6, 3.4±2.1, $p<0.001$). The 5-year graft survival rates were similar (91.7% for CDC+FC+ vs. 88.1% for CDC-FC+ vs. 91.7% for CDC-FC-DSA+, $p=0.921$) although biopsy-proven rejection was numerically higher in CDC+FC+ and CDC-FC+ than that of CDC-FC-DSA+ (38.1% vs. 30.0% vs. 13.3%, $P=0.461$). Among matched population, the 10-year patient survival rate was 76.7% for HLAi-LDKT, compared to 62.1% for the Waitlist-or-DDKT group, and 52.6% for the Waitlist-only group, with a statistically significant difference between HLAi-LDKT and the Waitlist-only group ($p=0.046$).
Conclusions : In patients aged 60 and older, HLAi-LDKT offers survival benefit compared to remaining on the waitlist. HLAi-LDKT with potent desensitization could be a viable option in the elderly patients.

whole survival.jpg


Survival curve
Survival probability
1.00
0.75
0.50
0.25
0.00
Log-rank
p = 0.12
HLAi-LDKT
Wait list or DDKT
Wait list only
P=0.16
P=0.046
0
1
2
3
4
5
6
7
8
9
10
Years
Number at risk
HLAi-LDKT 47 45 40 32 28 23 17 12 6 2 2
Wait list or DDKT 227 212 181 156 129 91 67 40 13 2 2
Wait list only 219 207 176 146 118 88 57 35 12 2 2

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 2
(Liver)

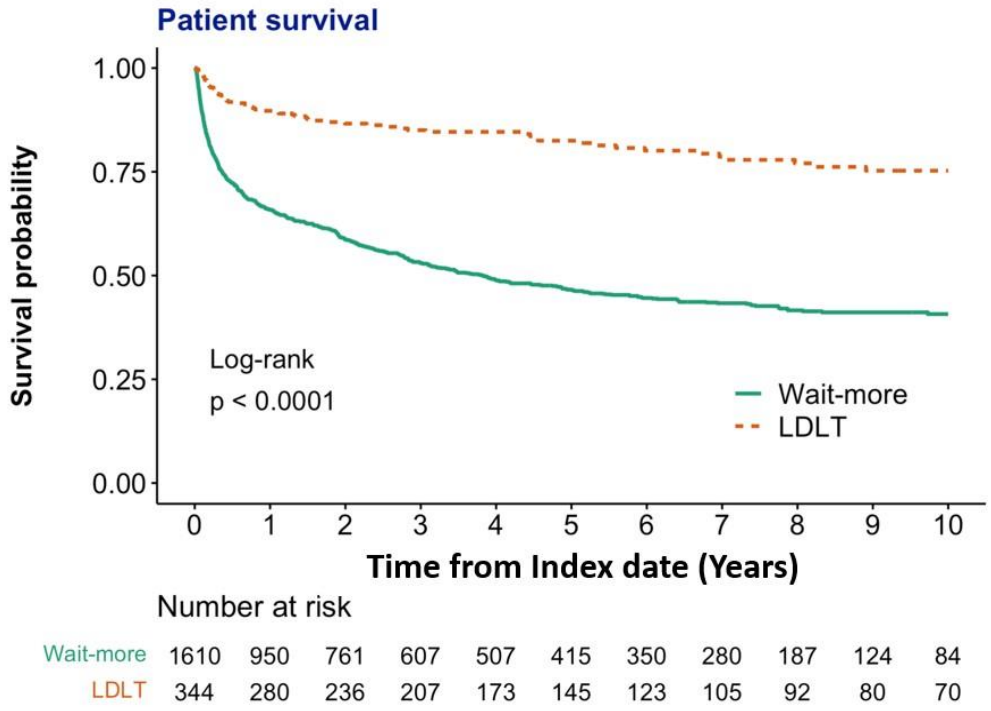
Abstract Submission No.: OP-0419

Survival benefits in living-donor liver transplantation: a nested case-control analysis based on the MELD score trajectories from the waitlist.

Seung Hyuk Yim, Deok-Gie Kim, Eun-Ki Min, Jae Geun Lee, Dong Jin Joo, Myoung Soo Kim
Department of Surgery, Division of Transplant Surgery, Yonsei University College of Medicine, Korea, Republic of

Objectives : The suitability of living-donor liver transplantation (LDLT) for patients with different MELD scores has been a subject of considerable debate. While earlier studies indicated benefits of LDLT predominantly for patients with MELD scores under 15, recent findings suggest LDLT has survival benefits in MELD-Na scores of 11 or greater. Therefore, we aimed to assess the survival advantage of LDLT over waiting for deceased-donor liver in a comprehensive range of MELD scores.
Methods : This study encompassed patients on the liver transplantation waitlist at a single center from June 2005 to December 2021. Patients under 18 and those with malignancies, including hepatocellular carcinoma, were excluded. A nested case-control analysis with a 1:4 match was implemented, comparing LDLT recipients with MELD trajectory controls (n=25,735). Overall survival rates were compared between the LDLT group and the Wait-more group, with additional sub-group analyses for various MELD score categories.
Results : From 1954 cases, 344 were LDLT recipients and 1610 were in the Wait-more group. Both groups had similar baseline characteristics, except for admission duration, within 3 months (6.0 days in LDLT vs. 4.0 Wait-more, P=0.023). In Kaplan-Meier survival analysis, the LDLT group demonstrated significantly higher survival rates (1-year, 89.3% vs. 65.1%; 5-year, 82.2% vs. 46.7%; p<0.001). Sub-group analysis by different MELD score category showed the LDLT group consistently demonstrating improved survival over the Wait-more group, notable even in the MELD 6-10 (1-year, 95.8% vs. 86.8%; 5-year, 87.4% vs. 60.4%, P=0.017) and extending to MELD scores of 36 or higher (1-year, 74.8% vs. 21.9%; 5-year, 65.7% vs. 20.0%; P<0.001).
Conclusions : LDLT offers a survival benefit across a broad spectrum of MELD scores, highlighting its potential wider applicability in LT.

figure1.jpg



Number at risk

Wait-more	1610	950	761	607	507	415	350	280	187	124	84
LDLT	344	280	236	207	173	145	123	105	92	80	70

Abstract Submission No.: OP-0050

Recipient and Donor SIRPa Genotypic Variant Combination Modulates Immune Response after Living Donor Liver Transplantation

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Objectives : The SIRPa-CD47 axis is a self-tolerance mechanism through the "don't eat me signal" by myeloid cells. Recently, the impact of SIRPa polymorphism has been reported to modulate APC activation in a mice model. Herein we confirmed human SIRPa V2 has a higher binding capacity to CD47 and a costimulatory effect on T cells. We demonstrated the SIRPa genotype's impact on recipients' immune response after liver transplantation (LT).
Methods : We obtained genomic DNA from peripheral-blood and sequenced the SIRPa IgV domain, which binds to CD47, by Sanger sequencing and NGS methods. We analyzed the CD14+ monocytes SIRPa V1 and V2 binding affinity to CD47 by flow cytometry-based assay. The direct effect of recombinant SIRPa V1 and V2 (rV1/rV2) on T-cells was accessed in a T-cell proliferation assay. Eighty-five recipients and donor pairs who underwent living donor LT were enrolled in this study to investigate the impact of SIRPa polymorphism on clinical outcomes.
Results : SIRPa genotype we categorized into three haplotypes (V1/V1, V1/V2, and V2/V2). We observed greater binding capacity of V2 SIRPα compared to V1. We found rV2 SIRPa enhanced the proliferation of CD4+ T-cells compared to rV1 under polyclonal stimulation. We defined a potential allo-response model of antigen presentation considering the mechanistic contribution of recipient and donor APC activation by bidirectional SIRPa-CD47 interaction and T-cell activation by SIRPa-inducing signal. The sum of donor and recipient APC presentations graded from 4+ to 8+. We observed significantly lower acute rejection incidence in low response pairs (4+ and 5+) compared to intermediate (6+) and high (7+ and 8+) (0/13(0%) vs 27/72(37.5%), p=0.001). Focusing on response against non-allogeneic antigens, we observed the incidence of blood-stream infection was stratified by the magnitude of presentation defined by the SIRPa genotype.
Conclusions : Our findings indicate that recipient and donor SIRPa genotypes have an impact on immune response after liver transplantation.

Abstract Submission No.: OP-0018

Predicting Futile Outcomes Following Deceased Donor Liver Transplantation in Patients With MELD-Na Score Above 30: A Retrospective International Multicenter Cohort Study

Hye-Sung Jo[1], Young-In Yoon[2], Ki-Hun Kim[2], Parissa Tabrizian[3], Wellington Andraus[4], Jongman Kim[5], Deok-Gie Kim[6], Carlos Florez-Zorrilla[7], Karim J Halazun[8], Dong-Sik Kim[1]
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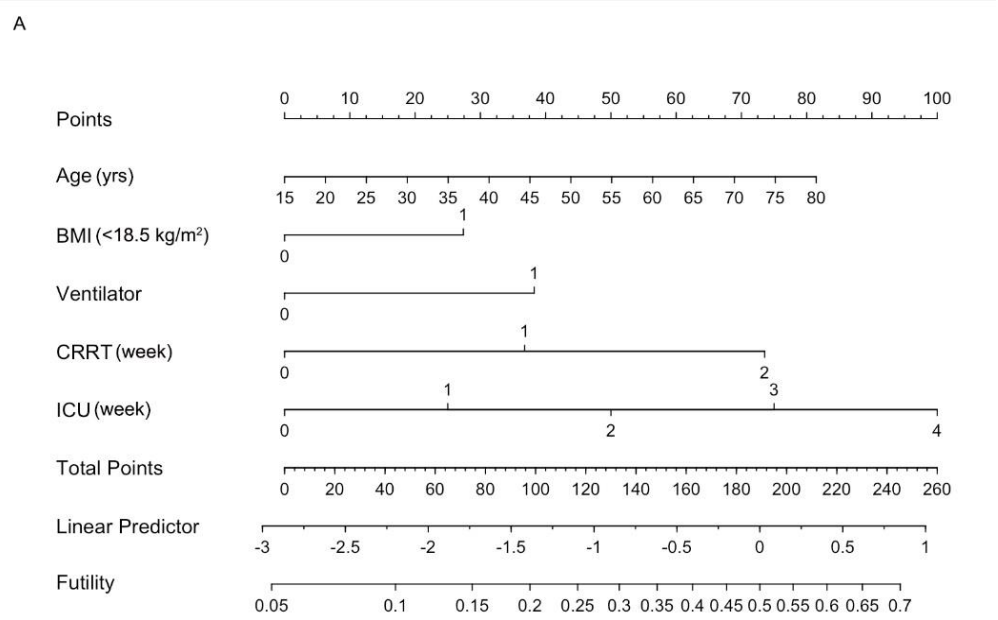
[7]Department of HPB and Liver Transplant, Centro Medico Nacional 20 de Noviembre, Mexico
[8]Department of NYU Langone Health, Transplantation, United States

Objectives : In the current "sickest first" allocation policy for limited deceased liver grafts, identifying patients "too sick to transplant" before transplantation is crucial to optimize outcomes. This study aimed to predict futile outcomes following deceased donor liver transplantation (DDLT) in patients with Model for End-Stage Liver Disease-Sodium (MELD-Na) scores ≥30.
Methods : This international multicenter study was conducted as part of the International Society of Liver Surgeons. We collected data from patients with a MELD-Na score ≥30 who underwent DDLT. A total of 994 patients were enrolled between 2010–2021, including 654 from the Republic of Korea, 224 from the US, and 116 from other regions. Futility was defined as death within three months or during the hospital stay following a DDLT. After exclusion, 160 (16.6%) patients were classified into a futile group and 803 (83.4%) into a non-futile group.
Results : The MELD-Na scores collected at three time points (listing, matching, and transplantation) were comparable between the groups (P=0.442, P=0.180, and P=0.554, respectively). Regarding concomitant organ failure factors, the futile group showed a higher incidence of organ dysfunction across all measured parameters, including the use of mechanical ventilators, continuous renal replacement therapy (CRRT), pneumonia, bacteremia, and vasopressor use (all P<0.01). Independent risk factors for futile outcome were recipient age (≥65 years), body mass index (<18.5 kg/m^2), mechanical ventilator use, CRRT (≥1 week), and prolonged ICU stay before transplantation (≥2 weeks). The futility rate was 53.3% in patients with ≥3 risk factors (P<0.001). We developed a nomogram to predict futility after DDLT based on multivariate regression analysis, which showed a better predictive power than previous models.

Conclusions : The risk factors and new nomogram, which adequately reflect concomitant organ failure before liver transplantation, could effectively predict the risk of futile outcomes after DDLT and contribute to decision-making regarding transplantation eligibility in clinical practice.

Nomogram.jpg



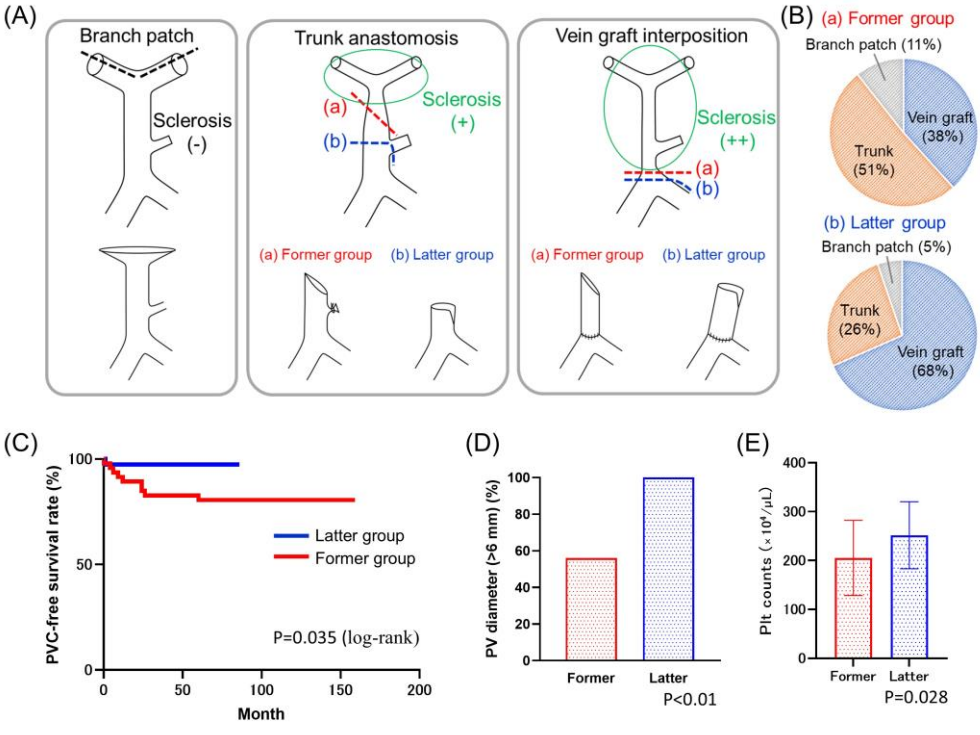
Abstract Submission No.: OP-0125

Impact of New Portal Reconstruction Strategy on Portal Vein Growth and Outcomes in Living-Donor Liver Transplantation for Small Children with Biliary Atresia

Hikaru Aoki[1], Takashi Ito[1], Eri Ogawa[1], Miki Yamamoto[1], Elena Uebayashi[1], Shinya Okumura[1], Yuki Masano[1], Tatsuya Okamoto[1], Hideaki Okajima[2], Etsuro Hatano[1]
[1]Department of Surgery, Kyoto University, Japan
[2]Department of Pediatric Surgery, Kanazawa Medical University, Japan

Objectives : Portal vein (PV) complications in living-donor liver transplantation exhibit a particularly high incidence in small children with biliary atresia. However, the criteria for optimal anastomosis methods have yet to be clarified. Furthermore, few studies have focused on optimal reconstruction methods that emphasize PV growth. Thus, we aimed to identify the optimal method for PV reconstruction in small children with biliary atresia.
Methods : Data from 85 patients with biliary atresia aged <3 years who underwent living-donor liver transplantation at Kyoto University Hospital from January 2011 to December 2022 were retrospectively reviewed. We have employed three types of PV reconstruction; branch patch, trunk anastomosis, and vein graft interposition (Figure 1A). Patients were categorized into the former ("before 2017") and latter ("after 2017") groups when a new reconstruction method involving aggressive resection of the sclerotic PV, larger anastomotic orifice, and proactive vein graft interposition was adopted (Figure 1A).
Results : The former and latter groups comprised 47 and 38 patients, respectively. The patient characteristics were similar and did not differ significantly between the groups. Reconstruction methods differed significantly (P=0.021); the percentage of trunk reconstruction cases decreased from 51% (24/47) to 26% (10/38), whereas that of vein graft interposition increased from 38% (18/47) to 68% (26/38) (Figure 1B). PV complication rates improved significantly from 19% (9/47) to 3% (1/38) (P=0.035) (Figure 1C). Over 6 months postoperatively, the minimum PV diameter was >6 mm in only 56% of cases in the former group but improved to 100% in the latter group (P<0.01) (Figure 1D). Platelet counts at 1 year postoperatively were significantly higher in the latter group (P=0.028) (Figure 1E).
Conclusions : In living-donor liver transplantation for small children with biliary atresia, aggressive resection of the sclerotic PV, large anastomotic orifice, and proactive vein graft interposition may reduce PV complications and provide appropriate portal dilation for body growth.

ATW.Figure.jpg


(A)
Branch patch
Sclerosis
(-)
Trunk anastomosis
(a)
(b)
Sclerosis
(+)
(a) Former group
(b) Latter group
Vein graft interposition
Sclerosis
(++)
(a)
(b)
(a) Former group
(b) Latter group
(B)
(a) Former group
Branch patch (11%)
Vein graft
(38%)
Trunk
(51%)
(b) Latter group
Branch patch (5%)
Trunk
(26%)
Vein graft
(68%)

(C)
PVC-free survival rate (%)
100
50
0
0
50
100
150
200
Month
Latter group
Former group
P=0.035 (log-rank)

(D)
PV diameter (>6 mm) (%)
100
80
60
40
20
0
Former
Latter
P<0.01

(E)
Plt counts (×10⁴/μL)
400
300
200
100
0
Former
Latter
P=0.028

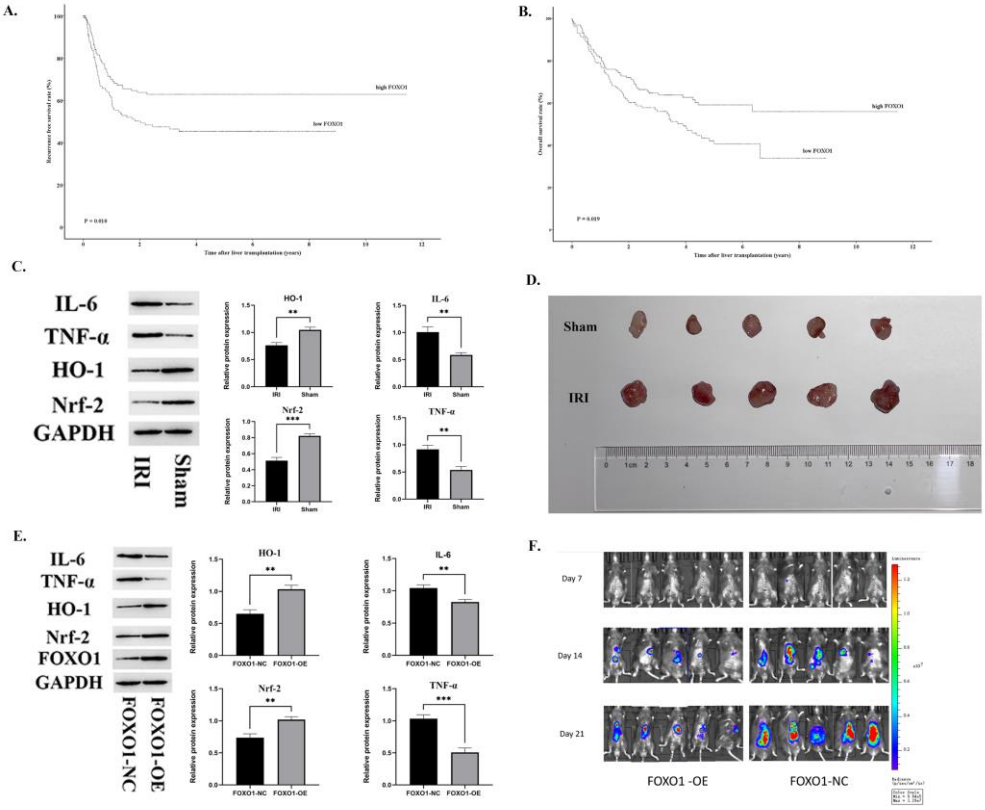
Abstract Submission No.: OP-0345

The Role of FOXO1 in Post-Transplant Recurrence of Hepatocellular Carcinoma: A Study on Diagnostic and Therapeutic Targets

Chao Wang
Department of Surgery, Division of Transplant Surgery, zhejiang university, China

Objectives : Hepatocellular carcinoma (HCC) is a highly prevalent and deadly malignancy in China. Although liver transplantation is the most effective treatment for HCC, tumor recurrence remains a significant challenge. Identifying precise diagnostic and therapeutic targets for post-transplant recurrence is crucial for improving HCC outcomes. This study aims to investigate the clinical association between FOXO1 and liver transplant outcomes in HCC patients and to explore the therapeutic potential of an esterase-responsive cationic liposome-coated nanocomplex targeting the liver in animal models.
Methods : We analyzed a tissue microarray of liver transplant samples from HCC patients (n = 259) to elucidate the correlation between FOXO1 expression and clinical parameters. We then constructed an esterase-responsive cationic liposome-coated nanocomplex carrying FOXO1, targeting the liver, and evaluated its effects in vivo on tumor recurrence post-transplant.
Results : Analysis of the liver transplant tissue microarray revealed that recipients with low FOXO1 expression had significantly shorter tumor-free survival (P = 0.010) and overall survival (P = 0.019) compared to those with high FOXO1 expression. Animal experiments showed that hepatic ischemia-reperfusion injury (IRI) induced changes in key inflammatory (TNF-α and IL-6) and oxidative stress proteins (Nrf-2 and HO-1), promoting tumor growth. Treatment with the liver-targeted FOXO1 esterase-responsive cationic liposome-coated nanocomplex significantly reduced tumor size in mice post-IRI compared to controls. Additionally, alanine aminotransferase and aspartate aminotransferase levels and liver histology (HE staining) indicated reduced IRI in treated mice. The nanocomplex treatment also decreased inflammatory protein expression and increased oxidative stress protein expression in the liver.
Conclusions : Low FOXO1 expression is a risk factor for post-transplant recurrence of HCC. FOXO1 can inhibit HCC progression by mitigating oxidative stress and inflammatory responses induced by hepatic IRI, providing a new strategy for the diagnosis and treatment of tumor recurrence after liver transplantation in HCC patients.

摘要.jpg


A.
high FOXO1
low FOXO1
P = 0.010
Time after liver transplantation (years)
B.
high FOXO1
low FOXO1
P = 0.019
Time after liver transplantation (years)
C.
IL-6
TNF-α
HO-1
Nrf-2
GAPDH
IRI
Sham
HO-1
IL-6
Nrf-2
TNF-α
Relative protein expression
D.
Sham
IRI
E.
IL-6
TNF-α
HO-1
Nrf-2
FOXO1
GAPDH
FOXO1-NC
FOXO1-OE
HO-1
IL-6
Nrf-2
TNF-α
Relative protein expression
F.
Day 7
Day 14
Day 21
FOXO1 -OE
FOXO1-NC

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 3
(Liver)

Abstract Submission No.: OP-0454

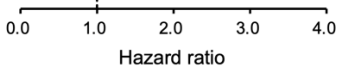
Outcomes and Key Determinants in Living Donor Liver Transplants from Elderly Donors: A Multicenter Cohort Analyses

Eun-Ki Min, Deok-Gie Kim, Jae Geun Lee
Department of Surgery, Division of Transplant Surgery, Severance Hospital, Korea, Republic of

Objectives : Ensuring graft survival with aged liver grafts remains a critical challenge in living donor liver transplantation (LDLT). Previous studies on living donor age and recipient survival have shown mixed results, with specific considerations in elderly donor LDLT still underexplored.
Methods : A total of 4,035 LDLT cases from a multicenter cohort were included. The cut-off for an old age donor was determined using a smoothing spline curve. Graft survival between the Old-donor and Young-donor groups was compared after 1:3 propensity score matching. We investigated risk factors for graft loss in Old-donor LDLT versus Young-donor LDLT across various subgroups using interaction analyses, with outcomes stratified according to the number of risk factors present.
Results : The study population was divided into the Old-donor group (n=374, 9.3%) and the Young-donor group (n=3,661; 90.7%) with a cut-off age of 50 years for donors. In the propensity-matched cohort, the Old-donor group showed a significantly lower 5-year graft survival rate than the Young-donor group (79.6% vs. 87.7%, P=0.004). Old-donor status was an independent risk factor for graft loss in the entire population, with an adjusted hazard ratio of 1.56 (95% CI: 1.17–2.07, P=0.002). Three risk factors exhibited significant interactions with Old-donor LDLT: cold ischemic time ≥ 150 minutes, Model for End-stage Liver Disease score ≥ 20, and recipient body mass index ≥ 25 kg/m^2. When accompanied by two or more risk factors, Old-donor LDLT resulted in a higher risk of graft loss compared to Young-donor LDLT (HR 3.78, 95% CI: 1.97–7.26, P<0.001). There was no difference in 6-month donor complications between old and young donors (P=0.672)
Conclusions : Graft survival after LDLT was compromised in cases involving old donors (≥50 years), particularly when two or more risk factors for graft loss were present. Short-term donor outcomes were not significantly associated with donor age.

Old donor LDLT Figure 3..png

Subgroups	Case number (Old / Young)	5yr graft survival (Old / Young)	HR (95% CI)	P	Interaction P
Total	374 / 3661	79.6% / 87.9%	1.68 (1.16-2.43)	0.006	
Recipient age <55	207 / 2122	86.2% / 89.1%	1.25 (0.77-2.03)	0.130	
Recipient age ≥55	167 / 1539	73.1% / 86.9%	1.70 (1.19-2.43)	0.005	0.267
Male recipient	262 / 2625	79.4% / 87.9%	1.52 (1.08-2.13)	0.015	
Female recipient	112 / 1036	80.1% / 87.8%	1.60 (0.94-2.74)	0.086	0.996
Recipient BMI <25	247 / 2277	80.7% / 86.5%	1.28 (0.89-1.84)	0.188	
Recipient BMI ≥25	**127 / 1422**	**77.8% / 90.2%**	**2.20 (1.37-3.52)**	**0.001**	**0.081**
Alcoholic	85 / 920	76.4% / 87.7%	1.76 (1.02-3.03)	0.042	
Not alcoholic	289 / 2741	80.7% / 88.0%	1.44 (1.03-2.01)	0.034	0.371
HCC	211 / 2006	76.6% / 85.9%	1.41 (0.97-2.04)	0.068	
No HCC	163 / 1655	83.3% / 90.2%	1.67 (1.06-2.63)	0.026	0.580
MELD <20	300 / 2909	81.0% / 88.4%	1.41 (1.00-1.98)	0.051	
MELD ≥20	**74 / 752**	**73.2% / 86.0%**	**2.24 (1.33-3.77)**	**0.002**	**0.099**
Male donor	130 / 2420	78.2% / 88.2%	1.73 (1.09-2.76)	0.021	
Female donor	244 / 1241	80.2% / 87.3%	1.30 (0.89-1.92)	0.177	0.367
Donor BMI <23	145/ 1634	82.4% / 87.1%	1.37 (0.86-2.18)	0.182	
Donor BMI ≥23	229 / 2027	77.7% / 88.6%	1.61 (1.11-2.32)	0.012	0.598
GRWR ≥0.8	318 / 3309	80.4% / 88.3%	1.56 (1.14-2.13)	0.006	
GRWR <0.8	56 / 352	74.1% / 84.3%	1.49 (0.73-3.07)	0.277	0.801
CIT <150	314 / 3261	82.2% / 88.4%	1.34 (0.96-1.87)	0.086	
CIT ≥150	**60 / 400**	**65.0% / 83.9%**	**2.80 (1.52-5.16)**	**<0.001**	**0.046**



Abstract Submission No.: NP-0062

Clinical usefulness of digital single-operator cholangioscopy for post-liver transplant anastomotic stricture: SPYPASS-2 study

Woo Hyun Paik[1], In Rae Cho[1], Sang Hyub Lee[1], Suk Kyun Hong[2], Young Rok Choi[2], Nam-Joon Yi[2], Kwang-Woong Lee[2], Kyung-Suk Suh[2]
[1]Department of Gastroenterology, Seoul National University Hospital, Korea, Republic of
[2]Department of Surgery, Seoul National University Hospital, Korea, Republic of

Objectives : Liver transplantation (LT) is a definite treatment for end-stage liver disease. Anastomotic biliary strictures (ABS) are more common in living donor LT (LDLT). However, the success rate of endoscopic retrograde cholangiopancreatography (ERCP) for ABS remains unsatisfactory. This study aimed to evaluate the efficacy of single-operator cholangioscopy (SOC)-facilitated treatment for ABS in LDLT recipients.
Methods : This prospective study included 40 LDLT patients undergoing ERCP with SOC (SpyGlass™ DS II) to treat ABS between October 2021 and May 2023. When the guidewire placement across the ABS was difficult during the conventional ERCP procedure (cannulation time >10 min), SOC was introduced. Our primary endpoint was technical success defined as successful guidewire placement across the ABS and/or subsequent treatment. The secondary endpoints were rates of clinical success, complication, and re-intervention.
Results : The mean patient age was 59.7 (±7.2) years, and the median time from LDLT to the occurrence of ABS was 156 days (interquartile range: 71-212). Technical and clinical successes were achieved in 92.5% (37/40) and 78.4% (33/40) of patients, respectively. The rates of post-ERCP cholangitis, pancreatitis, and bleeding were 10.0%, 15.0%, and 2.5%, respectively. Intestinal perforation did not occur, and all adverse events were mild in severity. Early stent migration within one month occurred in two (5.4%) patients, and four (10.8%) patients required re-intervention within 1 month.
Conclusions : This study shows the efficacy and safety of SOC-facilitated management for ABS. SOC is expected to play a significant role in the treatment of ABS in LDLT patients.

Abstract Submission No.: OP-0402

Perioperative Subcutaneous Adipose Tissue Radiodensity Impacts Outcomes of Liver Transplantation for Hepatocellular Carcinoma: A Multicenter Retrospective Study

Zhihang Hu[1], Xiao Xu[2], Di Lu[2]
[1]Department of Liver Transplantation and Hepatobiliary Surgery, Zhejiang University School of Medicine, China
[2]Department of Department of General Surgery, Hangzhou Medical College, China

Objectives : The prognostic value of skeletal muscle in liver transplant candidates with hepatocellular carcinoma (HCC) has been documented; however, the role of adipose tissue remains ambiguous. This study aimed to evaluate the association between adipose tissue and transplant outcomes in patients with HCC.
Methods : A total of 765 patients with HCC who underwent liver transplantation (LT) at 3 transplant centers were included in this retrospective study. Computed tomography (CT) scans were utilized to quantify the area and radiodensity of visceral and subcutaneous adipose tissue. Cut-off values for adipose tissue parameters were determined based on tertiles. The Cox proportional hazards models were established to identify the predictors of overall survival (OS) and tumor recurrence.
Results : Median age at transplant was 53 years, most were male (89.0%) and cirrhotic (91.7%). The median follow-up was 40.3 months. In univariate survival analysis, patients with high subcutaneous adipose tissue radiodensity (SATr) (> -86.5 HU) exhibited significantly lower 5-year OS rates than those with low SATr (49.9% vs. 65.3%, P < 0.001). Adjusted analyses revealed that high SATr independently predicted increased mortality (HR, 1.498; 95% CI, 1.175-1.909; P = 0.001). SATr significantly increased during the first month postoperatively (P < 0.001), with one-third of the patients exhibiting an SATr change rate exceeding 10%. An increase in SATr > 10% was independently associated with poorer OS (HR, 1.549; 95% CI, 1.095-2.190; P = 0.013) and higher recurrence risk (HR, 1.776; 95% CI, 1.242-2.540; P = 0.002).
Conclusions : Higher preoperative SATr was an independent predictor of patient mortality after LT for HCC. Postoperatively, a SATr increase > 10% during the first month was independently associated with elevated risk of mortality and tumor recurrence.

Abstract Submission No.: OP-0212

Immune Checkpoint Inhibitor - Risk Factors for Rejection after Liver Transplantation: A Multi-center, Retrospective Cohort Study

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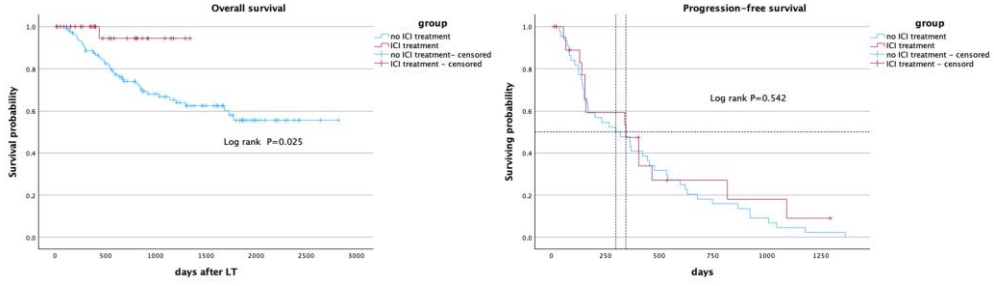
Case Study : We performed a retrospective cohort study on hepatocellular carcinoma (HCC) patients receiving liver transplant at multi-center in China from Jan 1st 2015 to March 1st 2024, with data cutoff at April 22nd, 2024. The primary objectives were to compare the rejection-free survival between patients with and without ICIs treatment. Univariate and multivariable cox analysis was performed to search for risk factors for rejection in patients with ICIs treatment. By analyzing immunohistochemistry staining, we further explored the mechanism of ICIs-related rejection.145 patients were included after propensity score matching. The mean age is 53.62±9.277 years, 98.6% of the patients were male. In non-ICI treated group, 63(58.9%), 37(34.6%), and 7(6.5%) patients were categorized into Child A, B and C, while 24(63.2%), 12(31.6%), and 2(5.3%) in ICI treated group. There were 8(7.5%), 36(33.6%), 36(33.6%), 20(18.7%), and 7(6.5%) patients with BCLC stage 0, A, B and C in non-ICI treated group, 1(2.6%), 9(23.7%), 16(42.1%), 10(26.3%), and 2(5.3%) in ICI-treated group, respectively. Patients conducting ICIs experienced a significantly higher rejection rate (23.7%) than patients who did not(P<0.001). Overall survival (OS) was significantly improved in ICI-treated group (1905.639 vs 1292.667 days, Log rank P=0.025). Patients achieving partial response (PR) were 9.740 times as likely to experience rejection compared to those who achieved progressive disease (PD) or stable disease (SD) (95% CI 2.492-38.074). Every extra day between the last ICI use and LT reduces the rejection probability by 1.7% (OR 0.983, 95%CI 0.967-0.998). $CD8^+$T cell infiltration in tumor margin appears to be the mechanism of ICI-related rejection. Our study suggests that tumor response to ICIs treatment and interval between the last ICI use and transplant may be potential risk factors for rejection after liver transplantation. It is essential to appropriately adjust the immunosuppression regimen and monitor ICI-related rejection considering the commonly pre-operative usage of ICIs in HCC setting.

Figure 1.jpg



Abstract Submission No.: OP-0377

Immunosuppressive Medication Non-adherence in Liver Transplant Recipients in VietNam

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Objectives : In Vietnam, the number of patients undergoing liver transplants is increasing. Transplant recipients are expected to adhere to a lifelong immunosuppressive therapeutic regimen. Non-adherence to immunosuppressive medication is a risk factor for poor post-transplant outcomes. This study aims to describe common characteristics and assess non-adherence to immunosuppressive therapy among patients post-liver transplantation.
Methods : This descriptive cross-sectional study involved 106 liver transplant patients from April to June 2024 at the Hepato-Biliary and Pancreatic Department of 108 Military Central Hospital. Non-adherence to immunosuppressive therapy was evaluated using the BAASIS questionnaire for liver graft recipients. Patient characteristics and adherence data were collected through medical records and face-to-face interviews.
Results : The average time between liver transplantation and administration of the questionnaire was 25.7 ± 17.4 months. The median age of the patients was 53.3 ± 11 years, and 83% were male. 98.1% of patients received their liver transplant from a living donor, while 24.5% had emergency transplants. According to BAASIS results, 12.3% of patients were non-adherent to their immunosuppressive regimen. Non-adherence, as assessed by BAASIS, was significantly associated with transplant indication, medical staff encouragement, and satisfaction with immunosuppressive drug use ($p < 0.05$).
Conclusions : Liver transplantation remains the preferred treatment option for end-stage liver disease. The BAASIS questionnaire indicates a low level of non-adherence among liver transplant patients at 108 Military Central Hospital. This suggests that liver transplant surgery is a safe and effective initial treatment for patients with end-stage liver disease, provided that patients adhere to their treatment regimen.

Patient-characteristics.jpg

Patient characteristics		Adherence n(%)	Non-adherence n(%)	p
Age	≤40	13(92,9)	1(7,1)	0,297
	41-60	52(88,1)	7(11,9)	
	>60	28(84,8)	5(15,2)	
Indications	Cancer	38(86,4)	6(13,6)	0,027
	Cirrhosis	27(79,4)	7(20,6)	
	Liver failure	28(100)	0(0)	
Receive results and encouragement from medical staff	No	21(75)	7(25)	0,038
	Yes	72(92,3)	6(7,7)	
Satisfaction with medication use	No	3(75)	1(25)	0,001
	Yes	90(88,2)	12(11,8)	
Health improvement	No	6(85,7)	1(14,3)	0,407
	Yes	87(87,9)	12(12,1)	

Abstract Submission No.: OP-0163

Safety and Efficacy of Tacrolimus Granules in Chinese Pediatric Liver Transplant Recipients: Insights from Two Phase IV Multicenter Studies

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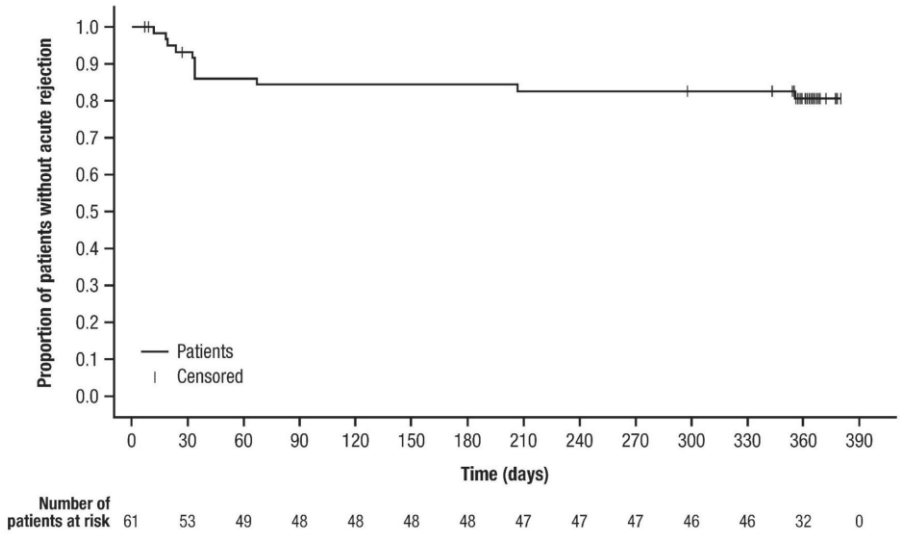
Objectives : An evaluation of the safety and efficacy of immunosuppression regimens containing tacrolimus granules (Modigraf®, MOD) in Asian pediatric liver transplant (LTx) recipients is greatly needed. To address this, we conducted two open-label, multicenter, single arm, phase IV studies.
Methods : Between December 2021 and March 2023, pediatric recipients of de novo allograft LTx were prospectively enrolled from Chinese centers to receive MOD for 12 months. Initial tacrolimus dose was 0.2 mg/kg/day or 0.15–0.3 mg/kg/day orally; subsequent doses were adjusted by the investigator based on clinical evidence of efficacy, adverse event occurrence, and tacrolimus whole blood trough level (recommended range: 5–15 ng/mL). Incidence of acute rejection (biopsy-proven or clinically suspected), graft and patient survival rates, dose adjustments, tacrolimus trough levels, and treatment-emergent adverse events (TEAEs) were evaluated.
Results : Of the 61 pediatric LTx recipients who enrolled and received MOD, approximately half (50.8%, 31/61) were female and most (77.0%, 47/61) were ≤6 years old. Most (91.8%, 56/61) received an organ from a living donor. The two most common indications for LTx were cholestatic liver disease (72.1%, 44/61) and genetic metabolic disease (19.7%, 12/61). The mean (SD) tacrolimus dose was 0.149 (0.074) mg/kg/day and the mean (SD) number of dose adjustments was 9.8 (5.2). Mean (SD) tacrolimus whole blood trough level was 6.70 (1.85) ng/mL. Eleven patients (18.0%) experienced ≥1 acute rejection episode, of which 7 were biopsy-proven (Figure). One patient (1.6%) had graft failure and died due to acute liver failure. Incidence of drug-related TEAEs was 77.0% (47/61). No new safety issues were identified.
Conclusions : In Chinese pediatric LTx patients receiving MOD, incidence of acute rejection and graft failure within 12 months was numerically lower than previously reported studies. Findings support use of MOD in pediatric LT recipients.

Figure 1.png

Figure. Kaplan–Meier plot of time to acute rejection in pediatric LTx recipients



LTx, liver transplant

Day 0 was the date of reperfusion

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 4
(Kidney / Pancreas)

Abstract Submission No.: PP-0278

Discovering the mechanism of tacrolimus induced pancreatic beta cell injury by using single RNAseq analysis

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Objectives : Tacrolimus is an important immunosuppression agent following kidney transplantation which frequently causes the development of diabetes mellitus. In this study, we investigated the transcriptomic changes of pancreatic β cells exposed under tacrolimus in a single cell resolution.
Methods : Sprague-Dawley rats (n=3 per each group) were randomly assigned to normal control group and tacrolimus treatment group. Tacrolimus was administered subcutaneously at doses of 1.5mg/kg/day. After 2 weeks of tacrolimus treatment, pancreatic islets were isolated form both groups. These isolated islets were dissociated into a single cell level, and libraries were prepared using the 10X Chromium library v3.1 kit, targeting approximately 8,000 cells from each group. The prepared libraries were sequenced by using Hiseq X Ten.
Results : The relative proportion of β cells was decreased while α cells was increased in tacrolimus treated islets. However, we did not observe any changes in the expression of β cell de-differentiation markers, including mature β cell genes (Ins1, Ins2, Ucn3, MafA, and Slc2a2) or progenitor genes (Ngn3 and Sox9). Notably, endoplasmic reticulum (ER) stress genes (Fkbp11, Ddit3, Atf3, and Atf5), along with senescence genes (Igf1r and Bambi), were upregulated in the tacrolimus-treated β cells. Furthermore, genes involved in de novo cholesterol biosynthesis (Hmgcs1 and Hmgcr) were also upregulated in tacrolimus-treated β cells, suggesting a potential novel mechanism behind tacrolimus-induced β cell injury.
Conclusions : In conclusion, tacrolimus administration results in a decrease in the number of β cells, accompanied by an increase in ER stress and cellular senescence. The present study suggests the involvement of the cholesterol biosynthesis pathway in the adaptation of β cell islets to tacrolimus, highlighting a potential novel mechanism of tacrolimus-induced β cell injury.

Abstract Submission No.: OP-0160

The Impact of SARS-CoV-2 Vaccination on the Incidence of Early Allograft Rejection in Kidney Transplant Recipients

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Objectives : Vaccination reduces the infection-related comorbidities and improves overall survival for immune-compromised patients during the SARS-CoV-2 pandemic. Evidences from cross-section studies confirm the safety and efficacy of SARS-CoV-2 vaccination in chronic kidney disease (CKD) patients and kidney transplant recipients (KTR), and is strongly recommended. Nonetheless, KTRs are at higher risk of allograft rejection in the early post-transplant period (EPTP), and the impact of vaccine-induced immune response in this period should be further investigated.
Methods : Between Jan. 2016 and May 2024, KTRs at Taipei Veterans General Hospital were enrolled (n=282). These patients were divided into high immune risk (PRA>20%, or blood type incompatible KTRs, n=90) and normal immune risk (PRA<20% and blood type compatible KTRs, n=192). To further investigate the impact of SARS-CoA-2 vaccine in the EPTP, these patients were divided into 3 groups based on their vaccination status (Group A: without vaccination before KT, Group B: latest vaccination > 3 months before KT, Group C: latest vaccination<= 3 months before KT). The incidence of biopsy-proven acute rejection (BPAR) in the EPTP (within 3 months post-transplant) was compared between these groups.
Results : Overall, there were 35 cases of BPAR in this study cohort (35/282, 12.4%), The incidence was significantly higher in the high immune risk (17/90, 18.9%) than the normal immune risk (18/192, 9.4%) patients (p=0.032). In the normal immune risk patients, the incidence of BPAR in Group C was higher than Group B &A (Group A/B/C: 7.6%/8.9%/22.2%, p=0.105). It's worth noting that normal immune risk Group C patients could reach high incidence of BPAR (22.2%) as seen in the high immune risk patients (18.9%, p=0.537).
Conclusions : SARS-CoV-2 vaccination within 3 months prior to KT can be associated with higher risk of BPAR within 3 months after KT in the traditionally normal immune risk KTRs.

Abstract Submission No.: OP-0074

Triglyceride-Glucose Index And Risk Of Cardiovascular Events, Renal Allograft Loss, And New Onset Diabetes After Transplantation In Renal Transplant Recipients

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Objectives : Insulin resistance is prevalent disorder, but its clinical significance remains undermined. We explored the clinical implication of triglyceride-glucose (TyG) index in renal transplant recipients, recognizing it as a valuable marker for insulin resistance.
Methods : A total of 6,354 renal transplant recipients were enrolled from a nationwide, prospective cohort between May 2014 and December 2022. The TyG index was assessed between 6- and 12-months post-transplantation. We evaluated the association between TyG index and the risk of composite of cardiovascular events and death, renal allograft loss, and new onset diabetes after transplantation (NODAT).
Results : During the mean follow-up period of 39.2 ± 26.1 months, a total of 106 composite events of cardiovascular events and death, 174 events of renal allograft loss, and 438 events of NODAT were observed. The cumulative rate for composite events, graft loss, and NODAT was greater in patients with higher TyG quartile (all $P < 0.001$). In multivariate analysis, patients in quartile 4 TyG index was associated with an increased risk of composite events (HR 1.81, 95% CI 1.14 – 2.86), renal allograft loss (HR 2.13, 95% CI 1.28 – 3.55), and NODAT (HR 2.52, 95% CI 1.90 – 3.34). Higher quartile of TyG was associated with future graft dysfunction (adjusted mean eGFR differences of -4.72, 95% CI -7.39 – -2.04). There was a linear escalation in the risk of composite events and graft loss with the incremental rise in the TyG index, concomitant with an exponential augmentation in the risk of NODAT.
Conclusions : Renal transplant recipients with higher TyG index are associated with higher risk of composite of cardiovascular event and death, renal allograft loss, and NODAT.

Table_01.jpg

Abstract Submission No.: OP-0146

Successful Kidney Transplantations from Cyanide-Poisoned Donors: The Only Two Documented Cases in Korea

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Case Study : In the era of organ donor shortages, marginal donors are increasingly used. This report examines kidney transplants from cyanide-poisoned donors treated with hydroxocobalamin, assessing the impact of blood toxin levels and antidotal treatments on organ suitability for transplantation. Case 1: A 54-year-old male ingested potassium cyanide and was hospitalized after cardiopulmonary resuscitation. Blood cyanide levels decreased from 1.5 mg/L to 0.1 mg/L over five days. Despite stable kidney function and adequate urine output, he was declared brain dead on the seventh day. His kidney was transplanted into a 27-year-old male recipient with negative PRA I and II. The kidney, weighing 235 g with a cold ischemic time of 65 minutes, exhibited no delayed graft function (DGF) or complications. The recipient's blood creatinine levels were stable: 1.18 mg/dL at discharge, and 1.12 mg/dL, 1.35 mg/dL, and 1.30 mg/dL at one month, six months, and one year, respectively. At three years, creatinine was stable at 1.31 mg/dL with no signs of rejection or complications. Case 2: A 67-year-old male who ingested cyanide received hydroxocobalamin and was transported to the emergency room five hours later. Due to unavailable toxicological testing, the transplantation decision was based on cyanide's half-life data. Surgery was delayed until 66 hours post-ingestion, considering the maximum reported half-life. Despite cherry-colored urine, kidney function remained stable. His kidneys were transplanted into a 60-year-old female and a 50-year-old male, both of whom had stable renal function with no DGF or complications. Creatinine levels were approximately 0.8 mg/dL and 0.99 mg/dL, respectively, during follow-up. These cases demonstrate that successful kidney transplantation from cyanide-poisoned donors is possible even in the absence of cyanide blood testing, with appropriate antidote therapy, careful monitoring of renal function, and timing of surgery to account for the half-life of cyanide.

Abstract Submission No.: OP-0319

Protective effect of combined use of liraglutide and empagliflozin on Tacrolimus-induced diabetes mellitus and nephrotoxicity in a rat model

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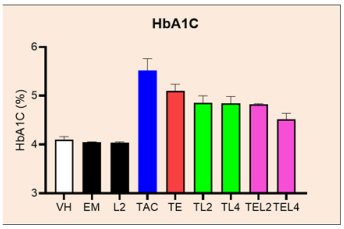
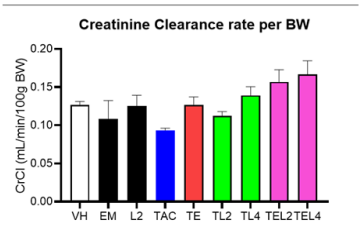
Objectives : Glucagon-like peptide-1 receptor agonists (GLP-1RA) and sodium-glucose co-transporter-2 inhibitors (SGLT2i) are important newer anti-diabetic drugs in the treatment of type II diabetes mellitus (DM). However, their use in tacrolimus (TAC)-induced DM remains undetermined. The aim of this study is to evaluate the protective effect of the combined use of liraglutide (GLP-1RA) and empagliflozin (SGLT2i) on the TAC-induced pancreatic and kidney injuries.
Methods : Sprague-Dawley (SD) rats were divided into six groups, each consisting of six rats, and were treated with a low-salt diet along with tacrolimus (1.5 mg/kg/day, administered subcutaneously) for 5 weeks. In addition to tacrolimus, liraglutide (0.2 mg/kg/day or 0.4 mg/kg/day, administered subcutaneously every 12 hours), empagliflozin (10 mg/kg/day, administered via oral gavage), or a combination of both were administered for 5 weeks to evaluate their potential protective effects. The effects of liraglutide and empagliflozin were assessed by measuring HbA1c levels, creatinine clearance rates, and markers of oxidative stress and apoptosis. Additionally, morphological changes in the kidneys and pancreas were observed.
Results : In the experimental SD rat model of TAC-induced DM and nephrotoxicity, combined use of GLP-1RA and SGLT2i significantly decreased blood glucose level, HbA1C and increased pancreatic islet size. In the kidneys, this combination therapy improved renal function, as evidenced by enhanced creatinine clearance, and reduced interstitial fibrosis and profibrotic cytokines. Additionally, the increased oxidative stress induced by TAC was markedly reduced in serum, pancreatic, and renal tissues with the administration of GLP-1RA or SGLT2i.
Conclusions : Combined use of GLP-1RA and SGLT2i showed protective effect on TAC-induced DM and nephrotoxicity.

FIG.png

	VH	TAC	TAC+EM	TAC+LL	TAC+HL	TAC+EM+LL	TAC+EM+HL
BW (g)	401 ± 25	343 ± 9[a]	349 ± 11[a]	336 ± 2[a]	339 ± 5[a]	351 ± 10[a]	318 ± 4[a]
△BW (g)	197 ± 21	145 ± 7[a]	152 ± 10[a]	138 ± 5[a]	134 ± 4[a]	144 ± 10[a]	119 ± 3[a]
UV (ml/day)	16.5 ± 4.2	43.0 ± 11	41.2 ± 7.5	23.5 ± 6.5	26.3 ±4.8	32.5 ± 12.8	41.3 ± 7.1
CrCl (mL/min/100g BW)	0.13 ± 0.004	0.09 ± 0.003[a]	0.13 ± 0.01	0.11 ± 0.01	0.14 ± 0.01[b]	0.16 ± 0.02[b]	0.17 ± 0.02[abd]
Urinary glucose (mL/day/100g BW)	0 ± 0	182 ± 178[a]	413 ± 85[a]	213 ± 71[a]	306 ± 128[a]	741 ± 285[a]	754 ± 118[a]
HbA1C (%)	4.10 ± 0.06	5.52 ± 0.24[a]	5.10 ± 0.14[a]	4.85 ±0.15	4.84 ± 0.14[ab]	4.92 ± 0.10	4.60 ± 0.13[b]
AST (U/L)	121 ± 8	199 ± 4[a]	182 ± 23	177 ± 12	160 ± 5	106 ± 9[b,c,d]	101 ± 5[b,c,d,e]
TAC conc. (ng/mL	0.48 ± 0.21	0.50 ± 0.17	0.30 ± 0.10	0.57 ± 0.11	0.50 ± 0.10	0.75 ± 0.05	0.48 ± 0.21





Abstract Submission No.: OP-0159

De Novo Use of Tacrolimus Granules in Pediatric Kidney Transplant Recipients: Integrated Safety and Efficacy Results from Two Multicenter Open-Label Studies in China

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Objectives : Data on the use of tacrolimus granules for immunosuppression in Asian pediatric patients are limited. We conducted two open-label, multicenter, single-arm, phase IV studies in China to assess safety and efficacy of tacrolimus granules (Modigraf®, MOD) in pediatric patients after kidney transplant (KTx).

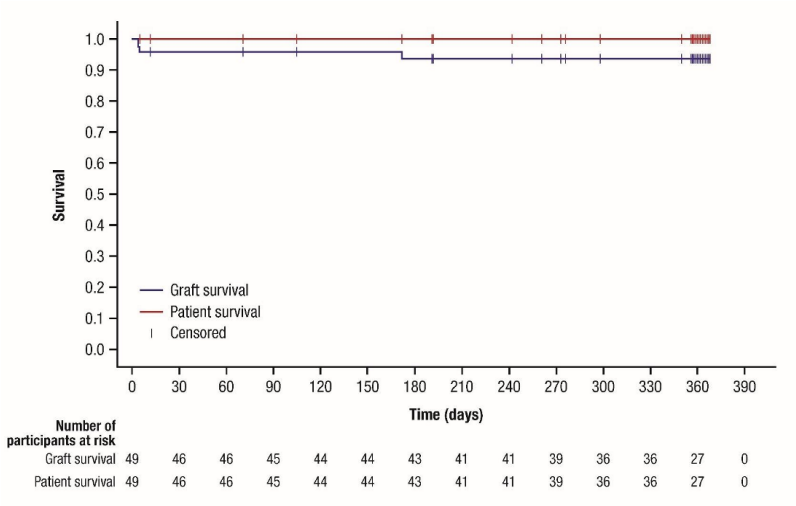
Methods : Patients aged <18 years who underwent de novo allograft KTx in participating centers in China were prospectively enrolled between December 2021 and March 2023 to receive MOD for 12 months. Initial tacrolimus dose was 0.2 mg/kg/day or 0.15–0.3 mg/kg/day orally; subsequent doses were adjusted by the investigator based on clinical evidence of efficacy, occurrence of adverse events, and tacrolimus whole blood trough level (recommended range: 5–15 ng/mL). Both studies evaluated MOD based on incidence of acute rejection (biopsy-proven or clinically suspected), graft and patient survival rates, dose adjustments, tacrolimus trough levels, and incidence of treatment-emergent adverse events (TEAEs).

Results : Across both studies, 50 patients were enrolled and 49 received treatment. Most (71.4%, 35/49) patients were male and the median (range) age was 13 (2–17) years. Almost all (95.9%, 47/49) received an organ from deceased donor. Mean (SD) tacrolimus dose was 0.170 (0.111) mg/kg/day; mean (SD) number of dose adjustments was 13.5 (5.3). Mean (SD) tacrolimus whole blood trough level was 8.19 (1.33) ng/mL. Incidence of acute rejection was 4.1% (2/49 patients; 95% CI: 0.5–14.0%), while graft and patient survival rates were 93.9% (46/49) and 98.0% (48/49), respectively (Figure 1). Incidence of drug-related TEAEs was 73.5% (36/49); 10.2% (5/49) patients reported drug-related TEAEs leading to treatment withdrawal. No new safety issues were identified

Conclusions : MOD had an acceptable tolerability profile when used within recommended trough levels in pediatric KTx recipients for ≤12 months. Incidence of acute rejection and graft loss was numerically lower than historical data in this population.

Figure 1.png

Figure 1: Kaplan–Meier plot of time to graft dysfunction and death among pediatric KTx recipients receiving tacrolimus granules



KTx, kidney transplant.

Day 0 was the date of reperfusion. One patient died after the end of treatment and is marked as censored on the patient survival curve.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 5
(Basic)

Abstract Submission No.: OP-0115

Molecular Mechanisms Of Immune Tolerance For Anti-Host And Anti-Donor T Cells In Mixed Chimeras

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Case Study : COH-MC-17 regimen for induction of mixed chimerism consists of radiation-free non-myeloablative conditioning with low-dose cyclophosphamide, pentostatin, and ATG, as well as infusion of donor-type $CD4^+$ T-depleted hematopoietic cells containing donor $CD8^+$ and $CD4^-CD8^-$ T (double negative T, DNT) cells. COH-MC-17 regime has been under phase I clinical trials with sickle cell patients (NCT03249831) and severe aplastic anemia patients (NCT05757310). The regimen has successfully established an immunosuppressant-free long-term stable haploidentical mixed chimerism in a patient (unpublished data). Our preclinical studies showed that donor T cells in transplants were required for induction of mixed chimerism (MC) and host-type $Foxp3^+CD4^+$ Treg cells were required for organ transplantation immune tolerance in MHC-mismatched MC (Huang et al: AJT2023), however, the mechanisms remained unclear. Here, with flow cytometry and combined scRNA-Seq with TCR-CDR3-Seq analysis, we analyzed donor- and host-type T cells in the draining lymph nodes of MC with skin graft. Donor $CD8^+$ T and DNT cells showed clonal expansion and anergy/exhaustion. By analyzing host-type Treg subsets and clonotypes from WT-MC, $MHCII^{-/-}$-MC, and mice given conditioning alone, we identified combination markers (Helios, NRP-1, CTLA4, IL-2Ra, and Tigit as well as TCF1, BACH2, IRF4, Blimp1, and IGFBP) for distinguishing thymic-derived tTreg and periphery-derived pTreg cells. We also identified donor MHCII-dependent and host MHCII-dependent pTreg development pathways from anergic/exhausted $CD4^+$ T cells, and the MHCII-dependent pathway was associated with enhanced mTORC1 signaling. Therefore, in the MHC-mismatched MC established with COH-MC-17 regimen, absence of donor $CD4^+$ T cells in the transplant allows anti-host donor-type $CD8^+$ T and DNT to facilitate engraftment without causing GVHD; on the other hand, anti-donor MHCII host-type Tcon cells can differentiate from anergy/exhaustion to pTreg cells to augment organ transplant tolerance in a donor-type MHCII-dependent manner.

Abstract Submission No.: OP-0283

Graft-infiltrating Regulatory T Cells contribute maintenance transplant Tolerance

Kyohei Kuriyama, Kodai Morimoto, Gong Yu, Masaki Harada, Kyoko Yogo, Yui Maehara, Saori Hirota, Kazuyoshi Takeda, Koichiro Uchida
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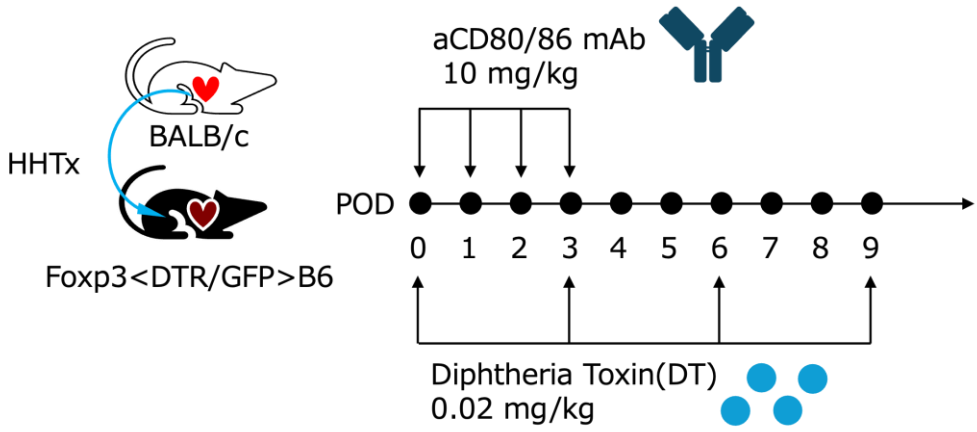
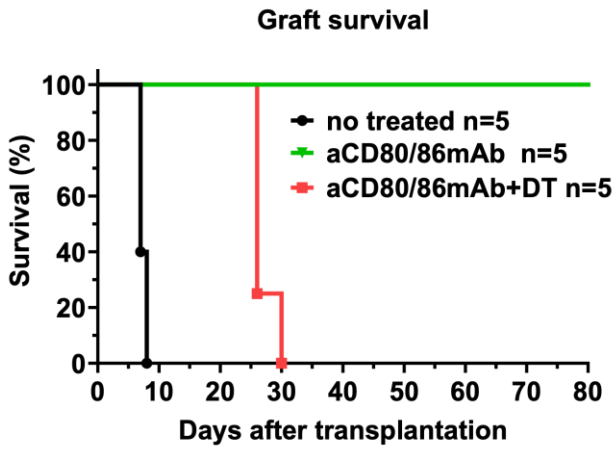
Objectives : There are various report to investigate the mechanism to maintain transplant tolerance systemically such as Treg suppression, infecitous tolerance or clonal deletion/anaergy. Here we investigate the local Treg in the graft contributes to the tolerance.
Methods : Cardiac allotransplant were performed heterotopically into the abdominal space from BALB/c to B6 mice. A second graft transplant was subsequently performed in the cervical region. Heart grafts, lymph nodes, and spleens from the transplanted mice were harvested, and lymphocytes were isolated. Tregs were enriched via cell sorting, and gene expression levels were quantified using qPCR.
Results : Allograft tolerance were induced by the 4 doses administration of aCD80/86 mAbs and the tolerance were maintained without any dose of the mAbs. The maintenance were canceled by Treg depleted condition. The tolerance mice accepted the second graft from the same donor not from the 3rd party donor without any treatment, however the 2nd graft rejected when the first graft removal before the translpant. Molecular and cellular analysis revealed a significant increase in the percentage of graft-infiltrating Tregs in tolerance mice compared to syngeneic controls ($p < 0.05$). qPCR analysis further demonstrated significant up-regulation of BATF,T-BET, ST-2, and KLRG1 expression levels in syngeneic graft-infiltrating Tregs($P<0.05$).
Conclusions : Treg dependent donor specific tolerance were maintained by systemic and local regulation. Graft infiltrating Treg in the 1st graft express effector phenotype. Future research will focus on elucidating the specific functions of the graft Tregs.

abst.png


aCD80/86 mAb
10 mg/kg
BALB/c
HHTx
POD
0 1 2 3 4 5 6 7 8 9
Foxp3<DTR/GFP>B6
Diphtheria Toxin(DT)
0.02 mg/kg


Graft survival
Survival (%)
100
80
60
40
20
0
0 10 20 30 40 50 60 70 80
Days after transplantation
no treated n=5
aCD80/86mAb n=5
aCD80/86mAb+DT n=5

Abstract Submission No.: OP-0205

Characterizing the Underlying Mechanisms of Antibody-Mediated Rejection in Kidney Transplantation Using a Multiome Approach

MINJI KANG[1], Yewon Moon[1], Brian H. Lee[1], Sanha Hwang[1], Dongjun Kim[1], Sehoon Park[2], Hajeong Lee[2], Hyun Je Kim[1]
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[2]Department of Internal Medicine, Seoul National University Hospital, Korea, Republic of

Objectives : Antibody-mediated rejection (ABMR) is the leading cause of graft loss after kidney transplant (KT), associated with poorer prognosis and lower therapeutic responsiveness compared to T cell-mediated rejection (TCMR). While Donor-specific antibodies (DSA) are a major risk factor for ABMR in KT, the role of non-HLA antibodies has gained prominence in recent years. Given the heterogeneity of ABMR, it is crucial to understand its underlying mechanisms.
Methods : We conducted a multiome analysis by performing RNA and ATAC sequencing simultaneously on nuclei isolated from the same cells, using pre- and post-transplant peripheral blood mononuclear cells (PBMCs) from both ABMR and non-ABMR patients who did not experience ABMR after transplantation.
Results : Our findings revealed a significant elevation of natural killer (NK) cells in the post-ABMR group compared to the post-non-ABMR group. Moreover, S100A9 expression in NK cells increased in post-ABMR patients but decreased in post-non-ABMR patients when compared to their respective pre-operation samples. Similarly, IL10RA expression was reduced in post-ABMR patients but increased in post-non-ABMR patients.
Conclusions : These observations suggest a pro-inflammatory state and impaired immune regulatory function of NK cells in ABMR cases. By elucidating the mechanisms of ABMR, this study aims to improve graft outcomes through early diagnosis and prompt treatment.

Abstract Submission No.: OP-0015

GSDMD and its Concomitant Pyroptosis Are Potential Therapeutic Target in Acute Cardiac Transplantation Rejection

Weihua Gong
Department of Surgery, Zhejiang University, China

Objectives : Acute cellular rejection in cardiac transplant recipients is always accompanied by intragraft cell damage with subsequent exposure to cardiac autoantigens. It is known that activation of cardiomyocyte gasdermin D (GSDMD) and its concomitant pyroptosis are non-ignorably involved in multiple cardiac pathological conditions. This present study attempted to investigate the role of pyroptosis in cardiac transplantation.
Methods : In our acute rejection transplant model, C57B/6 donor heart was transplanted into Balb/c mice. The harvested grafts were subject to molecular and immunohistochemical analysis. FACS analysis was utilized to clarify the role of various immune cells.
Results : Our findings revealed a gradual augmentation of protein expression level of GSDMD and cleaved N-terminal-GSDMD (N-GSDMD) on day 3 and day 5. Expression levels of IL-1β, IL-18, and HMGB1 mRNA was significantly increased on day 3 and day 5. N-GSDMD is essential in the process of pyroptosis since it is capable of promoting the secretion of matured IL-1β and inducing damage of the plasma membrane. A significant prolonged survival of cardiac allografts was successfully achieved by using GSDMD inhibitor, NU6300 (acute rejection group versus NU6300 group; p=0.0224). Furthermore, additional administration of rapamycin could lead to an apparently significant prolongation of allografts (acute rejection group versus rapamycin+Nu6300 group; p=0.0025). The underlying mechanism was closely involved in the process of p-STAT3 signaling pathway.
Conclusions : GSDMD and its concomitant pyroptosis play critical roles in the course of cardiac transplantation and could serve as a potential therapeutic target to prevent graft rejection.

Abstract Submission No.: OP-0016

The Autophagy Level of Myocardioblasts Could Significantly Alter the Process of Cardiac Acute Rejection

Weihua Gong, zelai wu
Department of Surgery, Zhejiang University, China

Objectives : Myocardioblasts as main population in heart are involved in the various cardiac pathophysiological events including ischemic and pro-inflammatory diseases. However, the role of myocardioblasts remains obscure in cardiac transplantation.
Methods : In our cardiac transplant model of acute rejection, donor hearts from wildtype Balb/c and myocardioblasts ATG5-knockout mice were respectively transplanted into C57B/6 mice. The harvested grafts were subject to molecular and immunohistochemical analysis. FACS analysis was utilized to clarify the role of various immune cells.
Results : Our findings revealed the recipients with allografts from myocardioblasts ATG5-knockout mice could remarkably survive longer than those with wild-type donors (p=0.0246). A significant prolongation of allografts might be achieved by additional administration of rapamycin (p=0.0339). The myocardioblasts characterized by its novel function of antigen-presenting highly expressed MHC I, which was mediated by IFN-γ and dependent upon the autophagy level of myocardioblasts. In those allografts with prolonged survival, statistical decrease of percentage of CD8+ T cells was detected. mRNA expression levels of pro-inflammatory cytokines IL-6, IL-1β, TNF-α, and IL-18 were concomitantly significantly decreased (p=0.0027; p=0.0199; p=0.0128; p=0.0031;).
Conclusions : Our study unveiled the novel role of myocardioblasts in cardiac transplantation. Therapeutic intervention for myocardioblasts autophagy will remarkably alter cardiac transplant tolerance, which would shed light on strategies for avoiding graft rejection.

Abstract Submission No.: OP-0182

Exploring the Molecular Pathways of Intracranial Aneurysm Formation in Autosomal Dominant Polycystic Kidney Disease using Proteomic Analysis

JIN-MYUNG KIM[1], Hee-Sung Ahn[2], Hye Eun Kwon[1], Youngmin Ko[1], Joo Hee Jung[1], Hyunwook Kwon[1], Young Hoon Kim[1], Kyunggon Kim[2], Sung Shin[1]
[1]Department of Kidney and Pancreas Transplantation, Asan Medical Center, Korea, Republic of
[2]Department of Convergence Medicine Research Center, Asan Medical Center, Korea, Republic of

Objectives : Intracranial aneurysm (IA) frequently coincides with autosomal dominant polycystic kidney disease (ADPKD), exhibiting incidence rates nearly 10 times higher than the general population. However, the exact mechanism of how these two conditions is related remains unclear. This study aims to identify mechanisms behind IA occurrence in ADPKD patients using proteomics and to discover potential protein biomarkers for early diagnosis.
Methods : Pre-kidney transplantation ADPKD patients underwent cranial CT and/or MR angiography, with findings dictating assignment to either a control group (ADPKD without IA, n=20), an IA group (ADPKD with IA, n=9). During transplantation, bilateral nephrectomy was performed and native renal arteries were sampled for proteomic analysis via a liquid chromatography-tandem mass spectrometry. Differentially expressed proteins were subjected to bioinformatic analysis and a protein-protein interaction network analysis.
Results : Eight proteins showed significant variation between IA and control groups, with four proteins upregulated (DIS3, MMS19, EXOC8, RAB6A) and four downregulated (CLUH, SYNC, MEF2D, WDR36) in IA group (Log_2 fold change (FC) >2 and false discovery rate [FDR] q-value <0.05) compared to the control group. These proteins correlated with pathways implicated in IA development, such as ciliopathy, exocytosis, inflammation, extracellular matrix remodelling, and apoptosis. These proteins were quantitatively validated using immunoblot and found to be consistent with proteomic data. Moreover, a connection was observed between protein expression and clinical metrics (bilirubin, prothrombin time, platelet count), indicating their potential as early diagnostic markers.
Conclusions : This study is the first to employ renal artery samples to study underlying mechanisms for IA in ADPKD patients by proteomics. We identified and validated novel candidate markers that are either upregulated or downregulated in the IA group compared to the control group. This research's finding opens new avenues for understanding and diagnosing IA in ADPKD, potentially leading to earlier diagnosis and targeted treatments.

ADPKD.jpg

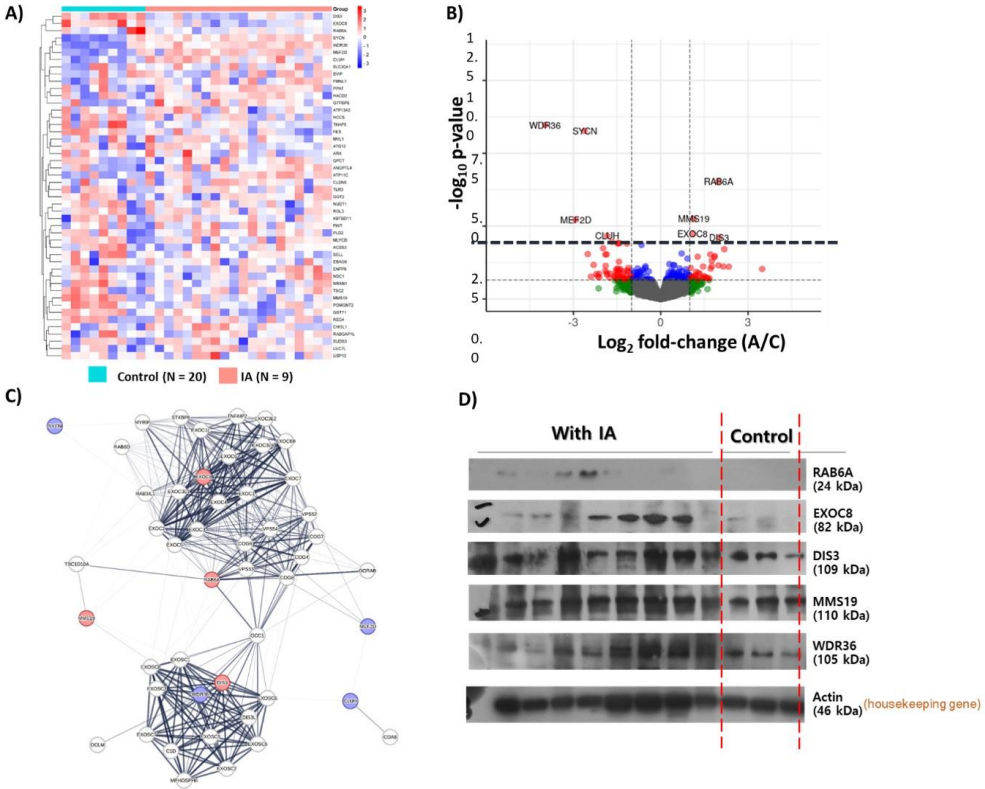


Figure 1. (A) Heatmap visualization of proteomic expression (B) Differential protein expression analysis via volcano plot (C) Protein-protein interaction network in intracranial aneurysm versus control group (D) Western blot analysis of rotein expression in different samples.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 6
(Xenotransplantation)

Abstract Submission No.: OP-0350

World's First Trial Assessing Feasibility and Safety of Genetically-Engineered Pig Red Blood Cell Xenotransfusion in a Brain-Dead Human Subject

Hidetaka Hara[1], Tao Li[1], Yong Wang[2], Ting Yan[1], Xiangyang Xing[2], Yu Hang[3], Hongtao Jiang[1], Pan Dengke[2], Yi Wang[1]
[1]Department of Transplantation Institute, The Second Affiliated Hospital, Hainan Medical University, China
[2]Department of N/A, Chengdu Clonorgan Biotechnology Co., Ltd, China
[3]Department of Department of Cardiovascular and Vascular Surgery Intensive Care Unit, The Second Affiliated Hospital, Hainan Medical University, China

Objectives : The global shortage of human red blood cells (RBCs) presents a significant challenge, particularly in emergency situations where immediate transfusions are critical. This scarcity, worsened by conditions such as alloimmunization and rare blood types, calls for alternative solutions. This study aimed to assess the feasibility, safety, and immunological response to genetically engineered (GE) pig RBCs (pRBCs) as a potential alternative in critical care settings.
Methods : GE pRBCs were created using CRISPR/Cas9 technology to knock out three key xenoantigens (Gal, Neu5Gc, and Sda), resulting in triple knock-out RBCs. These cells were further modified to express the human complement regulatory protein CD55. Pigs were housed in a pathogen-free facility. After isolation and CFSE labeling for tracking, the GE pRBCs were transfused into a brain-dead human subject. Pre-transfusion treatment included an anti-C5 inhibitor, a corticosteroid, and an antihistamine. Monitoring included continuous vital sign tracking, blood sampling for lab tests, immunological assessments, complement activity assays, and pathogen screening over 14 days.
Results : The GE pRBCs exhibited a survival rate of 50% at 24 hours, 15% at 48 hours, and were fully cleared by 72 hours. Minimal anti-pig IgM binding was observed pre-transfusion, which decreased after transfusion but rebounded on day 3. Anti-pig IgG levels, initially undetectable, significantly increased by day 7, with heightened complement-dependent cytotoxicity and hemagglutination. Complement assays showed activation of classical and alternative pathways, moderated by regulatory mechanisms. No pig-derived pathogens were detected in the recipient.
Conclusions : This first-in-human study demonstrates that GE pRBCs could be a viable, safe alternative for emergency transfusions when human RBCs are unavailable. The manageable immune response and absence of zoonotic infection support further development of xenotransfusion as a solution to global RBC shortages in critical care.

Figure for Abstract.JPG

Figure

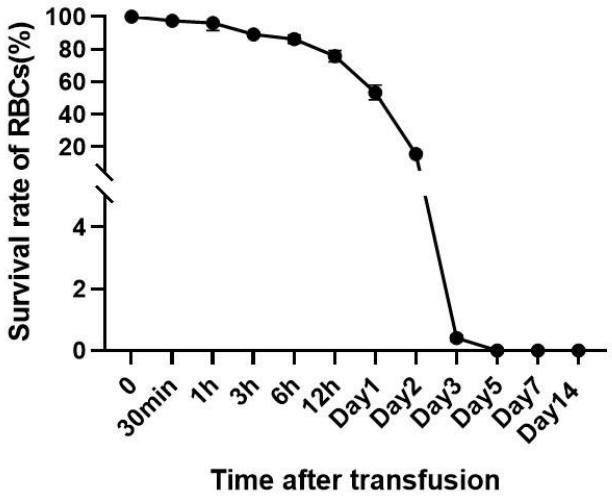


Figure Legend:
The survival of CFSE-labeled TKO/CD55 pig RBCs transfused into a brain-dead human subject over a 14-day period. The survival rate of the transfused GE pRBCs decreased progressively, with 50% remaining at 24 hours, 15% at 48 hours, and complete clearance by day 3 post-transfusion.

Abstract Submission No.: PP-0304

The Results of Partial Thickness Corneal xenotransplantation to Non-human Primates Using Multiple Gene-engineering Pigs.

Ki Cheul Shin[1], Sun Ae Hwang[2], Yu Rim Ahn[2], Ik Jin Yun[2]
[1]Department of Ophthalmology, Konkuk University Medical Center, Korea, Republic of
[2]Department of Surgery, Konkuk University Medical Center, Korea, Republic of

Objectives : Allotransplantation is widely performed as the most effective method to treat organ failure in humans, but is limited due to the shortage of organ donation. Among various methods to solve the limitations of allogenic transplantation, xenotransplantation using animals other than humans is an effective method to solve the imbalance of supply and demand of allotransplantation. Recently, many attempts have been made to reduce rejection reactions in xenotransplantation using transgenic pigs. The xenotransplantation team at Konkuk University has performed 16 cases of partial-thickness corneal xenotransplantation using transgenic pigs on non-human primates from 2011 to the present and we would like to report the results.
Methods : Each transgenic pig was GTKO (n=1), GTKO+CD46 (n=9), GTKO+CD46+CD73 (n=2), GTKO+CD46+TBM (n=3), and TKO (n=1). Partial thickness corneal transplantation was performed with a diameter of 7.0 mm and a thickness of approximately 300 μm. Post-transplant immunosuppression was performed with intramuscular, subconjunctival steroid injection, and steroid eyedrop.
Results : The mean survival time of grafts according to the type of transgenic pig were GTKO100 days, GTKO+CD46 372 days, GTKO+CD46+CD73 39 days, GTKO+ CD46+TBM 358 days, and TKO 26 days. The types and average survival days of transgenic pigs that survived for more than 200 days were GTKO+CD46(n=5) 625 days and GTKO+CD46+TBM(n=2) 490 days.
Conclusions : The transgenic pigs that underwent partial-thickness corneal xenografting were diverse and the number of individuals varied, so there is insufficient data to draw specific conclusions. However, it was not confirmed that TKO had a positive effect on graft survival compared to GTKO, and CD46 and TBM knock-in were seemed to be helpful in increasing graft survival. Although initial graft rejection could occur with multiple gene engineering, it seems that long-term graft survival can be ensured with effective immunosuppression. So, additional immunosuppression will be needed after partial thickness corneal xenotransplantation in the future.

Abstract Submission No.: OP-0462

Immunological and Pathological Outcomes for Immunosuppressant Combinations in Kidney Xenotransplantation Using Multiple, Genetically Modified Pigs

Kyu-hyun Han[1], Il Hee Yun[1], Hwan Lee[1], Minhee Seong[1], Ki Myung Choi[3], Hyun-il Kim[3], Sangil Min[2], IK Jin Yun[4], Jaeseok Yang[1]
[1]Department of Division of Nephrology, Department of Internal Medicine, Yonsei University College of Medicine, Korea, Republic of
[2]Department of Department of Transgenic Animal Research, Optipharm, Inc., Korea, Republic of
[3]Department of Surgery, Seoul National University Hospital, Korea, Republic of
[4]Department of Department of Surgery, Konkuk University School of Medicine, Korea, Republic of

Objectives : We aimed to compare immunological and pathological outcomes according to different combinations of immunosuppressants and genetically-modified pigs in kidney xenotransplantation.
Methods : Kidney xenotransplantation was performed in eleven cynomolgus monkeys. A group (n=4) used donor pigs with quadruple knockout (GGTA1, CMAH, B4GalNT2, iGb3s) and double knockin (hCD46, hTBM), and its immunosuppressive regimen consisted of thymoglobulin (x2), rituximab, cobra venom factor, anti-CD154 (C10), and triple maintenance immunosuppressant (steroid, tacrolimus, mycophenolate mofetil). B group (n=3) used the same donor pigs and received abatacept along with immunosuppressants of A group. C group (n=3) used quadruple knockout and quadruple knockin (hCD39, hCD55, hCD46, and hTBM) pigs. The group C used anti-C5 inhibitor (crovalimab) instead of cobra venom factor, modified anti-CD154 (PG-405), single shot of thyrmoglobulin, and anti-ICAM-1 antibody (MD-3), with other immunosuppressants that the group A used.
Results : The graft survival did not show significant differences among the three groups. T cells were well-suppressed in the A and B groups; however, they were bounced at 1 week in the C group. Donor-specific antibodies appeared at 4 weeks post-transplantation in one and three monkeys in the A and C groups, respectively. C3a and thrombin-antithrombin complex were positive in one monkey in the A group and there was no elevation of plasma C5a or membrane attack complex in any group. Either TNFα or IL-6 were not changed in any group. Kidney biopsy at 4 week showed infiltration of CD68+ macrophages and CD61+ platelets in the A and B groups and deposits of membrane attack complex in the A group. There was no definite evidence of T cell-mediated or antibody-mediated rejection and thrombotic microangiopathy was suspicious as the main pathologic cause of kidney xenograft dysfunction.
Conclusions : Thrombotic microangiopathy was the main cause of xenograft dysfunction in kidney xenotransplantation using QKO/QKI pigs under anti-CD154-based immunosuppressants.

Abstract Submission No.: OP-0398

Antibodies to Unknown Antigens Other Than Swine Leukocyte Antigens on GTKO/4GalNT2KO Pig Cells Are Associated with Acute Humoral Xenograft Rejection

Songzhe He[1], Tao Li[1], Hao Feng[3], Dengke Pan[4], Gang Chen[3], Hidetaka Hara[2], Yi Wang[2]
[1]Department of Kidney and Pancreas Transplantation, The Second Affiliated Hospital of Hainan Medical University, China
[2]Department of The Transplantation Institute , Hainan Medical University, China
[3]Department of Institute of Organ Transplantation of Tongji Hospital, Huazhong University of Science and Technology, China
[4]Department of , Chengdu Clonorgan Biotechnology Co., Ltd, China

Objectives : Despite encouraging advancements in experimental life-supporting pig renal xenotransplantation, acute humoral xenograft rejection (AHXR) remains a significant barrier to the survival of nonhuman primates receiving genetically modified pig kidneys. This challenge may be linked to the expression of additional xenoantigens except the two known antigens (Gal and Sda). Our study aims to elucidate the impact of preformed antibodies against unknown xenoantigens, as well as the antibodies elicited in response to GTKO/β4GalNT2KO-based pig-to-rhesus renal xenotransplantation.
Methods : Rhesus monkeys (n=7) received kidneys from GTKO/β4GalNT2KO (n=1) or GTKO/β4GalNT2KO/hCD55/hTBM (n=3) pigs. We collected serum samples from both the recipients and naïve rhesus monkeys. We incubated serum with GTKO/β4GalNT2KO pig red blood cells (pRBCs) to measure remaining antibodies to pig peripheral blood mononuclear cells (pPBMCs). Antibody binding and cytotoxicity of serum to GTKO/β4GalNT2KO or GTKO/β4GalNT2KO/hCD55/hTBM pig PBMCs or RBCs were measured by flow cytometry. After the euthanasia recipients, the grafts were examined by histological assessment.
Results : The 7 recipients survived less than 30 days, experiencing increased serum creatinine and decreased platelet counts. All developed elevated anti-pig antibodies (IgG or IgM), with kidney histopathology revealing AHXR and thrombotic microangiopathy. Immunohistochemistry detected C3c, C4d, IgM and/or IgG, C5b-9 deposition, and CD68 infiltration in most grafts. Despite absorption on pig RBCs, serum anti-pig antibodies remained high, suggesting the involvement of other xenoantigens, such as swine leukocyte antigens (SLA) or other unknown antigen, expressed on PBMCs but not RBCs. Differences in antibody binding between unabsorbed and absorbed serum indicated the presence antibodies of anti-unknown antigen which expressed on PBMCs and RBCs.
Conclusions : This study reveals that unknown antigens significantly contribute to the early antibody-mediated immune response in naive rhesus monkeys, playing a crucial role in acute humoral xenograft rejection (AHXR) following GTKO/β4GalNT2KO-based pig to nonhuman primates kidney transplantation.

Abstract Submission No.: OP-0119

Regulatory Macrophages as a Therapeutic Strategy to Mitigate Immune Responses in Xenotransplantation

Phu Chi Vu[1], Thi Xoan Hoang[1], Jong Hyeok Jung[1], Hyeon Ho Lee[1], Min Guk Lee[1], Tra My Tran[1], Min Hyuck Kim[1], Nhat Minh Dang[1], Ik Jin Yun[2], Jae Young Kim[1]
[1]Department of Department of Life Sciences, Gachon University, Korea, Republic of
[2]Department of Surgery, Konkuk University Medical Center, Korea, Republic of

Objectives : Xenotransplantation is emerging as a promising strategy to address the critical shortage of human organ donors. However, a major challenge in xenotransplantation is the immune response of the recipient against the transplanted organ, which leads to graft rejection. In this study, we investigated the immunomodulatory potential of porcine regulatory macrophages in suppressing the proliferation of monkey T cells and reducing the inflammatory response of human M1 macrophages against porcine endothelial cells.
Methods : Peripheral blood mononuclear cell-derived porcine macrophages were treated with M-CSF and IFN-γ to induce a regulatory phenotype, which was evaluated through cytokine expression profiles and the suppressive effects on T cell proliferation and the inflammatory responses of M1 macrophages in co-culture experiments.
Results : These regulatory macrophages demonstrated key characteristics, including high expression of anti-inflammatory cytokines such as IL-10 and TGF-β, and exhibited the ability to inhibit porcine T cell proliferation. Notably, these regulatory macrophages significantly suppressed the proliferation of ConA-stimulated monkey CD4+ T cells. Additionally, when human M1 macrophages were pre-cultured with these regulatory macrophages prior to exposure to porcine endothelial cells, there was a marked reduction in the expression of inflammatory cytokines, indicating a potential decrease in M1 macrophage-mediated inflammatory responses.
Conclusions : This study highlights the potential application of donor-derived regulatory cell therapy as a novel approach to overcoming immune barriers in xenotransplantation. These findings suggest that regulatory macrophages could play a crucial role in promoting graft tolerance and mitigating the risk of rejection in xenotransplantation. This research was financially supported by the Ministry of Health & Welfare (grant number: RS-2023KH136898), and by the Institute of Civil Military Technology Cooperation, funded by the Defense Acquisition Program Administration and the Ministry of Trade, Industry, and Energy of the Korean government (grant number: 22-CM-EC-18).

Abstract Submission No.: OP-0228

The status of genetically modified pigs-to-brain dead patients xenotransplantation in China

Tao Li, Hidetaka Hara, Hongtao Jiang, Songzhe He, Jianli Wang, Huiling Gan, Liang Xu, Meng Yang, Yi Wang
Department of Kidney and Pancreas Transplantation, The Second Affiliated Hospital of Hainan Medical University, China

Objectives : The results of genetically modified pigs-to-non humans primates (NHPs) are encouraging recently. Therefore, brain-dead (BD) patients were used as xenotransplant recipient subjects before clinical trials. In China, five cases of genetically modified pig-to-BD xenotransplantation have been performed. This study will briefly introduce 2 of these cases and provide detailed information on the remaining 3 cases.
Methods : 5 case of genetically modified pigs to-BD patients, 3 cases of BD patients were life-support kidney transplantation (3 donor pigs genotype were TKO/hCD55, TKO/hCD55/hTBM, TKO/hCD55/hCD46/hTBM respectively).1 case of BD patient underwent heterotopic liver xenotransplantation (donor pig genotype is TKO/hCD55/hCD46/hTBM) and another 1 case of BD patient underwent xenotransfusion (donor pig genotype is TKO/hCD55/hTBM). Regular post-surgery examinations were conducted on the recipients, and the pathology of 2 renal xenotransplant recipients was evaluated.
Results : (1) One kidney xenograft recipient survived for 22 days and maybe associated with rejection. (2) The other two kidney xenograft recipients survived for 12 days, these two kidneys from TKO and TKO/hCD55/hTBM, were transplanted into two brain-dead human decedents with their own bilateral kidney donated, and then treated with conventional immunosuppression. Xenograft function, antibody and cell mediated immunologic reactions, histopathologic changes and potential zoonosis were monitored. No typic hyperacute rejection episodes were observed in the Phase I period despite conventional immunosuppression. The kidneys functioned well initially, with normal urinary output and serum creatinine levels maintained for 3-5 days. However, in Phase II, irreversible acute rejection gradually developed, leading to complete graft loss by day 12. (3) The liver xenograft survived for 10 days, and the patient's family requested that the experiment be terminated. The liver function was normal. (4) After xenotransfusion, the results showed that pig RBCs were completely cleared by 72 hours post-transfusion.
Conclusions : The BD model can be effectively utilized for xenotransplantation, especially in the field of xeno-immunity.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 7
(Lung)

Abstract Submission No.: OP-0152

The use of extended criteria donors decreases one-year survival in high-risk lung recipients: A review of the Korean Network for Organ Sharing Database

Eunjeong Choi, Woo Hyun Cho, Hye Ju Yeo
Department of Pulmonology, Pusan National University Yangsan Hospital, Korea, Republic of

Objectives : We investigated the impact of donor quality, based on recipient severity, on survival after lung transplantation.
Methods : We analyzed lung transplant recipients aged 18 years or older from 2010 to 2023 using the Korean Network for Organ Sharing dataset. Extended-criteria donors were defined as those meeting at least one of the following conditions: age 55 years or older, a smoking history of 20 pack-years or more, or a PF ratio below 300 mmHg. Donors not meeting these criteria were considered standard donors. Recipients were classified by severity (Status 0 or other status). The primary outcome was 1-year survival after lung transplantation.
Results : Among 1,251 lung recipients, 422 (33.7%) received organs from extended-criteria donors. Extended-criteria donors were associated with an increased hazard of death (hazard ratio [HR], 1.49; 95% confidence interval [CI], 1.21-1.83; P<.001). In Cox regression models, the hazard of death increased for recipients with other status who received extended-criteria donor organs (HR, 1.99; 95% CI, 1.40-2.84; P<.001) and for recipients with Status 0 who received standard donor organs (HR, 1.93; 95% CI, 1.44-2.59; P<.001), with the highest risk observed in recipients with Status 0 who received extended-criteria donor organs (HR, 2.48; 95% CI, 1.81-3.40; P<.001), compared to recipients with other status who received standard donor organs.
Conclusions : Extended-criteria donors are associated with reduced 1-year survival, with the lowest survival observed in Status 0 recipients who receive extended-criteria donor organs.

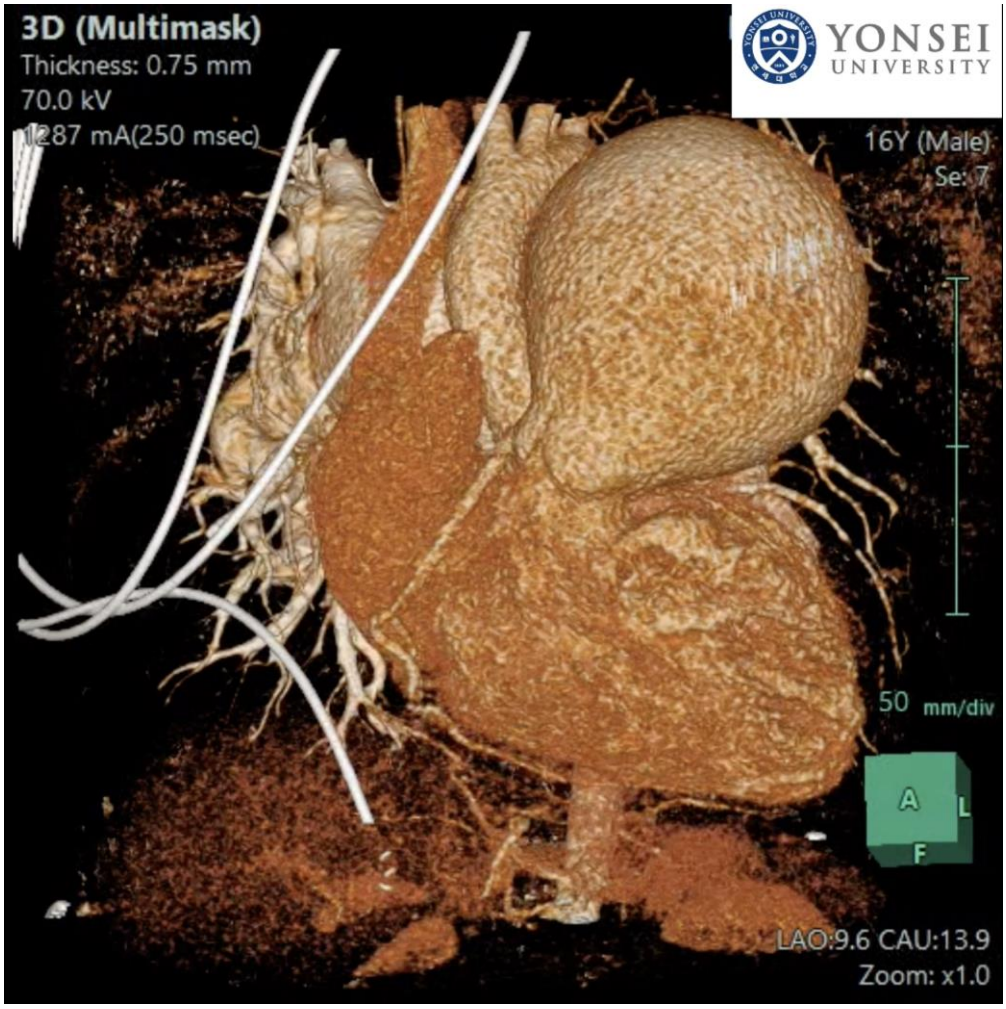
Abstract Submission No.: OP-0217

Surgical Treatment of Pulmonary Artery Aneurysm in Pulmonary Arterial Hypertension Using Venoarterial Extracorporeal Membrane Oxygenation: A Case Report

Minh Dung Nguyen[1], Young Ho Yang[2], Ha Eun Kim[2], Yu Rim Shin[2], Han Ki Park[2], Jin Gu Lee[2]
[1]Department of Thoracic and Cardiovascular Surgery, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam
[2]Department of Thoracic and Cardiovascular Surgery, Yonsei University College of Medicine, Korea, Republic of

Case Study : Pulmonary artery aneurysm (PAA) in the context of pulmonary arterial hypertension (PAH) presents a complex clinical scenario, posing challenges for treatment. We present the case of a 16-year-old male diagnosed with severe primary PAH and a 105mm PAA, who exhibited resistance to conventional medical therapy. This situation necessitated consideration for bilateral lung transplantation (BLT). The patient underwent BLT with aneurysmorrhaphy to address the dilated pulmonary artery, facilitated by peripheral venoarterial extracorporeal membrane oxygenation (VA-ECMO) support. At the two-year follow-up post-surgery, the patient demonstrated favorable recovery with no notable cardiovascular events and absence of recurrent dilation. To our knowledge, this is the first reported case utilizing ECMO in conjunction with BLT and aneurysmorrhaphy for a patient with PAH accompanying PAA. Clinical experiences regarding this type of condition need to be accumulated step by step.

ATW.png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Abstract Submission No.: OP-0218

Lung transplantation for plueroparenchymal fibroelastosis a single center experience of 7 cases

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Case Study : Pleuroparenchymal fibroelastosis (PPFE) is a rare disease characterized by progressive pleural thickening and adjacent subpleural interstitial lung fibrosis, predominantly in the upper lobe. Lung transplantation (LT) is considered as the therapeutic option since no medical treatment is proven to be effective. Previous reports showed successful outcomes of LT for PPFE without complications although long term outcomes are limited. The aim of the study is to report our single center experience for patients subjected to LT for PPFE from 2015 to 2024. We have performed bilateral LTs for 7 patients with idiopathic PPFE (3 females and 4 males). 2 patients had idiopathic pulmonary fibrosis (IPF). One patient had liver cirrhosis due to autoimmune hepatitis thus received multiorgan transplant of lung-liver. Mean age of the patients was 54.9 and mean BMI was 18.4. Only one of them was ex-smoker while others were never smoker. Among 7 patients, only 2 patients experienced pneumothorax before LT. Mean pulmonary artery pressure was 28.2 while 2 patients did not have right heart catheterization data. Mean ICU and in hospital stays were 11 and 48.1 days, respectively. 3 patients had tracheostomy otherwise, other 4 patients succeeded in ventilator weaning. No patient developed primary graft dysfunction or chronic lung allograft dysfunction but 1 patient developed bronchiolitis obliterans syndrome. Pulmonary function tests underwent 1 month after operation showed improvements in FVC, FEV1 and DLCO. Up to date, 3 have died and 4 are still alive with mean overall survival of 29.4 months. The causes of death were; 1) subarachnoid hemorrhage, liver cirrhosis 2) pneumonia, sepsis 3) Burkitt lymphoma. In conclusion, LT for PPFE has reliable results in terms of post-transplant lung function improvement, complications and survival despite coexisting other ILDs however the prognosis differs due to the underlying clinical conditions.

Table1.png

Patient	Age	Sex	BMI	Smoking	PKyrs	Pneumothorax	mPAP	RVSP	Diagnosis	Diagnosis date	Op date	LT
#1	50	Female	19.5	Nonsmoker	0	Yes	25	53	iPPFE	2013	2016-04-02	BLT
#2	48	Male	20.4	Ex-smoker	14	No	NA	45	iPPFE	2018	2019-03-13	BLT
#3	58	Female	19.3	Nonsmoker	0	No	20	29	iPPFE	2016	2020-11-21	BLT
#4	64	Male	16.9	Nonsmoker	0	Yes	25	67	iPPFE, IPF	2017	2021-08-12	BLT
#5	51	Male	17.1	Nonsmoker	0	No	22	35	iPPFE, IPF	2015	2021-12-04	BLT
#6	57	Female	16.5	Nonsmoker	0	No	49	26	iPPFE	2020	2023-08-24	BLT
#7	56	Male	19.4	Nonsmoker	0	No	NA	25	iPPFE	2019	2024-07-02	BLT

Abstract Submission No.: OP-0117

The Impact of Levels of Preoperative Rehabilitation prior to Lung Transplantation in ECMO Bridged Patients

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Objectives : Preoperative Rehabilitation is crucial to be able to have good outcomes in Lung Transplantation. Due to unique challenges, not all lung transplant candidates are able to achieve full ambulatory rehabilitation, especially while on ECMO bridging. We explored the possible effects of different levels of preoperative rehabilitation in outcomes of lung transplantation.
Methods : This was a retrospective study of all lung transplant recipients from January 2013 to December 2021. Baseline characteristics, intraoperative factors and postoperative factors were extracted and analyzed from subjects grouped into NR – No Rehabilitation group; PR – Passive Rehabilitation group; AR – Active Rehabilitation group; AM – Ambulatory group. Patients were followed up until last known consult post transplantation.
Results : A total of 286 subjects were enrolled with the classified into NR group (n=24), PR group (n=50), AR group (n=38) and AM group (n=174). Intraoperative weaning from ECMO (p value = 0.012) and intraoperative blood loss (p value < 0.001) were significantly different between groups, with better results seen in the AR and AM groups. For postoperative outcomes, PGD Grading at 24 hours and 48 hours (p value = 0.033 and 0.046, respectively), frequency of primary graft rejection (p value = 0.047) reoperation due to bleeding (p value = 0.021), time to ventilator weaning (p value = 0.001), length of ICU (p value < 0.001), total postoperative stay (p value = 0.005) and 1-year mortality after transplantation were significantly different between groups, also with more favorable figures in the AR and AM groups.
Conclusions : Active preoperative rehabilitation can be a significant factor in improving intraoperative and postoperative outcomes in Lung Transplantation.

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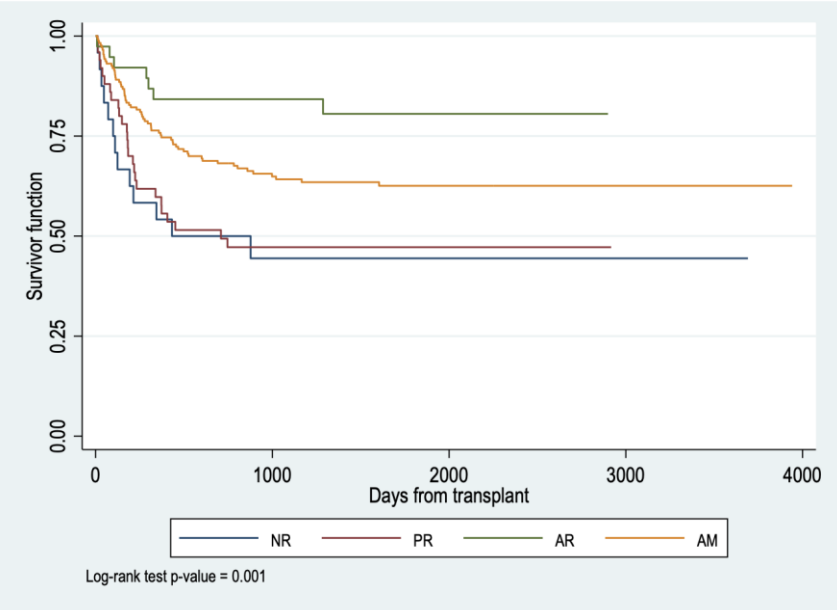

Figure 4. Survival curve of each group post lung transplantation. NR – No Rehabilitation group; PR – Passive Rehabilitation group; AR – Active Rehabilitation group; AM – Ambulatory group.

Abstract Submission No.: OP-0220

Comparison of Short Stature Versus Non-Short Stature Recipients in Lung Transplantation

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Objectives : Shorter height have been reported as a predictor of higher waiting list mortality due to the attempt of finding donor lungs of similar size. However, there has been few studies about the results of short-stature lung transplantation. Therefore, we aimed to compare the results of lung transplantation in short stature versus non-short stature recipients.
Methods : From 2010 to 2023, 158 patients underwent lung transplantation in our center. The patients' demographic, operative, and survival data were retrospectively collected from medical records. The patient group was divided into short stature group (<155cm, n=36) and non-short stature group (≥155cm, n=122).
Results : Short stature group was more female-dominant (83.3% vs. 27.9%, p<0.001), younger (45±24yo, 54±14yo, p=0.028) and had less BMI (18.7±4.6, 20.6±3.8, p=0.027). They utilized donor lungs of shorter height (159.4±18.5cm, 167.6±8.4cm, p=0.014) and higher pTLC ratio (1.37±0.26, 1.02±0.22, p<0.001). Short statue group underwent donor lung resection more frequently (38.9% vs. 17.2%, p=0.006). ECMO use on waiting list was less frequent in short stature group (19.4% vs. 39.3%, p=0.028). There was no statistical difference of waiting duration before transplantation, postoperative ICU and hospital stay. There was no statistical difference of 30-day mortality. (5.6% for short stature group, 6.6% for non-short stature group, p=1.000). 5-year survival rate was significantly different between two groups. (83.3% for short stature group, 49.3% for non-short statue group, p=0.005).
Conclusions : Lung transplantation in short stature patients can have favorable outcomes compared to non-short stature population. Implanting oversized lung with appropriate donor selection and lung volume reduction can help short-stature lung transplant candidates.

Abstract Submission No.: OP-0208

Case series of Lung transplantation for pleuroparenchymal fibroelastosis: Remodeling of thoracic cavity

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Objectives : Pleuroparenchyma fibroelastosis (PPFE) is a rare condition of interstitial pneumonia characterized by fibrosis and elastosis involving the pleura and lung parenchyme, mainly the upper lobes. Patients with PPFE demonstrated unique features of low body mass index (BMI) and flattened thoracic cage. For the patients with advanced PPFE, there is no currently available specific treatment and lung transplantation is the only effective therapeutic option. However, due to the rarity of the disease, there are only a few reports about lung transplantation for PPFE patients. Thus, this study aims to analyze the clinical course of lung transplantation for PPFE and the remodeling of the thoracic cage after the transplantation.
Methods : Six patients affected by PPFE who underwent lung transplantation at a single center from Jan 2013 to Dec 2023 were included, and prospectively collected clinical variables from each case were analyzed retrospectively. For analyzing the remodeling of the thoracic cavity, the ratio of transverse diameter (TD) to anterior-posterior diameter (APD) of the thoracic cavity is measured at the level of the 6th thoracic vertebra in the horizontal section of the chest CT (computed tomography) taken preoperative, postoperative 1st year, and last follow-up (Figure 1.).
Results : The preoperative, postoperative, and follow-up features of the patients are detailed in Table 1. In this case series, the outcomes following lung transplantation in PPFE patients vary, but they appear to be similar to those of other causes. Importantly, our findings indicate that lung transplantation has improved the flatness of the thoracic cavity in PPFE patients.
Conclusions : Lung transplantation can be a viable option for patients with end-stage PPFE, but still need longer follow-up with a large number of patients is needed.

Table & Figure.png

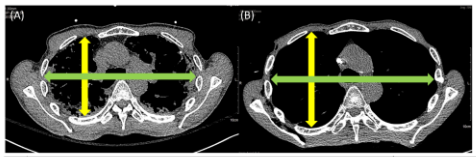

Figure 1. Chest CT images of a patient with PPFE at the level of the 6th thoracic vertebra. (A) before transplantation, (B) post-transplantation 1-year chest CT. The yellow arrow in each image represents apicoposterior diameter and the green arrow represents transverse diameter.

Patient	Preoperative characteristics																Operative					PGD			ICU stay (days)	Hospital stay (days)	TD/ATD		Post transplant PFT				CLAD	follow up duration	Status	Cause of death
	Age	Sex	BMI	Diagnosis modality	Time from diagnosis to transplant (days)	Time on wait list (days)	Pretransplant oxygenation	preop admission	preop ICU care	preop ECMO support	preop FVC (%)	preop FEV1 (%)	preop dlco test (m)	preop mPAP (mmHg)	D/R TLC	Type of transplantation	CP time (min)	adhesion	intraop cardiopulmonary support	prolonge ECMO	EBL	24hr	48hr	72hr			preop	postop 1year	last FU	post 3mon FVC (%)	post 3mon FEV1 (%)	last FVC (%)	last FEV1 (%)				
#1	50	F	20.03	chest CT	405	380	Nasal 2L	yes	yes	yes	15	17	380	37	103.1	BLT LLT Liver transplantation	380	minimal	VA ECMO	no	2000	1	1	0	4	19	17	16	16	50	63	71	77	no	3012	Alive	-
#2	46	M	21.91	chest CT	1623	153	Ventilator	yes	yes	no	59	63	NA	NA	103.1	BLT	827	no	VA ECMO	no	7300	0	0	1	8	30	1.5	1.6	1.6	44	56	26	36	no	275	Death	SAH d/t central aneurysm suture
#3	58	F	19.29	chest CT	1627	647	Nasal 2L	no	no	no	63	57	400	23	96.4	BLT	298	no	VA ECMO	no	1800	1	1	0	5	29	2.0	1.8	1.7	64	62	71	79	no	488	Death	sepsis
#4	64	M	16.76	VATS	1351	168	Ventilator	yes	yes	no	33	41	205	50	99.1	BLT	362	severe	VA ECMO	no	4800	1	0	0	4	29	2.0	1.8	1.7	36	43	35	71	no	1025	Death	lymphoma
#5	51	M	15.82	VATS	2322	320	Ventilator	yes	yes	yes	34	39	380	34	100.6	BLT	201	moderate	VAV ECMO	VV ECMO	1300	3	1	1	5	82	2.0	1.8	1.7	46	44	58	44	no	940	Alive	
#6	57	F	16.46	VATS	990	45	Ventilator	yes	yes	no	25	28	190	34	83.6	BLT	326	moderate	VA ECMO	VV ECMO	2200	3	1	2	8	43	2.2	1.9		27	30			no	312	Alive	

Table 1. Clinical characteristics of PPFE patients underwent lung transplantation

Asian Transplantation Week 2024

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Oral Presentation

Oral Presentation 8
(Coordinator)

Korean

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0103

뇌사 기증자를 위한 추모의 벽 설치 사례: 디자인부터 설치까지의 여정

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Case Study : 이 사례 연구는 뇌사 장기 기증자를 기리기 위한 추모의 벽이 디자인부터 설치까지 어떻게 진행되었는지 상세히 설명하며, 이 과정이 기증자 가족에게 미치는 긍정적 영향과 사회적 중요성을 강조합니다. 뇌사 장기 기증자는 생명을 구하는 데 필수적인 역할을 하며, 이들의 희생을 기리는 공간의 필요성을 강조합니다. 우리 병원은 이러한 기증자들에게 감사를 표하고, 그들의 기여를 기념하기 위해 2017 년에 추모의 벽을 기획했습니다. 초기 구상 단계에서는 뇌사 장기 기증자를 기념하고 그들의 헌신에 대한 존경을 표현하며, 동시에 장기 기증에 대한 인식을 높이는 것을 목표로 삼았습니다. 이를 위해 다른 병원의 유사한 프로젝트를 연구하고, 적절한 설치 장소를 확보하기 위한 논의를 진행했습니다. 디자인 과정에서는 기증자에게 감사를 표하면서도 방문객들이 편안하게 느낄 수 있는 공간을 만드는 것을 목표로 했습니다. 공간 유지 관리 문제와 팬데믹으로 인한 지연 등 여러 도전 과제에도 불구하고, 꾸준한 노력 끝에 올해 추모의 벽 설치에 대한 승인을 받을 수 있었습니다. 특히 올해는 우리 병원의 첫 뇌사 장기 기증자가 30 주년을 맞는 해로, 이를 기념하기 위해 추모의 벽이 더욱 중요한 의미를 가지게 되었습니다. 승인 후, 예산 관리와 업체 선정 과정을 거쳐, 30 주년에 맞춰 추모의 벽을 완공했습니다. 이식 센터는 추모의 벽의 콘텐츠와 유지 관리를 담당하며, 기증자 가족들에게 알리고 그들의 동의를 얻는 과정을 수행하고 있습니다. 또한, 이 추모의 벽은 다른 병원에서도 설치에 대한 영감을 제공할 수 있도록 홍보되고 있습니다. 이 사례는 기증자를 기리고, 헌신된 추모 공간을 통해 장기 기증에 대한 인식을 확산시키는 것의 중요성을 강조하며, 기증자 가족에게 긍정적인 영향을 미치고 장기 기증을 촉진하는 데 기여하고 있습니다.

Abstract Submission No.: OP-0076

전산통보시스템이 뇌사추정자 통보에 미치는 영향

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Case Study : 뇌사자 장기기증이 활발히 이루어지기 위해서는 뇌사추정자를 발굴하는 것이 매우 중요하다. 2011 년 뇌사추정자 통보의무제가 본격적으로 시행되었고, 2020 년부터 통보 활성화를 위해 KODA 에서 각 병원에 뇌사추정자 전산 모니터링 및 전자통보 시스템을 구축할 수 있도록 지원하였다. 2020 년 8 월부터 2024 년 2 월까지 전국 뇌사판정기관 99 개 중 43 개병원에서 뇌사추정자 전자통보시스템이 시행되고 있다. 본 연구에서는 단일기관의 전산통보시스템 도입 전후 통보된 환자 데이터를 분석하여 시스템이 뇌사추정자 통보에 미치는 영향을 분석하였다.
전산통보시스템(Clinical Decision Support System) 운영 전후 차이를 파악하기 위하여 시스템 적용 이전인 2020 년부터 2022 년까지 3 년간 뇌사추정자로 통보된 132 명의 환자와 시스템 적용 이후인 2023 년에 통보된 63 명의 환자정보를 수집하였다. 자료수집 시 통보된 뇌사추정자의 성별과 연령, 진료과, 통보경로, 통보자, 장기기증 연계를 변수로 설정하였고, 시스템 도입 전후 뇌사추정자 관련 특성간의 차이를 확인하기 위해 교차분석(카이제곱 검정)을 시행하였다. 전체 통보건수는 CDSS 적용 이후 39%증가하였고 실제 기증 가능한 뇌사추정자도 18%증가하였다. CDSS 도입 이전에는 연 평균 5.3 개의 진료과에서 통보가 진행되었고, CDSS 이후에는 연 평균 8 개 진료과에서 전산 및 유선통보를 시행한 것으로 나타났다. CDSS 적용 이전에는 40 세이상 65 세미만 그룹이 55%로 가장 높은 빈도를 보였으나, CDSS 적용 이후에는 65 세이상 그룹이 52%로 가장 높은 빈도를 보였으며($\chi2=16.730$, $p<0.001$), 상대적으로 고령에 해당하는 뇌사추정자의 통보 비율이 높아진 것으로 나타났다.
CDSS 도입 전후 통보경로는 전산통보가 62%에서 84%로 증가하였으며, 유선통보는 30%에서 13%로 감소, Rounding 발굴은 8%에서 3%로 감소하였다($\chi2=9.707$, $p=0.008$). 전산통보가 증가하며 진료과와 중환자실의 유선통보는 감소하였으며, 이는 24 시간 접근이 가능하고 업무 중 시각적으로 인지할 수 있는 전산통보 시스템이 뇌사추정자 통보에 더 많은 영향을 미친 것으로 볼 수 있다.
CDSS 적용 이후 통보 의료진을 분석한 결과 의사 통보가 20.5%에서 44.4%로 증가하였으며, 코디네이터 통보는 70.5%에서 55.6%로 감소하였다($\chi2=15.871$, $p<0.001$). 전산통보 시스템 이후 의사 직군 통보건이 증가하였고, 이는 전산상의 의무가 의료진의 인식에 영향을 미친 것으로 보여진다. CDSS 적용 이후 뇌사추정자의 장기기증 면담연계는 84%에서 93%로 증가하였으며, 장기기증 동의는 31%에서 36%로 증가하였다. 전산통보시스템을 통하여 발생 가능한 뇌사추정자가 24 시간 적극적으로 통보되었고, 특히 의사직군의 통보와 관심이 증가되었으며 이는 장기기증까지 연결되는 것으로 확인되었다. 향후 CDSS 의 효과분석을 통해 여러 변수가 있는 병원환경에서도 뇌사추정자를 지속적으로 발굴 수 있는 다양한 전략을 모색하여 시스템을 강화할 필요가 있다고 사료된다.

뇌사추정자특성_Table.jpg

[Table] 전산통보시스템 전후 뇌사추정자 특성간의 차이 (카이제곱 검정)

Variables	Total		pre-CDS		Post-CDS		p-value
	N	%	N	%	N	%	
Total (N=195)	195	100.0%	132	100.0%	63	100.0%	
Sex							
Male	125	64.1%	82	62.1%	43	68.3%	0.404
Female	70	35.9%	50	37.9%	20	31.7%	
Age group							
<40	34	17.4%	28	21.2%	6	9.5%	
40-65	97	49.7%	73	55.3%	24	38.1%	<0.001
65<	64	32.8%	31	23.5%	33	52.4%	
Notify route							
Telephone	47	24.1%	39	29.5%	8	12.7%	
EMR	135	69.2%	82	62.1%	53	84.1%	0.008
ICU Rounding	13	6.7%	11	8.3%	2	3.2%	
Notify staff							
Coordinator	128	65.6%	93	70.5%	35	55.6%	
Dotor	55	28.2%	27	20.5%	28	44.4%	<0.001
Others	12	6.2%	12	9.1%	0	0.0%	
Donation path.							
Consult							
Yes	61	31.3%	39	29.5%	22	34.9%	0.449
No	134	68.7%	93	70.5%	41	65.1%	
Consent							
Yes	50	25.6%	34	25.8%	16	25.4%	0.957
No	145	74.4%	98	74.2%	47	74.6%	
Complete							
Yes	37	19.0%	27	20.5%	10	15.9%	0.445
No	158	81.0%	105	79.5%	53	84.1%	

Abstract Submission No.: OP-0123

장기이식코디네이터의 on call 및 수당 보상체계에 대한 현황

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Objectives : 장기이식코디네이터는 장기이식센터에서 필수적인 역할을 수행하며, 높은 전문성이 요구되는 직무이다. 그러나 다양한 이유로 인해 장기이식코디네이터의 이직률이 증가하고 있어, 이를 해결하기 위한 조치가 필요하다. 현재까지 장기이식코디네이터의 on call 및 수당 보상 체계에 대한 신뢰할 만한 연구가 부족하므로, 본 연구를 통해 현재 보상 패턴을 조사하고, 이를 기반으로 효과적인 보상체계 마련을 위한 기초자료를 제시하고자 한다.
Methods : 이 설문 조사 연구는 KOTCO(대한장기이식코디네이터협회) 정회원 병원을 대상으로 장기이식코디네이터의 보상 시스템, on call 근무, KONOS Call, 및 인센티브를 조사하였으며, 총 70 개 병원 중 62 개 병원이 참여하여 설문지를 분석하였다.
Results : 62 개 병원 중 61 개 병원(98%)이 온콜 근무를 시행하고 있으며, on call 빈도는 2 주, 4 주마다 또는 365 일 다양하게 운영되고 있다. 16 개 병원(26%)이 on call(대기시간) 근무에 대한 수당이 제공하고 있으며, 보상 방식은 정액 지급, 일할 계산, 또는 주말 및 공휴일에 대한 별도 산정되어 지급되고 있다. KONOS call 수당을 받지 못하는 병원은 34 개 병원(55%)인 반면, 25 개 병원(40%)은 KONOS call 수당이 지급되고 있다. 또한, 5 개 병원(8%)은 이식 진행 시 인센티브를 제공하고 있으며, 5 개 병원(8%)은 장기 운송에 대한 위험 수당을 지급하고 있다. 일부 병원은 장기 기증에 참여하는 의료진게 연간 보험을 제공하는 예외적인 사례도 보고되었다.
Conclusions : 따라서 장기 이식 코디네이터의 on call 근무와 보상 체계에 대한 개선이 필요하다. 장기이식코디네이터의 on call 근무에 대한 적절한 보상과 인센티브를 마련하여, 이직률을 줄이고 경험 있는 코디네이터들이 장기적으로 근무할 수 있는 환경을 조성 할 필요가 있다. 장기 운송에 참여하는 의료진들에게 보험 보장을 제공하여, 이들의 노출 위험을 완화하고 직무에 대한 안정감을 제공할것을 제언한다. 이를 통해 장기이식코디네이터와 관련된 정책을 개선하고, 업무 환경을 향상시키는 데 기여할 수 있을 것을 기대한다.

Abstract Submission No.: OP-1003

장기이식코디네이터의 교육 및 상담 수가 생성의 경험

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Case Study : 나날이 발전하는 장기이식 현장에서 장기이식 코디네이터는 과연 얼마만큼의 역량을 발휘하며, 그 직무를 인정받고 있는지에 대한 논의가 2023 년부터 대한장기이식코디네이터협회(KOTCO)의 주요 화두였다. 이에 발맞춰 연장근무, 전화 수당과 함께 코디네이터의 교육 및 상담 수가에 대한 조사가 필요했다. 본 경험은 이 시기에 인천 소재 I 대학병원에서의 장기이식코디네이터의 교육 및 상담 수가를 생성한 경험으로 그 과정에서의 우리의 현실적 어려움과 앞으로 나아가야 할 방향을 공유하고자 한다. 이는 2024 년 6 월 심사팀의 행위수가 파트 관계자와의 첫 미팅을 시작으로 7 월 말 수가 생성 후 최초 적용까지 약 2 달이 소요되었다. 수가를 생성하는 첫 단계는 수가 생성의 근거를 찾는 것으로 이는 통상적으로 심사평가원의 급여 및 비급여 기준 중 해당사항을 확인한다. 2002 년 10 월 보건복지부의 급여 및 비급여 지침 중 No138. 대한임상간호사회의 신청으로 [장기이식 시 교육: 장기이식 관련 코디네이터가 실시한 경우 코디네이터 비용에 포함하여 비급여]가 검색되었다. 하지만, 이는 20 년 전의 자료이며, 비교적 최근인 2018 년 심사평가원의 심사기준인 고시 제 2018-193 호(행위) 중 [교육 및 상담료 급여 기준]을 보면 크게 4 가지의 대상 질환의 경우 요양 급여로 인정하는 내용을 확인하였다. 4 가지 대상 질환은 1)암환자 2)심장질환 3)장루 및 요루 4)만성신부전(투석)환자로 진료담당의사가 치료효과를 높이기 위하여 교육 필요성을 인정하는 경우에 급여로 인정되었다. 또한 교육팀으로 의사, 간호사, 영양사, 약사 등 관련 분야 상근 전문 인력으로 구성하며, 교육프로그램 전반을 관리하는 코디네이터 1 인 이상을 두어야 하며, 별도의 공간 확보와 3 개 이상의 직종 활용 및 총 교육시간 등을 명시하였다. 이 고시는 2017-118 호의 개정판으로 각 해당 질환의 의료진과 학회에서 꾸준히 노력한 결실이었으며, 교육자료도 관련 학회 등에서 제시한 표준 교육자료를 이용하여 교육팀, 교육의 내용, 횟수, 간격 등에 반영하도록 초안이 마련되었다. 고시 내용을 보면 장기이식 환자도 위 4 가지 질환의 경우와 같이 치료효과를 높이기 위해 이미 같은 조건으로 전문 교육이 시행되고 있으나, 급여 항목에 적용되지 않은 현실이 안타깝기만하다. 더욱이, 이식 환자뿐 아니라 이식 전 대기자 대상으로도 이식 전 상담을 전문적으로 시행하고 있다. 하지만 현실에서는 장기이식 교육 및 상담에 대한 급여 인정은 말할 것도 없거니와 도리어 대다수의 병원에서는 비급여 수가 생성도 없이 무료로만 시행되고 있는 것으로 조사되었다. 결론적으로 본원에서는 이 행위에 대한 근거로 [장기등 이식에 관한 법률 시행규칙 제 29 조(비용의 부담)법 제 42 조 제 2 항 단서에 따라 국민건강보험법에서 규정하지 아니한 장기등의 적출 및 이식에 드는 비용은 의료법 제 45 조 제 1 항에 따라 의료기관 개설자가 고지한 비급여 진료 비용에 따라 산출한다]는 법률에 근거하여 비급여 수가로 생성하였고, 장기이식 대기자에는 "이식을 위한 상담 및 교육", 장기이식 환자에게는 "이식 후 상담 및 교육" 수가를 적용하여 각각 6 만원, 10 만원으로 책정하였다. 이 과정의 경험을 공유함으로써 아직은 비급여 수가이시지만, 이 수가가 많이 생성되어 수요가 있다는 것이 증명되고, 향후 학회나 연구를 통해 교육의 필요성과 표준 가이드라인을 제시하여 심사평가원의 장기이식 코디네이터의 교육 및 상담료 급여 기준의 근거가 될 수 있도록 꾸준한 노력이 필요하다고 사료된다.

Abstract Submission No.: OP-0296

신장 기증 수술 후 다중 양식 통증 관리의 효과

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Objectives : 수술 후 적절한 통증 관리는 빠른 회복과 합병증 예방을 위해 매우 중요하다. 기존에는 마약성 진통제를 중심으로 통증을 조절했으나, 최근에는 다양한 기전을 가진 비마약성 약물을 병용하는 다중 양식(multimodal) 통증 관리로 변화하고 있다. 이 접근법은 마약성 진통제의 의존성과 부작용을 줄이면서, 비마약성 진통제의 조합을 통해 더 안전하고 효과적인 통증 관리를 가능하게 한다. 본 연구는 이러한 다중 양식 통증 관리 도입 전후의 효과를 비교하고자 한다.
Methods : 본 연구는 다중 양식 통증 관리 도입 전후를 비교하기 위해 후향적으로 분석하였다. 연구대상은 신장 기증 수술을 받은 총 170 명으로, 도입 전후 각각 85 명씩 포함되었다. 통증 점수는 NRS(Numeric Rating Scale)를 사용하여 평가하였고, PCA(자가 조절 진통제) 주입량과 PRN(필요 시) 마약성 진통제 사용 빈도를 분석하였다. 또한, 수술 전후 신장 기능의 변화를 평가하기 위해 크레아티닌 수치와 사구체 여과율을 통해 평가하였다.
Results : 다중 양식 통증 관리 도입 후, 수술 당일부터 수술 후 5 일까지 통증 점수는 도입 전 5.71, 4.52, 3.68, 3.06, 2.46, 1.37 점에서 도입 후에는 5.28, 4.02, 3.52, 2.94, 2.45, 1.71 점으로 나타나, 전반적으로 통증 점수가 낮아졌다. PCA 로 사용된 Fentanyl 의 주입량은 도입 전 1207.9±575.8 mcg 에서 도입 후 1285.9±724.3 mcg 으로 증가하였으나, PRN 마약성 진통제 사용은 크게 감소하였다. 특히, pethidine 사용은 총 34 건에서 2 건으로 줄어들였고, Tramadol 사용은 총 156 건에서 3 건으로 감소하였다. 신장기능은 도입 전후에 차이가 없었다.
Conclusions : 정규 아세트아미노펜과 비마약성 진통제를 조합한 다중 양식 통증 관리는 통증 감소에 효과적이며, 신장 기증자에서도 효과적이고 안전한 통증 관리 옵션이 될 수 있겠다.

Abstract Submission No.: PP-0248

Outcomes of Deceased Donor Kidney Transplantation According to K-KDPI: A Single-Center Experience

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Objectives : 신장 기증자 프로필 지수(KDPI)는 다양한 기증자 특성을 통합하여 신장이 이식에 적합한지 평가합니다. 대한민국은 2021 년 9 월 22 일부터 신장이식자 선정을 개선하기 위해 K-KDPI 를 채택하였으며, 이 연구는 사망 기증자 신장 이식의 결과를 분석하여 K-KDPI 의 임상적 성과를 평가하는 것을 목표로 합니다.
Methods : 본 후향적 단일기관 코호트 연구에는 서울대학교 병원에서 2021 년 9 월부터 2023 년까지 뇌사자로부터 신장을 이식받은 수혜자 총 107 명이 대상이며, 자료는 의무기록과 KONOS 데이터를 결합하여 분석하였습니다.
Results : 수혜자의 평균 연령은 47.8±19.2 세였고, 65 명(60.8%)이 남성이었습니다. 20 명(18.7%)의 환자가 불일치 기증자로부터 신장을 이식받았고, 66 명(61.7%)이 혈액투석을 받고 있었습니다. 말기 신질환의 가장 흔한 원인은 사구체신염(n=33, 30.8%)이었고, 그 다음으로 원인 불명(n=26, 24.3%), 당뇨병(n=17, 15.9%)이었습니다. 뇌사 기증자의 평균 연령은 43.6±20.2 세였고, 12 명(11.2%)의 확장 범주 기증자(ECD)가 있었으며, 이들의 평균 K-KDPI 점수는 39.7±25.0 이었습니다. 풀매치 기증자를 제외한 성인의 평균 대기 기간은 4173.3±1546 일이었고, 소아의 경우 718.6±604 일이었습니다. 성인과 소아 간의 대기 시간에는 유의미한 차이가 있었지만(t=-13.606, p=<.001), 수혜자의 혈액형별 대기 시간에는 차이가 없었습니다. 성인 수혜자의 이식 1 년 후 평균 eGFR 은 66.0±19.1mL/min 이었습니다. K-KDPI 점수는 eGFR 과 관련이 있었지만 (β = -.259, p= .001), eGFR 은 확장 범주자 기증자 상태에는 영향이 없었습니다. 연구 기간 동안 이식 편 손실은 3 건(2.8%)에서 발생했습니다.
Conclusions : K-KDPI 점수는 뇌사자 신이식 후 신장 기능과 관련된 요인이었습니다. 그러나 확장 범주 기증자의 상태는 단기적으로 eGFR 에 영향을 미치지 않았습니다. 보다 정확한 결과를 확인하려면 장기 추적 조사가 포함된 대규모 연구가 필요합니다.

Abstract Submission No.: OP-0269

단일 센터에서의 뇌사 간이식 선정 현황

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Objectives : 본 연구의 목적은 MELD 시스템 적용 후 단일 센터에서 뇌사자 간이식 선정 현황을 파악하여 뇌사자 간이식을 기다리는 환자들과 의료진에게 자료를 제공하고자 함이다.
Methods : 2016 년 6 월부터 2024 년 2 월까지 8 년 동안 뇌사 간이식대기자로 등록하였다가 간이식을 받은 14 세 이상의 환자들을 대상으로, 수혜자로 선정될 당시의 응급도, 혈액형 별 MELD 점수, 대기기간 그리고 입원 상태 등을 의무기록을 통하여 후향적으로 검토하여 분석하였다.
Results : 단일 센터에서 2016 년 6 월부터 2024 년 2 월까지 14 세 이상으로 뇌사 간이식대기자로 등록하여 간이식을 받은 환자는 565 명이었으며, 남자 397 명(70.3%), 여자 168 명(29.7%)이었다. 혈액형은 A+형 203 명(36.0%), B+형 137 명(24.3%), O+형 115 명(20.3%), AB+형은 110 명(19.4%)이었으며, 1 차이식이 435 명(76.9%), 재이식이 130 명(23.1%)이었다. 응급도 1 에서 뇌사 간이식대기자로 선정된 환자는 34 명으로 응급 기준에 따라 급성간부전이 20 예, 이식간기능부전이 10 예, 윌슨병에 의한 급성간부전이 4 예이었다. 선정 당시 MELD 점수는 최저 20 점에서 최고 40 점이었고, 평균 대기기간 3.6 일이었다. 응급도 2 이하에서 뇌사 간이식대기자로 선정된 환자의 MELD 점수는 15~40 점(평균 37.2 점)이었는데, 혈액형 별로는 A+형 28~40 점(평균 37.5 점)으로 2 등급(38~40 점)과 3 등급(31~37 점)에서 주로 선정되었고, B+형의 경우 29~40 점(평균 37.5 점)으로 2 등급과 3 등급에서 주로 선정되었고, O+형의 경우 33~40 점(평균 39 점)으로 2 등급에서 주로 선정되었으며 4 등급(21~30 점)에서 선정된 경우는 없었다. AB+형의 경우 21~40 점(평균 34.8)점으로 주로 2 등급과 3 등급에서 선정되었으며, 4 등급에서 선정된 경우도 24 명있었다. 응급도 상향 후 간이식까지의 대기시간은 평균 4.7 일 이었으며 원인질환은 알코올성간질환 182 예, B 형간염간경화 134 명예 재이식 130 예, 급성간부전 43 예, 나머지 76 예는 기타 진단이었다.
Conclusions : 뇌사 간이식대기자로 선정된 응급도 2 이하 환자의 MELD 점수는 평균 37.2 점으로 중증도가 높은 환자에서 선정되었고, 혈액형 별로는 O+ 형에서 점수가 가장 높았다. 원인 질환은 알코올성 간질환이 182 예로 가장 많았다. 혈액형에 따라 뇌사 간이식수혜자 선정 시 MELD 점수에 차이가 있으므로, 간이식코디네이터가 간이식대기자의 MELD 점수를 철저하게 업데이트하고 관리하여 간이식수혜자로 선정될 기회를 높이고, 간이식 수혜자들에게 원인 질환 재발 방지를 위한 교육을 꾸준히 시행하고, 혈액형 별로 선정 가능한 MELD 점수에 관한 정보를 의료진과 간이식대기자들에게 제공하는 것이 중요하다.

Abstract Submission No.: NP-0243

2024 년 의정갈등사태가 일 대학병원 생체신장이식 수술에 미친 영향

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Objectives : 2024 년 대한민국 의료계는 전공의 파업으로 촉발된 의정갈등 사태를 경험하며 큰 변화를 겪었다. 이 사태는 의료 전반에 걸쳐 영향을 미쳤고, 특히 고도의 전문성이 요구되는 생체신장이식 수술에 대한 우려가 대두되었다. 따라서 2024 년 의정갈등 사태가 생체신장이식 수술에 미친 영향을 보다 구체적으로 분석해보고자 한다.
Methods : 본 연구는 국내 일 대학병원에서 의정갈등 전 기간(2023 년 2 월 19 일 ~ 2023 년 8 월 5 일)과 의정갈등 후 기간(2024 년 2 월 19 일 ~ 2024 년 8 월 5 일) 신장이식 수술을 받은 군으로 구분하여 비교 분석하였다. 환자들의 의무 기록을 통해 확인한 신장이식 수술 건수, 혈액형 부적합 건수, 교차반응 양성 건수, 수술 준비 기간(검사 시작부터 수술 날짜까지 소요된 시간), 수술 준비 중 투석 시작 여부, 수술 후 입원 기간을 Chi-square test 와 Fisher's exact test, T-test 등을 사용하여 평가하였다.
Results : 분석 결과, 의정갈등사태 후 생체신장이식 수술 건수는 작년 동기간 대비 43.1% 감소한 것으로 나타났다 (n=65 vs. n=37). 이 중 혈액형 부적합 신장이식 수술이 감소하였는데 (n=21 vs n=8), 전체 신장이식 중 혈액형 부적합 신장이식이 차지하는 비율은 통계적으로 유의한 차이를 보이지는 않았으나(32.3% vs 21.6%, p=0.250), 1:128 이상의 high titer 군의 수술건수의 감소가 두드러졌다(52.4% vs 0%, p=0.012). 또한 신장이식 수술 준비 기간에도 변화가 있었으며(mean 91.58 vs 143.89, p<0.001), 수술 준비 중 투석을 시작해야 했던 환자의 비율도 증가한 것으로 나타났다(12.3% vs 29.7%, p=0.030). 반면 수술 후 입원기간에는 두 군간의 유의한 차이는 나타나지 않았다 (Mean 12.05 vs 11.70, p=0.743).
Conclusions : 본 연구에서 2024 년 의정갈등 사태가 생체신장이식 수술의 빈도와 준비 과정에 유의미한 영향을 미쳤음을 보여주었다. 의정갈등사태 이후 전체 수술 건수가 감소하였고 환자들의 신장 기능이 악화되어 이식 수술 전 투석을 시작하는 비율이 증가한 것이 확인되었다. 특히 혈액형 부적합 이식과 같은 고위험 수술의 감소는 의료진 부족으로 인해 고도의 기술적 전문성을 요구하는 절차가 원활하게 진행되지 못하였고 복잡한 치료를 받아야 하는 환자들에게 특히 더 큰 영향을 미쳤음을 시사한다. 이는 의료 시스템의 위기 상황이 고위험 수술에 미치는 심각한 영향을 반영하며, 이를 통해 의정갈등과 같은 의료 위기 상황에서 환자 관리와 의료서비스의 연속성을 유지하기 위한 효과적인 대응책을 모색하는 데 필요한 기초자료를 제공할 것으로 기대한다.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 9
(Kidney / Pancreas)

Abstract Submission No.: OP-0007

Initial Outcomes Of Deceased Donor Kidney Transplantation Using Hypothermic Machine Perfusion In Korea

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Objectives : Multiple studies have reported that hypothermic machine perfusion (HMP) shows better results in the preservation of the marginal donor than traditional static cold storage (SCS) methods. This study was performed to evaluate the effect of HMP by comparing short-term outcomes of patients who underwent deceased donor kidney transplantation using HMP and SCS.
Methods : There are ten patients with DDKT from 3/1/2022 to 12/31/2023. The renal grafts of six patients were preserved by SCS methods, and four grafts of patients were preserved by the HMP method. The characteristics of donors, recipients, and transplant process were compared between SCS and HMP groups, respectively. Delayed graft function (DGF) rate, post-operative 6-month graft and patient survival, and estimated glomerular filtration rate (eGFR) were compared in these two groups.
Results : The HLA mismatch of recipients was higher in the SCS group (5.17 ± 0.98) compared to the HMP group (3.25 ± 0.50) (p=0.007). There were no significant differences between the two groups in the donors' characteristics. The cold ischemia time (CIT) was significantly longer in the HMP group than in the SCS group (1095 vs 275 minutes, p=0.003). The DGF rate, 6-month graft survival, and patient survival were not statistically different. Additionally, short-term eGFR and serum creatinine levels did not show meaningful differences in these two groups. In the HMP group, the last renal resistance of all 4 patients at the end of HMP use were less than 0.4mmHg/mL/min, and the last flow rate were higher than 60 mL/min in all 4 patients.
Conclusions : HMP can be applied to the deceased donor kidney grafts with prolonged CIT with favorable short-term results and the HMP parameters including the renal resistance and flow rate are probably able to be used for the prediction of post-transplantation graft outcomes.

Table & Figure.jpg

	SCS group N=6	HMP group N=4	P value
Recipients			
Age	52.8 ± 7.83	51.5 ± 6.86	0.789
Sex			1.000
Male	6	4	
Female	0	0	
Cause of ESRD	HTN, DM, GN, IgAN	HTN, DM	
Duration of pre-transplant dialysis	6.50 ± 3.89	3.75 ± 4.86	0.348
Underlying disease	HTN, DM, RCC,	HTN, DM, RCC, hypothyroidism, Stroke	
ABO type	3A, 2B, 1AB	1AB, 3B	
HLA mismatch	5.17 ± 0.98	3.25 ± 0.50	0.007*
PRA (%)	6.33 ± 15.5	12.0 ± 24.0	0.659
EPTS (%)	53.8 ± 28.0	42.0 ± 18.1	0.481
Donor			
Age	44.7 ± 11.6	42.3 ± 16.2	0.789
Sex			1.00
Male	3	2	
Female	3	2	
Underlying disease	CVA, hypoxic brain damage, MI	Pneumonia, CVA, hypoxic brain damage, Endocarditis	
ABO type	3A, 1B, 1O, 1AB	1AB, 3B	
CRRT	0.50 ± 0.548	0.50 ± 0.577	1.000
K- KDPI (%)	37.5 ± 12.7	52.0 ± 24.5	0.250
Transplants			
WIT (minute)	44.2 ± 8.75	47.0 ± 2.94	0.556
CIT (minute)	**275 ± 204**	**1095 ± 427**	**0.003**

Table 1. Characteristics of recipients, donors, and the transplant process in both groups. (ESRD, end stage renal disease; HLA, human leukocyte antigen; PRA, panel reactive antibody; EPTS, estimated post-transplant survival; CRRT, continuous renal replacement therapy; K-KDPI, Korean Kidney Donor Profile Index; WIT, warm ischemia time; CIT, cold ischemia time).

	SCS group N=6	HMP group N=4	P value
DGF rate	0.167 ± 0.40	0.500 ± 0.47	0.312
6-Mo eGFR (mL/min/1.73m²)	53.5 ± 27.1	46.2 ± 12.6	0.633
6-Mo serum creatinine (mg/mL)	1.63 ± 0.64	1.66 ± 0.44	0.950
6-Mo Graft survival rate	100%	100%	1.000
6-Mo Patient survival rate	100%	100%	1.000

Table 2. It shows the short-term outcomes of both groups. Short-term outcomes were evaluated post-operative 6-month DGF rate, eGFR, serum creatinine levels, graft and patient survival rate. (DFG, delayed graft function; eGFR, estimated glomerular filtration rate).

Figure 1A

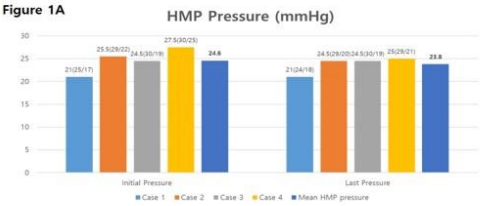

Figure 1A. Comparison between initial and last mean pressure of HMP group. It showed no statistical difference but showed a slight tendency to decrease (24.6 ± 2.72 mmHg of initial pressure and 23.8 ± 1.85 mmHg of last pressure, p=0.617). Mean pressure was calculated as (systolic pressure + 2 x diastolic pressure) / 3.

Figure 1B

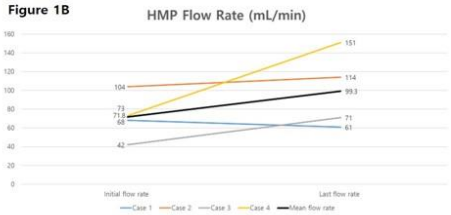

Figure 1B. Comparison between initial and last flow rate of HMP group. The black bold line showed no statistical difference but a tendency to increase (71.8 ± 25.4 mL/min of initial and 99.3 ± 41.5 mL/min of last flow rate, p=0.486).

Figure 1C

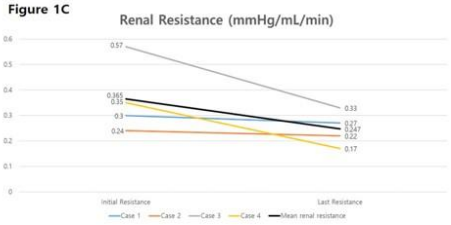

Figure 1C. Comparison between initial and last renal resistance of HMP group. The black bold line showed no statistical difference but a tendency to decrease (0.365 ± 0.144 mmHg/mL/min of initial and 0.247 ± 0.069 mmHg/mL/min of last renal resistance, p=0.200).

Abstract Submission No.: OP-0309

Graft And Recipient Outcome Of Kidney Transplantation On Female Recipients With Offspring Donor

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Objectives : This study aimed to evaluate the effect of having an offspring donor on graft outcome and patient survival among female kidney transplant recipients at the National Kidney and Transplant Institute from January 1, 2013, to December 31, 2022.
Methods : A retrospective cohort study was conducted involving 467 female kidney transplant recipients, comprising 77 with offspring donors and 390 with non-offspring donors. Baseline characteristics, immunologic risks, and post-transplant kidney function (serum creatinine and GFR) were compared. Patient and graft survival rates were also evaluated. Data analysis involved statistical comparisons using t-tests and chi-square tests where appropriate.
Results : Female recipients with offspring donors showed significantly higher rates of desensitization (25.97% vs. 8.93%, p=0.011) and presence of donor-specific antibodies (15.58% vs. 5.86%, p=0.011) compared to non-offspring donors. However, post-transplant kidney function trends showed no significant long-term differences between the groups, with similar mean GFR and serum creatinine levels observed from one month post-transplant onward. Survival analysis revealed no significant differences in <1-year, 1-2-year, and >3-year survival rates between the groups, indicating comparable patient and graft survival outcomes.
Conclusions : While offspring donors pose challenges related to immune sensitization, their use in kidney transplantation for female recipients does not compromise overall patient and graft survival rates. Tailored immunosuppressive strategies and meticulous monitoring of renal function are recommended to optimize outcomes in this context.

Abstract Submission No.: OP-0303

Cohort Profile: Study of Musculoskeletal Health in Renal Transplant (SMART), a Prospective Cohort Study

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Case Study : Renal transplant recipients often encounter musculoskeletal challenges such as osteoporosis and sarcopenia, which are linked to prolonged glucocorticoid use, physical inactivity, underlying medical conditions, and hormonal imbalances. Despite the evident impact of these issues on post-transplant outcomes, comprehensive studies investigating musculoskeletal health among renal transplant recipients are lacking. To address this gap, we have initiated the Study of MusculoskeletAl health in Renal Transplant (SMART) cohort. The SMART cohort aims to prospectively assess the longitudinal changes in various aspects of musculoskeletal health following renal transplantation. This involves assessing body composition through computed tomography, dual-energy X-ray absorptiometry, and bioimpedance analysis. Additionally, we will measure bone mineral density and muscle function using hand grip strength, 4-meter gait speed, jump power, and chair rise test. We will also evaluate participants' quality of life and biochemical parameters. A total of 401 renal transplant recipient participated in the SMART cohort at baseline from September 2020 to July 2023. Among them, 330 received transplants from living donors, while 71 received transplants from deceased donors. The cohort's average age was 50.5 years, with females comprising 42.6% of the participants. The SMART cohort boasts comprehensive muscle function assessments, quantifiable imaging datasets, and detailed information regarding immunosuppression. This initiative will provide valuable longitudinal data on musculoskeletal health in renal transplant recipients.

Abstract Submission No.: OP-0166

Validity of automatic diagnosis system for transplant kidney pathology : Comparison with diagnosis by pathologist

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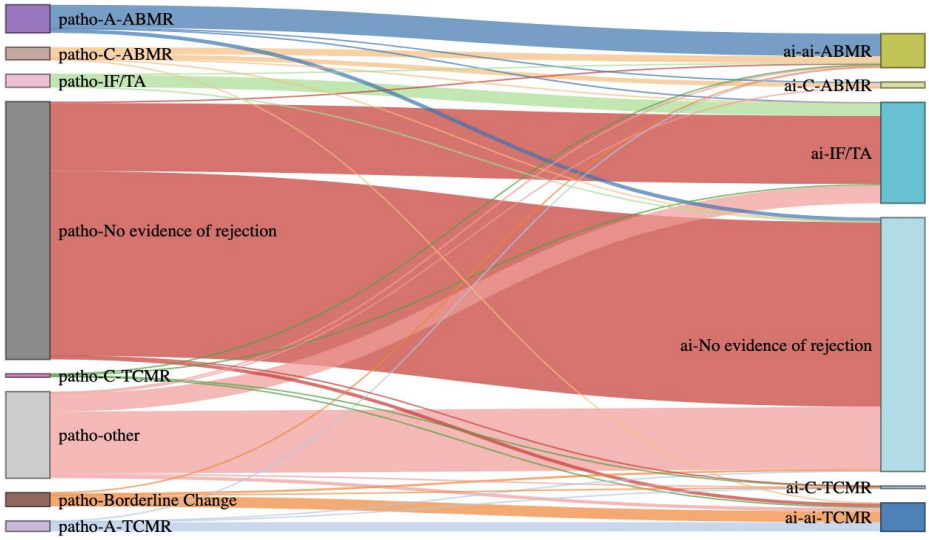
Objectives : Pathological evaluation of rejection is important in kidney transplant. Since 1991, the Banff classification has been the gold standard for pathological diagnosis. However, this classification has become complex over time, leading to misclassifications that can have deleterious therapeutic consequences for patients. Therefore, in order to standardize pathological diagnosis, AI that automatically performs pathological diagnosis based on Banff scores was announced at the 2022 Banff conference. This time, we evaluated the diagnostic ability of AI using our hospital's pathology database.
Methods : We evaluated the concordance rate of acute antibody mediated rejection (A-ABMR) diagnosis between AI and pathologists, using 1,017 transplant kidney biopsies (except for 0 hour biopsies) taken from 544 recipients at our hospital from January 2017 to July 2022. We also compared the survival time of A-ABMR cases diagnosed by AI and pathologists. Note that DSA information at the time of biopsy was not taken into consideration.
Results : There were 65 cases of A-ABMR diagnosed by pathologists (the period from transplant to biopsy 9.6±10.9 months), and 90 cases of A-ABMR diagnosed by AI (10.1±11.4). Pathologist and AI diagnosis were in agreement in 54 cases (6.8±8.9, average mvi score 3.3), and concordance rate was 83.1%. There were 11 cases in which the pathologist alone diagnosed A-ABMR (5.0±4.7, 1.2), and there were no cases of renal failure. There were 36 cases AI alone diagnosed A-ABMR (15.2±12.8, 2.8), of which 2 cases resulted in renal failure.
Conclusions : It is possible that the survival rate can be increased by using AI in addition to pathologist's diagnosis.

Screenshot 2024-04-19 at 22.58.34.png


patho-A-ABMR
patho-C-ABMR
patho-IF/TA
patho-No evidence of rejection
patho-C-TCMR
patho-other
patho-Borderline Change
patho-A-TCMR
ai-ai-ABMR
ai-C-ABMR
ai-IF/TA
ai-No evidence of rejection
ai-C-TCMR
ai-ai-TCMR

Abstract Submission No.: OP-0280

Sodium-Glucose Cotransporter 2 Inhibitors Reduce the Rate of Decline in the Estimated Glomerular Filtration Rate of Kidney Transplant Patients with Recurrent or De Novo Glomerulonephritis

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Objectives : Although recurrent or de novo glomerulonephritis (GN) after kidney transplantation (KT) is one of the main causes of renal allograft failure, no effective treatment is currently available. Recent evidences indicate the beneficial effects of sodium-glucose cotransporter 2 inhibitors (SGLT2i) in delaying the progression of a broad range of chronic kidney diseases, including GN.
Methods : Twenty-seven patients with biopsy-proven GN of the renal allograft were treated with SGLT2i at a median of 16.3±8.4 years post-transplant and were prospectively followed. IgA nephropathy was the most common (n=18), followed by focal segmental glomerulosclerosis, membranous nephropathy, and minimal change disease (n=2 each), and others (n=3). The baseline mean eGFR was 57±26 mL/min/1.73 m². Baseline mean urine protein-creatinine ratio (U-PCR) was 689±536 mg/g. The primary outcome was the change in proteinuria from baseline to 6 and 12 months, and the change in the eGFR slope before (-12 to 0 months) and after (3 to 15 months) the initiation of SGLT2i. The secondary outcomes were changes in body weight (BW), systolic blood pressure (SBP), and doses of antihypertensives. Adverse reactions were closely monitored.
Results : The post-SGLT2i follow-up period was 23.9 (median) ±15.0 months. The eGFR slope improved from -5.67±7.77 ml/min/1.73 m²/year [before SGLT2i] to -0.38±17.19 [after SGLT2i] (P=0.006, paired t-test). The U-PCR did not change significantly. BW decreased significantly at 3 months and was maintained thereafter. SBP did not change significantly, but the number of antihypertensives decreased. There were no cases of acute pyelonephritis, acute kidney injury, or other adverse reactions attributable to SGLT2i.
Conclusions : SGLT2i slowed the decline in eGFR in patients with GN of the renal allograft and was well-tolerated. Our preliminary results warrant confirmation by further studies with a larger number of patients and prolonged follow-up.

Abstract Submission No.: OP-0371

Optimizing Rituximab Dosing: Impact on B-cell Depletion and Clinical Outcomes in ABO-Incompatible Kidney Transplantation

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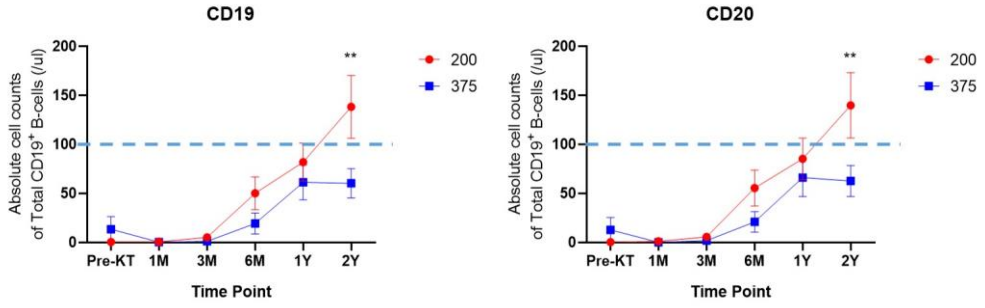
Objectives : Despite the increasing number of patients awaiting kidney transplants, the shortage of deceased donor kidneys has brought ABO-incompatible kidney transplantation (ABOi KT) to the forefront as an alternative. Rituximab, a key immunosuppressive agent of ABOi KT, has been associated with increased infection risks depending on dosage. This study evaluates the potential of using low-dose rituximab to balance immunosuppression with reduced complication rates.
Methods : A retrospective study was conducted on ABOi KT patients who underwent transplantation between 2010 and July 2022. Patients were divided into two groups: a low-dose rituximab group (200 mg, N=22) and a high-dose rituximab group (375 mg/m², N=22). Clinical data and blood samples were collected for analysis, focusing on B-cell depletion, anti-ABO antibody reduction, and the incidence of infections and rejection. Although rejection rates were challenging to compare directly due to dosage determination based on antibody titer, B-cell depletion and other outcomes were assessed using flow cytometry.
Results : Both the low-dose and high-dose groups showed effective antibody reduction, with no significant difference in rejection risk. Flow cytometry revealed that CD19+ and CD20+ cells were fully depleted in both groups up to 3 months post-transplant. However, the low-dose group showed B-cell repopulation by 6 months, returning to normal levels by 1 year. In contrast, the high-dose group had lower B-cell repopulation levels, remaining at a minimal level even 2 years post-transplant.
Conclusions : Accommodation in ABOi KT is known to occur within the first month, and a single low dose of 200 mg rituximab is sufficient to maintain B-cell depletion during this period. High-dose rituximab may lead to prolonged B-cell depletion, increasing the risk of infections. This study provides valuable insights into optimizing rituximab dosing in ABOi KT, balancing efficacy with safety.

figure 1.jpg



Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 10
(Liver)

Abstract Submission No.: OP-0366

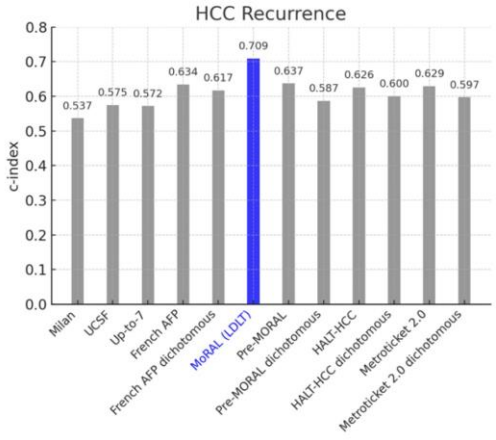
Comparative Validation of Prediction Models for Hepatocellular Carcinoma Outcomes in Living Donor Liver Transplantation Cohort: Superiority of Tumor Markers to Imaging Study

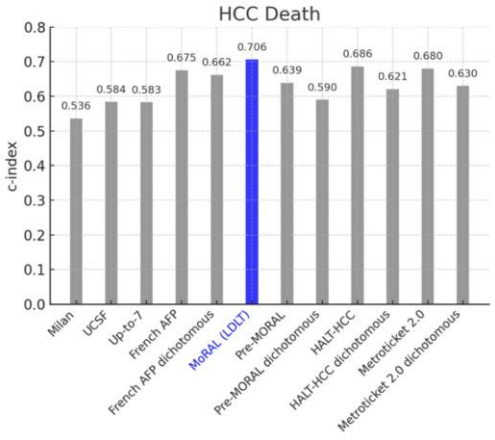
Deok-Gie Kim, Hwa-Hee Koh, Minyu Kang, Eun-Ki Min, Jae Geun Lee, Dong Jin Joo, Myoung Soo Kim
Department of Liver Transplantation and Hepatobiliary Surgery, Severance Hospital, Korea, Republic of

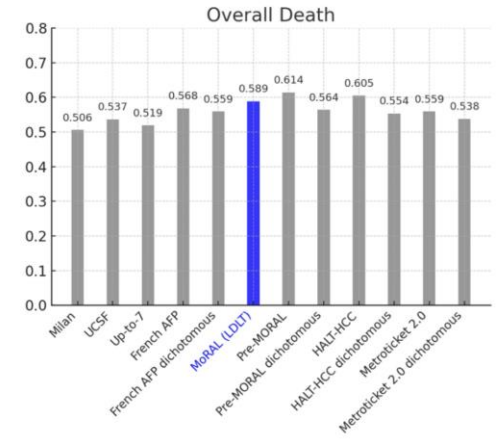
Objectives : Living donor liver transplantation (LDLT) could provide timely curative treatment for unresectable hepatocellular carcinoma (HCC). This study performed comparative validation of various prediction models for HCC outcomes in LDLT population
Methods : For 488 patients who underwent LDLT for HCC, pretransplant imaging studies assessed by modified RECSIT criteria, tumor markers such as alpha feto-protein (AFP) and protein induced by vitamin K absence or antagonist-II (PIVKA II), and explant pathology were recruited. C-index of models for the HCC outcomes were compared, followed by further investigation for the predictive performances of the best model.
Results : Among prediction models, MoRAL (11 *Square root-PIVKA II + 2*Square root-AFP) showed higher C-index for HCC recurrence than the others, which included radiologic viable tumor number and/or size (MoRAL:0.709, Milan:0.537, USCF:0.575, Up-to-7:0.572, French AFP:0.634, Pre-MORAL:0.637, HALT-HCC:0.626, Metroticket2.0:0.629). MoRAL also had the highest C-index for HCC-specific death (0.706). MoRAL showed linear correlation with HCC recurrence on the adjusted spline curve. Five-year HCC recurrence was well-stratified when patients were divided into three groups by MoRAL cut-offs (11.9% for MoRAL<100, 29.6% for MoRAL 100-200, and 48.6% for MoRAL>200, P<0.001). However, patients who had major vessel invasion or portal vein tumor thrombus showed similarly high HCC recurrence rate regardless MoRAL (78.3% for MoRAL<100, 78.6% for MoRAL 100-200, and 69.2% for MoRAL>200, P=0.612)
Conclusions : MoRAL, the tumor marker based model, showed the best predictive performance for HCC recurrence and HCC-specific death compared to other models including pretransplant radiologic tumor burden, except in case of major vessel invasion or portal vein tumor thrombus.

hccmodel.jpg

Predictive power of various prediction models for HCC outcomes after LDLT







Abstract Submission No.: OP-0404

The availability of 3D-VR images to visualize the post-implantation area in dual-graft living donor liver transplantation

Seiichi Shimizu, Masahiro Ohira, Ichiya Chogahara, Ryosuke Nakano, Hiroshi Sakai, Hiroyuki Tahara, kentaro Ide, Yuka Tanaka, Tsuyoshi Kobayashi, Hideki Ohdan
Department of Department of Gastroenterological and Transplant Surgery, Hiroshima University, Japan

Objectives : Dual-graft LDLT (DG-LDLT) has been established and reported mainly in the Republic of Korea and other Asian countries. In DG-LDLT, bile duct (BD) anastomosis is difficult to achieve because the right-sided graft (RSG) was rotated 180° along the sagittal axis. This study aimed to demonstrate the availability of 3-dimensional virtual reality (3D-VR) images in DG-LDLT.
Methods : Three cases of DG-LDLT were performed at Hiroshima University Hospital in 2023 and 2024. 3D-VR images were reconstructed from preoperative CT scans by Holoeyes MD®. We reviewed the optimal operational procedures and the availability of 3D-VR images in DG-LDLT.
Results : Based on the reconstructed 3D-VR images, we imaged that the hepatic hilar of RSG could be slightly moved dorsal to caudal to perform the BD anastomosis after the portal vein (PV) and hepatic artery (HA) anastomosis. Three cases of DG-LDLT were performed using two left lobe grafts. GRWR of each case was 0.77 and 0.44, 0.63 and 0.51, and 0.66 and 0.58, respectively. On the back table, the hepatic veins of the graft were unified into a single orifice with great saphenous veins in both grafts. The PV and HA of the RSG were elongated using the great saphenous vein based on the 3D-VR images. After portal reperfusion and hepatic artery anastomosis of the left-side graft, we started to anastomose each vessel of the RSG. The warm ischemic time of each case was 21 and 25 minutes, 21 and 27 minutes, and 23 and 25 minutes, respectively. The BD could be reconstructed through duct-to-duct anastomosis or hepaticojejunostomy after vessel reconstruction. Although all patients had episodes of surgical complications, all patients survived and were doing well in the postoperative course.
Conclusions : DG-LDLT can expand the donor pool without additional donor risks. The 3D-VR images could be useful for positioning the RSG considering performing BD reconstruction after vessel reconstruction.

Abstract Submission No.: OP-0068

Clinical Outcomes of 90 cases of Post-Transplant Lymphoproliferative Disorder (PTLD) After Liver Transplantation: A 24-years Single- Center Experience

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Objectives : Post-Transplant Lymphoproliferative Disorder (PTLD) is a rare but serious complication following solid organ transplantation(SOT) with a mortality rate of approximately 50%. The timing of PTLD onset may affect clinical characteristics and overall prognosis; however, data specifically focusing on liver transplantation (LT) are limited due to its low incidence. This study aims to investigate the clinical characteristics and outcomes of PTLD in LT recipients.
Methods : Between January 2000 and December 2023, LT recipients diagnosed with PTLD at Asan Medical Center were retrospectively reviewed. PTLD diagnoses were pathologically confirmed, and patients were categorized as early onset or late onset based on the timing of diagnosis post-transplantation. Study endpoints included complete remission (CR) rates and patient survival.
Results : Of the 8,351 LT recipients, 90 developed PTLD, with 24 (26.6%) classified as early onset and 66 (73.4%) as late onset. Early onset PTLD was more common in pediatric (45.8% vs 15.2%, p=0.004). Monomorphic PTLD was the most frequent subtype (58.3% vs 75.8%). The mean time to PTLD diagnosis was shorter in the early onset group (5.5 ± 3.05 vs 83.86 ± 61.19 months, p<0.001). EBV detection in biopsy was more frequent in early onset PTLD (75.0% vs 49.2%, p=0.033). CR rates were 41.7% in early onset and 37.9% in late onset PTLD (p=0.809). Overall mortality rates were similar between the groups.(41.7% vs 37.9%, p=0.809). Age ≥60 years (HR 4.492, CI 2.084-9.681, p<0.001), elevated serum LDH (HR 2.577, CI 1.182-5.620, p=0.017), and performance status (PS) ≥2 (HR 2.654, CI 1.194-5.900, p=0.017) were significant risk factors for overall survival.
Conclusions : Early and late onset PTLD in LT recipients demonstrate different clinical features, but have similar long-term outcomes. In LT, Age, serum LDH levels, and performance status at diagnosis are key prognostic factors for PTLD.

Abstract Submission No.: OP-0378

Liver Transplantation For Combined Hepatocellular-Cholangiocarcinoma: Exploring New Frontiers

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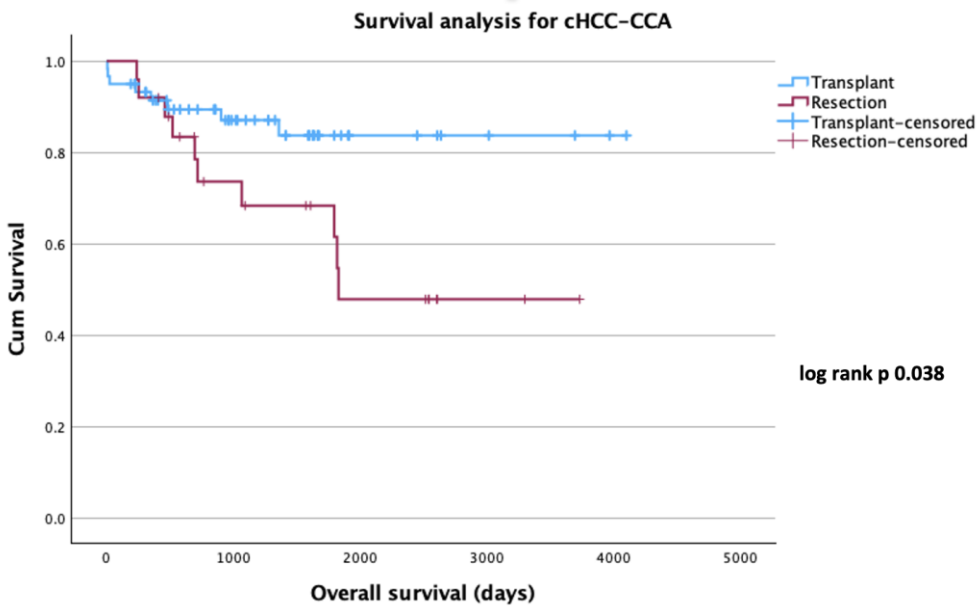
Objectives : Combined hepato cellular-cholangiocarcinoma (cHCC-CCA) is a heterogenous tumor exhibiting the neoplastic traits of both hepatocellular carcinoma (HCC) and cholangiocarcinoma (CCA). Despite being rare, due to its unique biology and clinical behaviour, cHCC-CCA is gaining increasing attention. The management of cHCC-CCA is not yet standardised. Tumor recurrence is frequent and 5-year survival rates do not exceed 30% following resection. The role of transplantation is not clearly understood. We aimed to study the oncological and survival outcomes of resection versus transplantation for cHCC-CCA and to determine the efficacy of liver transplantation for this tumor.
Methods : We retrospectively analysed all patients with a histologically proven diagnosis of cHCC-CCA, who underwent resection or transplantation at our centre between 2010 and 2023. Statistical analysis was done to identify risk factors and to compare survival outcomes between the two treatment modalities.
Results : A total of 85 patients were identified, out of which 25 (29.5%) underwent resection and 65 (70.5%) underwent transplantation. Kaplan Meier analysis (figure 1) showed that transplanted patients have a significantly longer overall (86.6% vs 60%, log rank p 0.038) and recurrence free (91.7% vs 52%, log rank p <0.001) survival. 1, 3 and 5 year survival rates (transplant versus resection) were 93.3% vs 92% , 88.3% vs 72% and 86.6% vs 60% respectively. On subgroup analysis, this survival advantage was maintained for tumors within UCSF criteria (p 0.042), however, no difference was observed once the tumors crossed UCSF (p 0.468). The recurrence rate was significantly higher following resection when compared to transplantation (48% vs 8.3%, p <0.001). Cox-regression analysis showed that macrovascular invasion was a significant risk factor for recurrence following transplantation (p 0.011, HR 39.62, CI 2.35-666.16) in our cohort.
Conclusions : Liver transplantation is an effective treatment option for cHCC-CCA, and significantly improves overall and recurrence free survival in selective patients without macrovascular invasion.

Figure 1.png


Survival analysis for cHCC-CCA
Cum Survival
1.0
0.8
0.6
0.4
0.2
0.0
0
1000
2000
3000
4000
5000
Overall survival (days)
Transplant
Resection
Transplant-censored
Resection-censored
log rank p 0.038

Abstract Submission No.: OP-0178

The Expression Of Senescent Cells In The Liver Graft Following Hypothermic Oxygenated Machine Perfusion

Kazushige Migita, Akihiko Soyama, Ayaka Satoh, Yuta Kawaguchi, Takashi Hamada, Takanobu Hara, Hajime Matsushima, Tomohiko Adachi, Kengo Kanetaka, Susumu Eguchi
Department of Liver Transplantation and Hepatobiliary Surgery, Department of Surgery, Nagasaki University Graduate School of Biomedical Sciences, Japan

Case Study : 【Background and Aims】 Static Cold Storage (SCS), a widely used preservation method for transplantable organs, has been reported to increase the number of senescent cells which have stopped the cell cycle. This study aimed to investigate whether hypothermic oxygenated machine perfusion (HOPE) could inhibit the development of senescent cells during the graft preservation. 【Methods】 Liver grafts were procured from 30 kg female domestic pigs in accordance with clinical protocol to procure the liver graft from brain-dead donor. The grafts were then divided into two groups: SCS group and SCS + HOPE group (N=2 per group). We compared the chronological expression and localization of senescent cell markers (p21, γH2AX, and LaminB1) in the liver parenchyma and common bile duct until 1, 3 , 5 ,7 hours after the procurement. Expression levels were assessed by immunostaining, and the ratio of positive cell area to total cell area was calculated in one field of view (liver parenchyma: 200x, common bile duct: 400x) across 10 fields of view for comparison. 【Result】 In the liver parenchyma, p21 and γH2AX expression increased over time in both SCS and SCS + HOPE groups, while LaminB1 expression decreased over time in both groups. Notably, SCS + HOPE group showed a significant reduction in p21 and γH2AX positive cells compared to SCS group in SCS5h vs SCS1h + HOPE4h (p21: 13.3% vs 3.78%, $p<0.001$; γH2AX: 13.19% vs 2.99%, $p<0.001$). In the peribiliary glands (PBG) of the common bile duct, p21 and γH2AX were highly expressed in both groups, with no significant differences observed. 【Conclusion】 The SCS group exhibited increased senescent cell expression associated with cytotoxicity, whereas SCS +HOPE group demonstrated a suppression of senescent cell expression, likely due to the organ-protective effects of HOPE.

Abstract Submission No.: OP-0265

Laparoscopic Donor And Recipient Explant Hepatectomy in Living Donor Liver Transplantation: A Vietnamese Center Experience

Van Thanh LE[2], Van Quang VU[2], Trung Hieu LE[2], Thi Hien NGUYEN[2], Van Anh NGUYEN[2], **Anh Van LE**[1]
[1]Department of Human Organ and Tissue Transplant Center, 108 Military Central Hospital, Vietnam
[2]Department of HBP Surgery, 108 Military Central Hospital, Vietnam

Objectives : Laparoscopic donor and recipient explant hepatectomy in living donor liver transplantation has been successfully performed in a few high-volume centers around the world, proving feasibility, safety, fast recovery, and aesthetics for liver donors and recipient.
Methods : We reported 27 first cases of pure laparoscopic donor hepatectomy and 8 cases underwent total laparoscopic explant hepatectomy in Vietnam performed at Department of Hepatopancreato-biliary Surgery at 108 Military Hospital from November 2017 to December 2023.
Results : In 27 donors, the mean operative time was 255,3 minutes, mean time for parenchyma resection was 71,6 minutes, mean blood loss was 245,3 mL. The patients were followed up for 3-20 months after surgery, complication rate was witnessed in 3 cases (11,1%), all of which were biliary leak, managed successfully with percutaneous drainage in 2 cases and reoperation in 1 case. In 8 recipients, mean time for laparoscopic explant hepatectomy 120,5 minutes. We noted no complication related with laparoscopic phase.
Conclusions : Our short-term outcome of pure laparoscopic donor hepatectomy proved this technique as a feasible and safe strategy for liver living donor and laparoscopic explant hepatectomy is indicated in selected recipients only.

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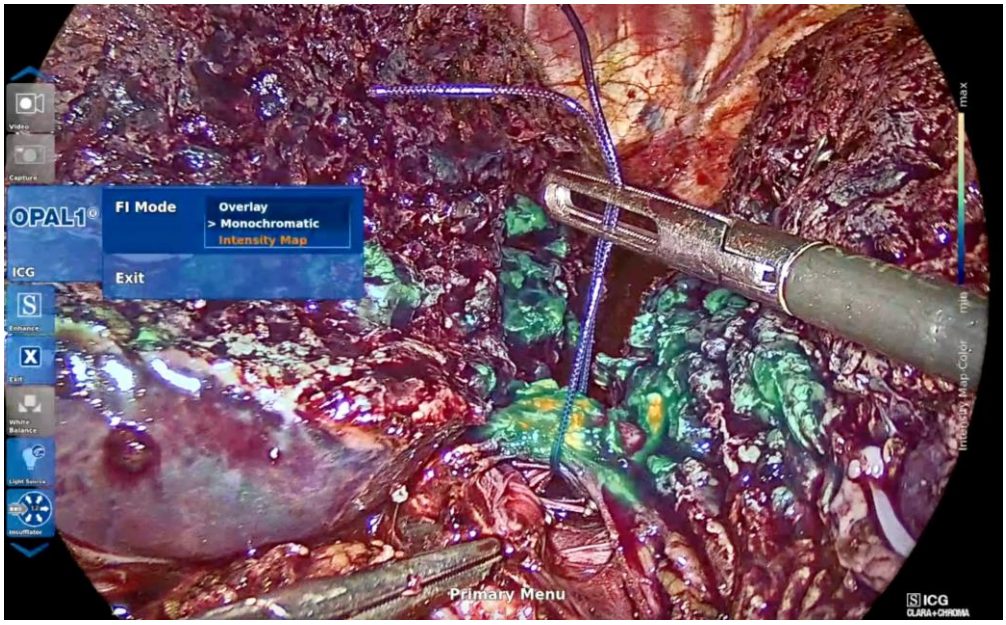
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Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 11
(Donation)

Abstract Submission No.: OP-0290

Enhanced Prediction of Renal Function Post-Nephrectomy Through AI-Driven Preoperative Volumetric Analysis

Eun-Ah Jo[1], Juhan Lee[3], Sangwan Kim[4], Kim Jin Sung[5], Ahram Han[2], Jongwon Ha[2], Yong Chul Kim[6], Sangil Min[2]
[1]Department of Surgery, Division of Transplant Surgery, Chung-Ang University Hospital, Korea, Republic of
[2]Department of Surgery, Division of Transplant Surgery, Seoul National University College of Medicine, Korea, Republic of
[3]Department of Surgery, Division of Transplant Surgery, Severance Hospital, Korea, Republic of
[4]Department of Health Policy and Management, Seoul National University College of Medicine, Korea, Republic of
[5]Department of Radiation Oncology, Severance Hospital, Korea, Republic of
[6]Department of Nephrology, Seoul National University College of Medicine, Korea, Republic of

Objectives : Predicting postoperative renal function in living kidney donors is critical for ensuring long-term donor safety. Current models, however, do not fully exploit the potential of advanced imaging data. This study addresses this gap by developing an artificial intelligence (AI)-based model that utilizes preoperative kidney volumetry to improve predictions of renal function following nephrectomy.
Methods : Analyzing data from 1,854 living kidney donors from three tertiary hospitals (2010-2020), we developed and validated an AI model to measure kidney cortex volume from pre-donation CT images. This volumetry and other preoperative factors were integrated with various machine learning algorithms to predict one-year post-donation estimated glomerular filtration rate (eGFR). Model performance was compared using metrics such as mean absolute error (MAE), R-squared (R^2), and root mean square error (RMSE).
Results : The AI segmentation model demonstrated high accuracy with a Dice similarity coefficient of 0.97 and a Hausdorff distance of 0.76 mm. Predictive models incorporating volumetric measurements notably improved the accuracy of estimating one-year post-nephrectomy glomerular filtration rates. The highest predictive accuracy was achieved with the generalized additive model (GAM) in the external validation cohort (R^2 = 0.63), while the CatBoost model exhibited the lowest MAE and RMSE in both internal and external validation cohorts (MAE = 7.70 and 7.43; RMSE = 9.70 and 9.60).
Conclusions : This study highlights the critical role of preoperative kidney cortex volume in the donor assessment process. Inclusion of donor kidney volume significantly improved the predictive function. Furthermore, machine learning models captures complex nonlinear relationships between factors to provide a comprehensive and personalized risk assessment.

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Figure 1. Living kidney donor's (A) manually segmented kidney cortex and (B) auto-segmented kidney cortex.

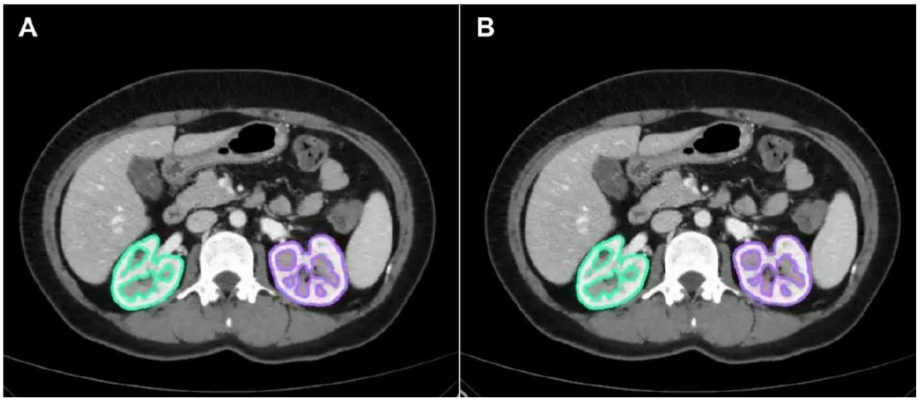

Table 1. Comparison of the different prediction models

	Training Set Validation						Internal Test						External Test					
	GAM	Poisson	ExtraTrees	XGB	GB	CB	GAM	Poisson	ExtraTrees	XGB	GB	CB	GAM	Poisson	ExtraTrees	XGB	GB	CB
Exclusion of RKV Variable																		
MAE	7.97	7.93	7.79	7.89	7.85	7.88	8.58	8.61	8.53	8.29	8.54	8.17	7.73	7.64	7.61	7.55	7.84	7.79
R^2	0.60	0.59	0.59	0.59	0.59	0.59	0.61	0.55	0.56	0.58	0.55	0.58	0.62	0.49	0.51	0.50	0.48	0.47
RMSE	10.19	10.15	10.06	10.14	10.10	10.08	10.51	10.58	10.38	10.19	10.48	10.12	9.81	9.79	9.66	9.72	9.95	10.00
Inclusion RKV Variable																		
MAE	7.38	7.28	7.33	7.29	7.21	7.23	7.97	7.84	7.82	7.94	7.88	7.70	7.33	7.26	7.27	7.76	7.55	7.43
R^2	0.65	0.64	0.64	0.64	0.64	0.64	0.65	0.61	0.62	0.60	0.61	0.62	0.63	0.55	0.54	0.48	0.49	0.52
RMSE	9.45	9.43	9.46	9.47	9.39	9.38	9.81	9.75	9.69	9.93	9.78	9.70	9.37	9.30	9.35	9.99	9.83	9.60

GAM, generalized additive model; XGB, extreme gradient boost model; GB, gradient boost model; CB, CatBoost model; MAE, mean absolute error; RMSE, Root mean square error; RKV, remnant kidney volume

Abstract Submission No.: OP-0383

Feasibility of Pure Laparoscopic Donor Right Hepatectomy Compared to Open Donor Right Hepatectomy: A Large Single-Center Cohort Study

Sang-Hoon Kim, Ki-Hun Kim, Sung-Gyu Lee, Shin Hwang, Chul-Soo Ahn, Deok-Bog Moon, Tea-Yong Ha, Gi-Won Song, Dong-Hwan Jung, Gil-Chun Park
Department of Liver Transplantation and Hepatobiliary Surgery, Asan Medical Center, Korea, Republic of

Objectives : Large cohort studies comparing pure laparoscopic donor right hepatectomy (PLDRH) and open donor right hepatectomy (ODRH) are rare. This study aimed to compare the safety of living donors after PLDRH and ODRH. Since the initial success of the PLDRH, a notable increase has occurred in the number of transplant centers adopting this approach. However, the complexity thereof presents particular technical challenges regarding the procedure, donor safety, and graft viability.
Methods : This retrospective cohort study included 3348 consecutive living donors who had undergone PLRDH (n= 329) and ODRH (n= 3019), between January 2014 and August 2023, at Asan medical center, Seoul. Donor complications were assessed, as per the Clavien–Dindo (CD) classification. Multivariate logistic regression analyses were performed to identify statistically significant factors correlated with major (CD grade III or IV) and biliary complications, which included bile leakages and biliary strictures.
Results : The PLRDH cohort revealed lower incidence rates of 30-day overall, major, and biliary complications than the ODRH cohort. After propensity score matching, the PLRDH cohort had less overall and biliary complications than the ODRH cohort; however, no statistically significant differences were observed in the major complications. Statistically significant independent risk factor correlated with major and biliary donor complications was the multiple portal vein (PV) openings.
Conclusions : The findings of this large cohort study revealed that PLRDH has the potential to become a standard procedure for the retrieval of right liver grafts from living donors.

Table.png

Table 1. Baseline characteristics of study population

Variables	Before PSM		p	After PSM		p
	PLDRH (n = 329)	ODRH (n = 3019)		PLDRH (n = 314)	ODRH (n = 314)	
Sex, female	188 (57.1)	1025 (33.9)	<0.001	174 (55.4)	183 (58.3)	0.468
Age, year	28.9±7.4	30.1±8.9	0.011	28.9±7.4	29.2±9.1	0.542
BMI, kg/m²	22.4±2.9	23.4±3.1	<0.001	22.5±2.8	22.5±2.9	0.997
Preoperative steatosis ≥ 20%	5 (1.5)	146 (4.8)	0.006	5 (1.6)	11 (3.5)	0.129
Graft type, n			0.065			0.881
Modified right lobe	10 (3.0)	149 (4.9)		302 (96.2)	302 (96.2)	
Modified-extended right lobe	2 (0.6)	58 (1.9)		2 (0.6)	3 (1.0)	
Extended right lobe	318 (96.4)	2811 (93.1)		10 (3.2)	9 (2.9)	
Graft weight	674.5±106.0	746.8±198.0	<0.001	679.8±104.1	648.5±123.1	0.001
Graft anatomy						
Portal vein openings			<0.001			0.794
1	322 (97.6)	2743 (90.9)		306 (97.5)	307 (97.8)	
2	8 (2.4)	267 (8.8)		8 (2.5)	7 (2.2)	
3	0	8 (0.3)		0	0	
Hepatic artery openings			0.036			0.254
1	325 (98.5)	288 (95.5)		309 (94.8)	312 (99.4)	
2	5 (1.5)	134 (4.4)		5 (1.6)	2 (0.6)	
3	0	2 (0.1)		0	0	
Middle hepatic vein openings			0.010			0.040
≤3	2769 (91.7)	249 (8.3)		278 (88.5)	260 (82.8)	
≥4	289 (87.6)	41 (12.4)		36 (11.5)	54 (17.2)	
Inferior right hepatic vein openings			0.168			0.417
0	192 (58.2)	1601 (53.1)		181 (57.6)	174 (55.4)	
1	105 (31.8)	1026 (34.0)		101 (32.2)	98 (31.2)	
2	26 (7.9)	346 (11.5)		25 (8.0)	37 (11.8)	
≥3	7 (2.1)	43 (1.4)		7 (2.2)	5 (1.6)	
Bile duct openings			0.011			0.174
1	223 (67.6)	1775 (58.8)		246 (78.3)	243 (77.4)	
Double-barrel	36 (10.9)	348 (11.5)		62 (19.7)	69 (22.0)	
2	65 (19.7)	2 (27.8)		6 (1.9)	1 (0.3)	
≥3	6 (1.8)	56 (1.9)		0	1 (0.3)	
Intraoperative transfusion, n	0	0	-	0	0	-
Warm ischemic time, min	13.4±6.2	5.5±2.8	<0.001	13.1±5.4	5.7±2.1	<0.001
Operation time, min	447.4±141.4	392.8±111.1	<0.001	451.3±143.7	394.3±123.2	<0.001
Postoperative outcomes						
Peak total bilirubin, mg/dL	2.8±1.3	2.9±1.9	0.680	2.9±2.0	2.8±1.3	0.449
Peak AST, IU/L	282.4±162.6	236.5±123.0	<0.001	285.2±164.5	224.3±96.1	<0.001
Peak ALT, IU/L	330.6±177.9	268.1±139.6	<0.001	333.0±179.4	255.6±120.1	<0.001
30-day complication, Clavien-Dindo classification			0.029			0.180
I	0	26 (0.9)		0	3 (1.0)	
II	1 (0.3)	20 (0.7)		1 (0.3)	3 (1.0)	
IIIa	1 (0.3)	41 (1.4)		1 (0.3)	4 (1.3)	
IIIb	1 (0.3)	21 (0.7)		1 (0.3)	2 (0.6)	
IV	0	0		0	0	
30-day overall complication	3 (0.9)	108 (3.6)	0.010	3 (1.0)	12 (3.8)	0.019
30-day major complication	2 (0.6)	62 (2.1)	0.037	2 (0.6)	6 (1.9)	0.155
30-day biliary complication	0	29 (1.0)	0.014	0	4 (1.3)	0.045
30 to 90-day overall complication	0	2 (0.1)	0.641	0	0	-
30 to 90-day major complication	0	2 (0.1)	0.641	0	0	-
30 to 90-day biliary complication	0	2 (0.1)	0.641	0	0	-
Over 90-day overall complication	0	22 (0.7)	0.033	0	2 (0.6)	0.157
Over 90-day major complication	0	22 (0.7)	0.033	0	2 (0.6)	0.157
Over 90-day biliary complication	0	0	<0.001	0	0	-
Mortality	0	0	-	0	0	-
Postoperative hospital stays, day	6.9±1.5	9.4±2.7	<0.001	6.9±1.5	9.2±2.6	<0.001

Data are shown as mean ± standard deviation or n (%)

PSM, propensity score matching; PLDRH, pure laparoscopic donor right hepatectomy; ODRH, open donor right hepatectomy; BMI; body mass index, AST, aspartate aminotransferase; ALT, alanine aminotransferase.

Table 3. Univariate and multivariate analyses of risk factor for 30-day major complication

Variables	Univariate			Multivariate		
	OR	95% CI	p	OR	95% CI	p
Sex, female	0.797	0.467-1.358	0.404			
Age, year	0.984	0.955-1.014	0.284			
BMI, kg/m²	1.007	0.929-1.092	0.862			
Graft type						
Modified right lobe		Reference				
Modified extended right lobe	0.000	-	-			
Extended right lobe	0.967	0.300-3.117	0.955			
Multiple portal vein openings	2.566	1.353-4.865	0.004	2.306	1.211-4.393	0.011
Middle hepatic vein opening ≥4	0.336	0.082-1.379	0.130			
Inferior right hepatic vein, present	1.404	0.854-2.308	0.181			
Mutiple hepatic artery openings	1.962	0.775-4.966	0.155			
Bile duct opening						
Single		Reference				
Double-barrel	0.719	0.280-1.844	0.492			
Separated multiple	1.359	0.795-2.324	0.262			
Graft weight ≥750g	1.524	0.928-2.503	0.096	Stepwise eliminated		
Warm ischemic time, min	0.860	0.726-1.019	0.102			
Operation time, min	1.001	0.999-1.003	0.373			
Surgery type, open procedure	3.428	0.835-14.080	0.087	3.146	0.764-12.958	0.112
Preoperative steatosis ≥ 20%	1.423	0.510-3.967	0.500			

OR, odds ratio; CI, confidence interval; BMI; body mass index.

Table 4. Univariate and multivariate analyses of risk factor for 30-day biliary complication

Variables	Univariate			Multivariate		
	OR	95% CI	p	OR	95% CI	p
Sex, female	1.076	0.507-2.286	0.848			
Age, year	0.998	0.957-1.041	0.935			
BMI, kg/m²	1.107	0.992-1.236	0.068	1.101	0.989-1.226	0.079
Graft type						
Modified right lobe		Reference				
Modified extended right lobe	<0.001	-	-			
Extended right lobe	<0.001	-	-			
Multiple portal vein openings	4.217	1.851-9.609	0.001	3.742	1.583-8.848	0.003
Middle hepatic vein opening ≥4	<0.001	-	-			
Inferior right hepatic vein, present	0.814	0.388-1.711	0.588			
Mutiple hepatic artery openings	2.66	0.795-8.894	0.112			
Bile duct opening						
Single		Reference				
Double-barrel	0.742	0.168-3.278	0.694			
Separated multiple	1.746	0.789-3.860	0.169			
Graft weight ≥750g	1.846	0.888-3.837	0.101			
Warm ischemic time, min	0.909	0.733-1.127	0.383			
Operation time, min	1.002	0.999-1.004	0.121			
Surgery type, open procedure	<0.001	-	>0.999			
Preoperative steatosis ≥ 20%	1.576	0.371-6.689	0.537			

OR, odds ratio; CI, confidence interval; BMI; body mass index.

Abstract Submission No.: OP-0487

Raising awareness about organ donation and transplantation among healthcare professionals at 108 Military Central Hospital: A single experience center in Vietnam

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Objectives : Organ donation can be a life-saving opportunity for patients with severe organ failure. In Vietnam, the rate of organ donation of the deceased Vietnam population is exceptionally low. This necessitates enhancing awareness regarding organ donation among health care professionals, which can motivate the general population.
Methods : In the 108 Military Central Hospital, we have implemented a number of solutions to help improve awareness about organ donation and transplantation among healthcare professionals such as: Conducting research about awareness of objects (basic information, sources of information, factors influencing the decision to donate organs...), sending medical staff to extra classes about ODT, especially the class about approaching the family of potential deceased donors, organizing consultations and propaganda on ODT, establishing independent recipient groups and donor groups to exchange information about ODT and establish a network of medical staff in the hospital to promptly detect brain-dead patients as potential organ donors.
Results : The number of brain-dead individuals identified as viable organ donors (50 cases) in the first half of 2024 has increased dramatically following the implementation of the aforementioned methods (to match the entire number of patients identified in the preceding five years).The successful organ donation rate reached 10%.
Conclusions : It is necessary to raise the knowledge of organ donation among healthcare professionals. Solutions related to establishing a network and training members related to the topic of detecting potential brain-dead organ donors as well as mobilizing patients' families should be given special priority in hospital policy.

Abstract Submission No.: OP-0457

Smartening of Organ Donation Process

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Objectives : Organ donation from a brain-dead person is done through a three-step process that begins with the identification of a suspected brain-dead case, continues with the mission of coordinator, and ends with the allocation of an organ. Postponed identification processes and poor management led to organ and donor loss. In which, during the last 14 months in a single center procurement unit, out of 428 potential donors, 174 cases were missed. In case of developing a smart process, all cofounding factors, would be considered beyond the human faults. We introduce a platform to overcome all concerns of donation process.
Methods : We created an application which nurses can use for input GCS of patients instead of writing on sheets. It alerts if their GCS is 3 and recommends further considerations. Coordinator will be notified if a clinical examination indicated brain death. Application guides coordinator step by step. Allocation system works as a block chain system which each receiver considered as a new block and more stakes get the organ. Also, it includes a social media to share experiences. We employed this method in Imam Hossein hospital for three months in 2022 and compared donation rates with the same period in 2021.
Results : There was an increase of 5.41 folds in potential donors, 1.5 folds in actual donors, and 1.5 folds in procured organs (4 kidneys, 3 livers and I heart)
Conclusions : Donors detection will improve by using this application and saves time and human sources. Also, reduces hospital staffs mismanagement which lead to improvement in the process. Guidance of this application helps coordinators with better choices in the face of challenges and it can be used as a learning courses platform. Blockchain system ensures transparency and security in allocating resources, and social media improves colleagues communication.

IMG_1306.jpeg

Imam Hossein Hospital		April (M*)	May (M)	June (M)	July (M)
2021(Y*)	Potential Donors	4	2	3	3
	Actual Donors	2	2	1	1
	Procured Organs	6	5	2	2
		4K*/2L*	4K/1L	2K	1K/1L
2022(Y)	Potential Donors	25	11	20	9
	Actual Donors	2	1	3	3
	Procured Organs	6	3	10	5
		4K/2L	2K/1L	6K/3L/1H*	2K/3L

Y*= Year / M*= Month
K*= Kidnev / L*= Liver / H*= Heart

Abstract Submission No.: OP-0244

Changes in glomerular filtration rate in the first year after living kidney donation

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Objectives : To investigate the changes in estimated glomerular filtration rate (eGFR) and associated factors after one year of living kidney donation.
Methods : A retrospective descriptive study was conducted on 189 living kidney donors in the Cho Ray Hospital's outpatient department from January 2014 to December 2020.
Results : A total of 189 living kidney donations, including 106 females and 83 males, were analysed. The mean age was 49.68 ± 9.00 years, and the baseline (pre-donation) eGFR was 88.74 ± 13.27 mL/min/1.73m^2. In females and 83 males, one month after donation, the mean eGFR was 65.19 ± 10.56 mL/min/1,73m^2, decreased by 26.5%. After one year, eGFR was 70,68 ± 11,94ml/min/1.73 m^2, so the eGFR difference between one month to one year was 5.49 ± 9.85 mL/min/1.73m^2 ($p < 0.001$). There was a slightly negative correlation between pre-donation serum cystatin C (-0.17), mGFR (-0.16), and change in eGFR after one year of donation ($p < 0,05$).
Conclusions : eGFR gradually improved after donation. Cystatin C level and mGFR before donation negatively correlated with eGFR change one year after kidney donation. Regular monitoring and prompt management of potential issues post-kidney donation are essential for ensuring long-term health and well-being.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Oral Presentation

Oral Presentation 12
(Laboratory / Pathology / Infection)

Abstract Submission No.: OP-0022

Assessment of a Decentralized Donor-Derived Cell-Free DNA Assay for Monitoring Kidney Transplant Rejection

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[4]Department of Department of Nephrology and Kidney Transplantation, Vall d Hebron University Hospital, Vall d Hebron Research Institute, Vall d Hebron Barcelona Campus Hospital, Barcelona Autonomous University, Barcelona, Spain
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Objectives : Donor-derived cell-free DNA (dd-cfDNA) is an emerging non-invasive biomarker for detecting allograft injury. This study aimed to evaluate a new decentralized dd-cfDNA testing kit (AlloSeq cfDNA) against the current standard centralized dd-cfDNA testing service broadly utilized in the United States (AlloSure Kidney).
Methods : Kidney transplant recipients with decentralized AlloSeq cfDNA and centralized AlloSure Kidney dd-cfDNA measurements and concomitant kidney allograft biopsies were included in the study. A total of 580 kidney allograft recipients from 3 referral centers were enrolled, accounting for 603 total evaluations. Correlation between assays was evaluated using r-squared (r^2) and Spearman's rank correlation test, and associations with rejection were analyzed using logistic regression analyses.
Results : Mean dd-cfDNA levels from decentralized AlloSeq cfDNA and centralized AlloSure Kidney tests were 0.51 ± 0.81% and 0.43 ± 0.78%, respectively. The assays were highly correlated, with r^2 = 0.95 and Spearman's rank correlation of 0.88 ($p<0.0001$). Mean dd-cfDNA levels were 1.15 ± 1.60% with rejection and 0.39 ± 0.48% without rejection ($p<0.0001$) for decentralized AlloSeq cfDNA assay, and 1.06 ± 1.47% with rejection and 0.31 ± 0.49% without rejection ($p<0.0001$) for centralized AlloSure Kidney assay. Both tests showed significant association with allograft rejection ($p<0.0001$). Consistency between the assays was also confirmed across clinical scenarios including post-transplant timepoints, allograft stability, and allograft rejection subcategories (antibody-mediated and T-cell mediated or mixed rejection).
Conclusions : This decentralized dd-cfDNA AlloSeq assay demonstrates high accuracy and value in non-invasively monitoring kidney recipients for allograft rejection.

Abstract Submission No.: OP-0302

Clinical significance of late onset antibody-mediated rejection without donor-specific anti-HLA antibodies in kidney transplantation

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Objectives : Late onset antibody-mediated rejection (AMR) is a leading cause of allograft failure after kidney transplantation. Although the presence of donor-specific antibodies (DSA) is no longer required for AMR diagnosis according to Banff 2017 classification, the clinical significance of late onset AMR without DSA remains unclear.
Methods : We analyzed 137 cases of late onset AMR (> 6 months after transplant) that meet the Banff 2017 histologic criteria for AMR. All cases were diagnosed by for cause biopsy and grouped into DSA-positive (n=116) and DSA-negative (n=31) AMR groups.
Results : The diagnosis of AMR was made on median 87 months after transplantation. Two groups had similar histological pictures and graft renal function at the time of biopsy. Of the DSA-negative AMR group, 19 patients were tested for antibodies against angiotensin II type 1 receptor and 6 of them had antibodies (31.6%). In total, 85.7% of patients received AMR-specific treatment, including rituximab, plasmapheresis, and/or intravenous immunoglobulin. During a median follow-up of 41 months after AMR diagnosis, 48 patients lost their grafts. The 5-year death censored graft survival rates were 61.6% for DSA-positive AMR and 70.6% for DSA-negative AMR (P = 0.752). Multivariable analysis revealed that young age, interstitial fibrosis/tubular atrophy (ci+ct score), transplant glomerulopathy (cg score), and impaired renal function at the time of biopsy were independent risk factors for death-censored graft loss. During the follow-up, graft renal function after AMR diagnosis was comparable between DSA-positive and DSA-negative AMR.
Conclusions : DSA-negative late onset AMR have similar clinical outcomes compared to DSA-positive AMR.

Abstract Submission No.: OP-0209

Kidney Transplant Biopsy Stain Transfer Using Multi-Domain Generative Adversarial Network and Novel Hue Loss

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Objectives : This study aimed to improve the virtual special stain generation from H&E-stained kidney tissue images. Special stains, such as PAS, AFOG, and PAMS, are essential for diagnosing conditions like kidney transplant rejection. However, they are time-consuming, labor-intensive, and lead to higher costs. Multiple types of histological staining require numerous tissue samples, which is particularly challenging when biopsy tissue is small. Often, H&E stains are available before special stains, allowing for a preliminary diagnosis, with the final diagnosis relying on special stains provided later. We sought to enhance existing deep learning-based stain transfer methods by incorporating a novel hue loss into a multi-domain GAN-based model and apply on an unpaired kidney transplant biopsy data, potentially reducing costs associated with traditional staining methods.
Methods : We developed a GAN model for multi-domain stain transfer, training it on 4,068 whole slide images (WSI) from Severance Hospital, covering H&E, PAS, AFOG and PAMS stains. A total of 1,351,540 patches (512 x 512, 0.5 mpp) were used in training. The model introduced a novel HL, calculated via mean squared error between generated and target hue maps. We evaluated the model using 39 WSIs, generating 9,513 patches, and assessed its performance through FID metrics. Generated stains were compared to original WSIs from the same pathology specimens.
Results : Our model, incorporating HL, showed improved FID scores (lower is better) compared to the baseline model: H&E to PAS (87.38 vs. 108.37), H&E to AFOG (102.23 vs. 118.40), and H&E to PAMS (135.79 vs. 146.78). The generated stain transfer images from H&E to the special stains were successfully reconstructed into WSI that closely resemble the histochemically stained slides of the same specimen, allowing for pathologist examination (Figure).
Conclusions : The addition of HL to our GAN-based model improves the quality of virtually generated special stains from H&E images in kidney transplant tissue.

ATW_abstract_image02.png

Baseline Model
Hue Loss Model
Input H&E
Generated PAS
Generated AFOG
Generated PAMS
Original PAS
Original AFOG
Original PAMS
Hue Loss Model
Whole Slide Image Reconstruction
Input H&E
Generated PAS
Generated AFOG
Generated PAMS

Abstract Submission No.: NP-0242

The Spatially Resolved Transcriptional Profile of Chronic Active Antibody Mediated Rejection in a Kidney Allograft

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Objectives : Transcript analysis is seen as another means of studying rejection. Most studies are based on bulk RNA sequencing, which is difficult to determine the differences in transcripts between substructures of kidney. Therefore, the whole exome GeoMx Digital Space Profiling platform was used to study three to four regions of interest (ROI) from glomeruli, peritubular capillaries, and large-sized vessels in the renal allograft biopsies each from two patients diagnosed with chronic active antibody mediated rejection (CAMR), and in analogous areas from two patients diagnosed with no evidence of rejection (NER), and one normal kidney control sample.
Methods : Three glomerular, three peritubular capillaries, and three vascular ROIs were identified for each allograft and control biopsies. Four glomerular ROIs were identified per biopsies from two CAMRs and DSA-positive NER. GeoMx Digital Space Profiling was performed for all ROIs with probes targeting 18275 genes. Student's t test was used to calculate differential gene expression analysis after Q3 normalization. DAVID was used for Biological Process Gene ontology enrichment analysis with a p-value cutoff of 0.01.
Results : Compared to control glomeruli, DSA-positive CAMR glomeruli showed significant 162 upregulated genes enriched in antigen processing via MHC class II and T cell activation. The peritubular capillary regions of both CAMRs also showed similar enrichment in upregulated genes associated with antigen processing via MHC class II and T cell activation, compared to control peritubular capillaries. No such upregulated enrichment was identified in vascular ROIs of DSA-negative CAMR and both NERs. DSA-positive CAMR vascular ROI had an upregulated enrichment for T cell mediated cytotoxicity and angiogenesis compared to control.
Conclusions : DSA-positive CAMR showed increased gene expression associated with antigen processing in glomeruli and peritubular capillaries but not in vessels. DSA-negative CAMR showed similar enrichment only in peritubular capillaries. Interestingly, T cell activation-associated transcripts were upregulated in all the vascular compartments of DSA-positive CAMR.

Abstract Submission No.: OP-0133

Nationwide Five-Year Analysis of ABO Antibody Titer Testing: Laboratory Support for ABO Incompatible Transplantation

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Objectives : ABO-incompatible transplantation (ABOi-TPL) is a crucial approach to mitigating the organ donor shortage. Accurate measurement of ABO antibodies is essential, but current titration methods have variability between laboratories and individuals, due to insufficient standardization and harmonization. In this study, we analyzed the consistency of ABO antibody titer tests across laboratories and aimed to discuss the future directions for the development of ABO antibody titer testing.
Methods : We analyzed five years (2019-2023) of external quality assessments for ABO antibody titers conducted by the Korean Association of External Quality Assessment Service. The analysis included the number of participating institutions, reporting methods, rates of acceptable results. To conduct comparative analysis between the column agglutination test (CAT) and tube methods, we created a normalized variable ((log titer of laboratory test result) – (mean of log titer for the peer group)) and analyzed the variance.
Results : The number of participating institutions and tests trended to increase. The use of the CAT method increased, while tube methods decreased. The rate of acceptable results remained stable (P = 0.5645), from 2019 to 2023, with values of 94.4%, 98.5%, 95.9%, 94.5%, and 95.6%, respectively. The acceptable results rates ranged from 84.0% to 100%, with no significant difference observed between the CAT and tube methods (P = 0.1584). An F-test comparing the variance among institutions using the CAT and tube methods showed no significant difference (P = 0.507).
Conclusions : Domestic laboratories demonstrated overall high-quality performance in ABO antibody titer tests, without significant differences in acceptable result rates or variance across different methods. However, continuous efforts to enhance testing and standardization and harmonization are essential. Considering how rare ABOi-TPL is in Western countries, Korean researchers have the potential to significantly contribute to this field.

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Oral Presentation

Oral Presentation 13
(Heart)

Abstract Submission No.: NP-0315

Optical coherence tomography guided plaque assessment : a potential tool for detecting the cardiac allograft vasculopathy progression

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Objectives : The vessel characteristics observed through optical coherence tomography (OCT) imaging, both at short and long-term follow-up after heart transplantation (HT), are inadequately defined.
Methods : HT recipients were prospectively enrolled at a single tertiary center from December 2021 to July 2024 for OCT imaging of the left anterior descending artery. Evaluations were conducted either short-term (baseline to 1-year post-HT) or long-term (at 5- or 10- year post-HT). OCT findings were qualitatively assessed for advanced plaque characteristics and quantitatively for area stenosis.
Results : A total of 37 patients (average age 55 years, 89.5% male) were enrolled. Of these, 29 patients (78.4%) underwent short term evaluation, and 8 patients (21.6%) had long-term follow-up. The average recipient age at HT was younger in the long-term cohort (44 years vs. 59 years, p=0.036). OCT analysis showed increased area stenosis in the long-term cohort compared to the short-term group (66.6±10.5% vs. 51.4±14.7%, p=0.015). Advanced and vulnerable plaque characteristics, such as the presence of microvessels for neovascularization (71.4% vs. 12.0%, p=0.005), macrophages (71.4% vs. 16.0%, p=0.010), and healed plaque (71.4% vs. 12.0%, p=0.005), were also more common in the long-term cohort. One patient in the long-term group was angiographically diagnosed with CAV during the OCT assessment. Throughout the follow-up, this patient, who had angiographically confirmed CAV, experienced antibody-mediated rejection, while the others remained event-free.
Conclusions : OCT-guided plaque assessment is helpful for detecting early progression of CAV in HT patients. Further larger study should be warranted.

Abstract Submission No.: OP-0226

Experiences for coronary artery vasculopathy in pediatric heart transplantation recipients.

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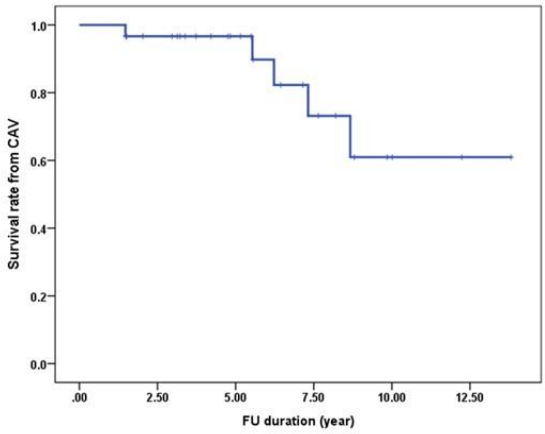
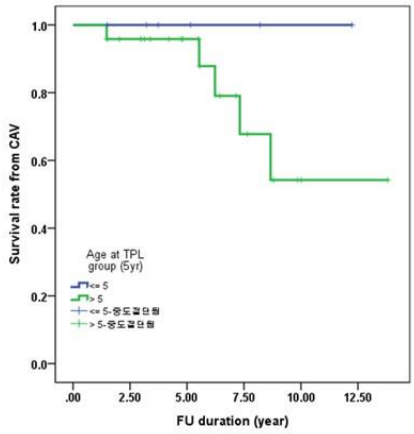
Objectives : A coronary artery vasculopathy (CAV) after heart transplantation (TPL) remains the leading cause of late mortality in pediatric heart transplant recipients. We aimed to share experiences of CAV in pediatric patients after heart transplantation.
Methods : The medical records of total 30 pediatric patients under follow-up for more than 1 year after heart transplantation were retrospectively analyzed from annual routine cardiac muscle biopsy and coronary artery angiography in all pediatric heart transplantation survivors.
Results : Median age at heart transplantation was 10.5 years (interquartile range: 6.4 ~ 14.2) and female number was 16. The median follow-up duration was 5.6 years (interquartile range: 3.1 ~ 7.8). Among them, 5 patients were diagnosed as a CAV by coronary artery angiography and their median follow up period after heart TPL was 6.2 years (range: 1.5 ~ 8.7). Even though 1 patient complained of dyspnea on exertion and 1 patient showed sinus tachycardia, 3 patients did not have any symptoms at the time of diagnosis. The laboratory tests also showed a significantly increased brain natriuretic peptide (BNP) level (1391 ng/dl) in only 1 patient, and 2 patients had mild elevation of BNP level. In electrocardiogram, all patients did not show any ischemic findings. In echocardiography, only 1 patient showed mild decrease of left ventricle ejection fraction. Among 5 patients, 1 patient was expired due to graft failure, and 4 patients underwent percutaneous coronary artery stent insertion. In our group, 3 years, 6 years, and 10 years free survival rate from CAV in pediatric heart transplant survivors were 96.7%, 89.8%, and 60.9%, consecutively. Patients under 5 years of age at the time of heart transplantation did not develop CAV in our patient population.
Conclusions : CAV is not uncommon in pediatric heart transplant survivors, and regular coronary artery angiography is required because ischemic symptoms may not be evident.

Figure.jpg


Survival rate from CAV
1.0
0.8
0.6
0.4
0.2
0.0
.00
2.50
5.00
7.50
10.00
12.50
FU duration (year)


Survival rate from CAV
1.0
0.8
0.6
0.4
0.2
0.0
Age at TPL group (5yr)
<= 5
> 5
<= 5-중도절단됨
> 5-중도절단됨
.00
2.50
5.00
7.50
10.00
12.50
FU duration (year)

Abstract Submission No.: NP-0392

The Korean Organ Transplant Registry (KOTRY): Third Official Adult Heart Transplant Report

Hyo-In Choi[1], Sang Eun Lee[2], Eun-Seok Jeon[3], Dong-Ju Choi[4], In-Cheol Kim[5], Minjae Yoon[7], Seok-Min Kang[6], Soo Young Lee[8], Jae-Joong Kim[2]
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[4]Department of Cardiology, Seoul National University Hospital, Korea, Republic of
[5]Department of Cardiology, Keimyung University Dongsan Medical Center, Korea, Republic of
[6]Department of Cardiology, Yonsei University College of Medicine, Korea, Republic of
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Objectives : The Korean Organ Transplant Registry (KOTRY) provided data for this third official report on adult heart transplantation (HT), including information from 709 recipients.
Methods : Data from HTs performed at seven major centers in Korea between March 2014 and December 2020 were analyzed, focusing on immunosuppression, acute rejection, cardiac allograft vasculopathy (CAV), post-transplant survival, and mechanical circulatory support (MCS) usage.
Results : The median ages of the recipients and donors were 56.0 years and 43.0 years, respectively. Cardiomyopathy and ischemic heart disease were the most common preceding conditions for HT. A significant portion of patients underwent HT at waiting list status 1 and 0. In the multivariate analysis, a PHM mismatch was associated with a higher risk of 1-year mortality. Patients over 70 years old had a significantly increased risk of 6-year mortality. The risk of CAV was higher for male donors and donors older than 45 years. Acute rejection was more likely in patients with panel reactive antibody levels above 80%, while statin use was associated with a reduced risk. The employment of left ventricular assist device as a bridge to transplantation increased from 2.17% to 22.4%. Pre-transplant extra-corporeal membrane oxygenation was associated with worse post-transplant survival.
Conclusions : In this third KOTRY report, we analyzed changes in the characteristics of adult HT recipients and donors and their impact on post-transplant outcomes. The most notable discovery was the increased use of MCS before HT and their impact on post-transplant outcomes.

Abstract Submission No.: OP-0240

Impact of Everolimus Initiation and Corticosteroid Weaning During Acute Phase After Heart Transplantation on Clinical Outcome: Data From the Korean Organ Transplant Registry (KOTRY)

Kyu-Sun Lee[1], Hyun-Jai Cho[2], Hyungseop Kim[3], Dong-Ju Choi[4], Jin-Oh Choi[5], Sung-Ho Jung[6], Jae-Joong Kim[7], Seok-Min Kang[8], Soo Yong Lee[9], Min Ho Ju[10]
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[6]Department of Thoracic and Cardiovascular Surgery, Ulsan University Hospital, Korea, Republic of
[7]Department of Cardiology, Ulsan University Hospital, Korea, Republic of
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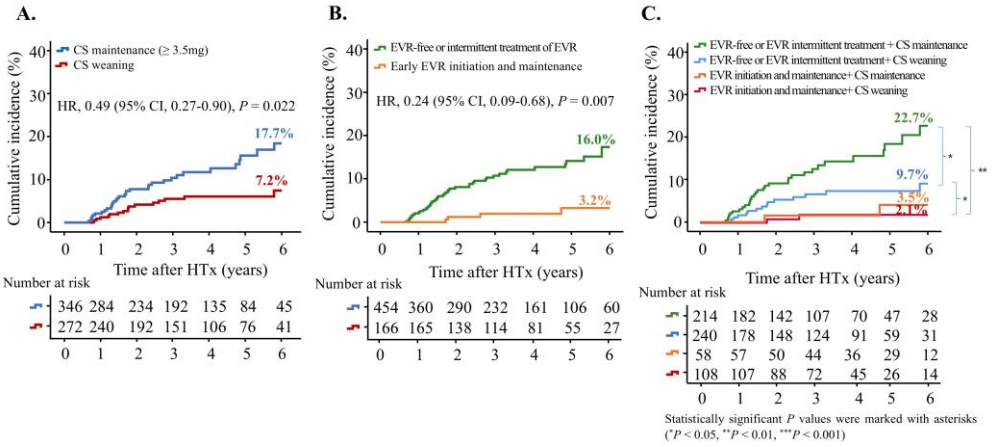
[10]Department of Thoracic and Cardiovascular Surgery, Pusan National University Hospital, Korea, Republic of

Case Study : The effect of changes in immunosuppressive therapy during the acute phase post-heart transplantation (HTx) on clinical outcomes remains unclear. This study aimed to investigate the effects of changes in immunosuppressive therapy by corticosteroid (CS) weaning and everolimus (EVR) initiation during the first year post-HTx on clinical outcomes. We analyzed 622 recipients registered in the Korean Organ Transplant Registry (KOTRY) between January 2014 and December 2021. The median age at HTx was 56 years (interquartile range [IQR], 45–62), and the median follow-up time was 3.9 years (IQR 2.0–5.1). The early EVR initiation within the first year post-HTx and maintenance during the follow-up was associated with reduced risk of primary composite outcome (all-cause mortality or re-transplantation) (HR, 0.24; 95% CI 0.09–0.68; P < 0.001) and cardiac allograft vasculopathy (CAV) (HR, 0.39; 95% CI 0.19–0.79; P = 0.009) compared with EVR-free or EVR intermittent treatment, regardless of CS weaning. However, early EVR initiation tends to increase the risk of acute allograft rejection compared with EVR-free or EVR intermittent treatment.

3.jpg

Impact of everolimus initiation and corticosteroid weaning within the first year post-HTx on the primary outcome



Statistically significant *P* values were marked with asterisks (*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$)

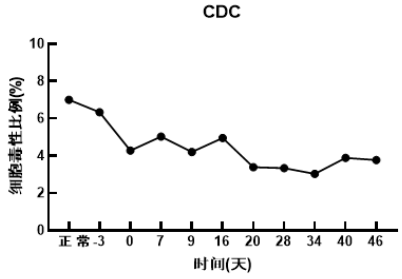
Abstract Submission No.: OP-0060

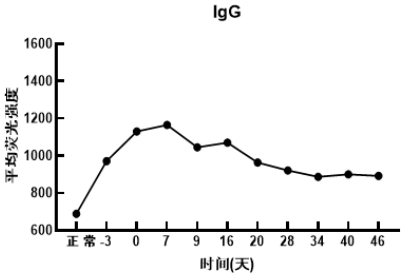
Application of Immunosuppressive Regimen in Xenotransplantation of Gene-Edited Porcine Heart to Rhesus Macaque

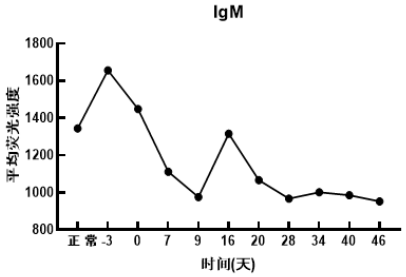
Ziqiang Dai, Dianyuan Li, Zhipeng Ren, Baoluo Du, Huan Wang, Gen Zhang, Dongsheng He
Department of Thoracic and Cardiovascular Surgery, Thoracic and Cardiovascular Surgery Suzhou Municipal Hospital, China, China

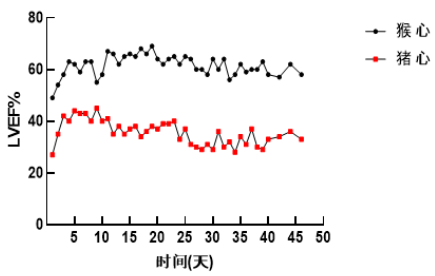
Objectives : With advancements in xenotransplantation, genetically edited pigs are being explored as potential organ donors for primates. This study aims to discuss the immunosuppressive regimen used in a xenotopic heart transplantation from a gene-edited pig to a rhesus macaque, with the goal of providing reference for future studies.
Methods : A comprehensive immunosuppressive protocol was employed, including preoperative induction therapy (anti-CD20 antibody - rituximab, anti-CD154 monoclonal antibody, antithymocyte globulin, cobra venom factor, methylprednisolone) initiated 14 days before surgery, and postoperative maintenance therapy (anti-CD154 monoclonal antibody, mycophenolate mofetil, methylprednisolone). The recipient's immune status was monitored using flow cytometry and blood cell counts to evaluate the efficacy of the immunosuppression.
Results : The rhesus macaque survived 46 days post-transplant with stable function of the transplanted heart and no signs of hyperacute or acute rejection. The induction therapy effectively reduced the numbers and proportions of lymphocytes, B cells, and T cells, maintaining low levels of immune activity. Postoperative monitoring indicated controlled complement cytotoxicity (3.4%–5.1%), stable IgG and IgM antibody binding, and favorable absolute values and ratios of B/T lymphocytes. Pathological analysis showed minor myocardial damage in the monkey heart but more severe damage in the porcine heart, suggesting chronic immune rejection.
Conclusions : The immunosuppressive regimen demonstrated significant effectiveness in suppressing hyperacute and acute rejection, providing an important strategy for xenotransplantation of gene-edited pig hearts. However, observed chronic rejection highlights the need for further optimization of immunosuppressive protocols, particularly for managing chronic rejection.

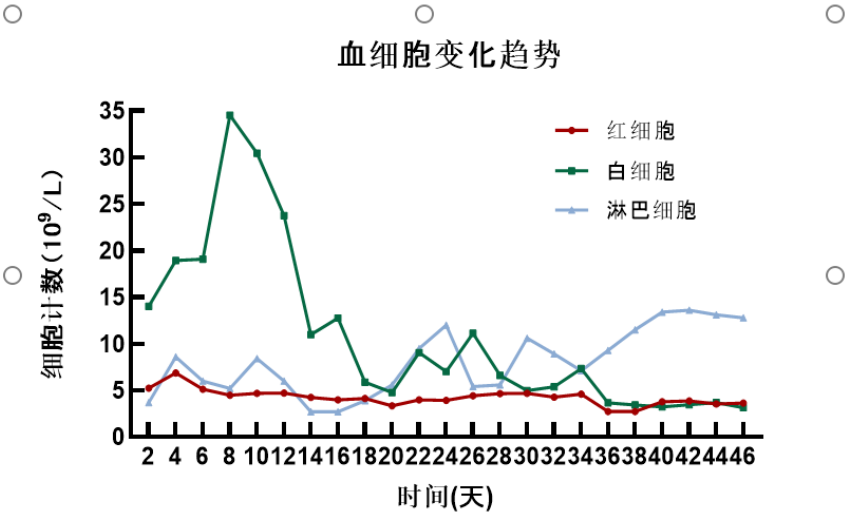
实验结果.png


CDC
细胞毒性比例(%)
0
2
4
6
8
10
正常 -3 0 7 9 16 20 28 34 40 46
时间(天)


IgG
平均荧光强度
600
800
1000
1200
1400
1600
正常 -3 0 7 9 16 20 28 34 40 46
时间(天)


IgM
平均荧光强度
800
1000
1200
1400
1600
1800
正常 -3 0 7 9 16 20 28 34 40 46
时间(天)


LVEF%
0
20
40
60
80
5 10 15 20 25 30 35 40 45 50
时间(天)
猴心
猪心


血细胞变化趋势
细胞计数(10^9/L)
0
5
10
15
20
25
30
35
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46
时间(天)
红细胞
白细胞
淋巴细胞

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Challenges and Opportunities in Asian Transplantation

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 1
(Liver)

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0449

Identifying Risk Factors for Diffuse Intrahepatic Biliary Stricture in ABO-Incompatible Living Donor Liver Transplantation: An Analysis of 1,000 Cases.

YOUNG-IN YOON, Gi-Won Song, shin Hwang, Ki-Hun Kim, Chul-Soo Ahn, Deok-Bog Moon, Tae-Yong Ha, Dong-Hwan JUNG, Gil-Chun Park, Sung Gyu LEE
Department of Liver Transplantation and Hepatobiliary Surgery, Asan Medical Center, Korea, Republic of

Objectives : Diffuse intrahepatic biliary stricture (DIHBS) is a critical and refractory complication of antibody-mediated rejection (AMR) following ABO-incompatible living donor liver transplantation (LDLT). Despite advances in transplantation techniques, DIHBS remains a significant cause of graft failure and patient morbidity. This study aims to assess the clinical outcomes of DIHBS in AMR patients and identify key risk factors associated with its development in a cohort of 1,000 ABO-incompatible LDLT recipients.
Methods : We retrospectively reviewed the medical records of patients undergoing ABO-incompatible LDLT between November 2008 and June 2024 performed at a single institution in Korea. In total, 1042 recipients were included in this study. Risk factors for DIHBS following ABO-incompatible LDLT were evaluated using logistic regression models.
Results : DIHBS occurred in 52 out of 1,042 ABO-incompatible LDLT recipients, resulting in an incidence rate of 4.99%. DIHBS was associated with significantly lower overall survival and graft survival in recipients compared to those without DIHBS ($p = 0.001$ for both). Multivariable analysis revealed that recipient blood type O (odds ratio [OR]: 3.691, 95% confidence interval [CI]: 1.439-9.469; $p = 0.007$), the number of preoperative plasma exchanges (OR: 1.118, 95% CI: 1.021-1.235; $p = 0.028$) and postoperative plasma exchanges (OR: 1.066, 95% CI: 1.011-1.123; $p = 0.018$), and a diagnosis of rejection on biopsy were independent risk factors for DIHBS. Additionally, elevated peak anti-ABO antibody titers within the first month post-transplantation were strongly predictive of DIHBS, with titers between 1:256 and 1:1024 (OR: 11.972, 95% CI: 1.831-78.284; $p = 0.010$) and titers ≥ 1:1024 (OR: 17.312, 95% CI: 2.824-88.687; $p = 0.002$) showing the highest risk.
Conclusions : Given the significant impact of DIHBS on patient survival, especially in those with identified risk factors, tailored desensitization protocols and vigilant management are essential for improving outcomes in this high-risk population.

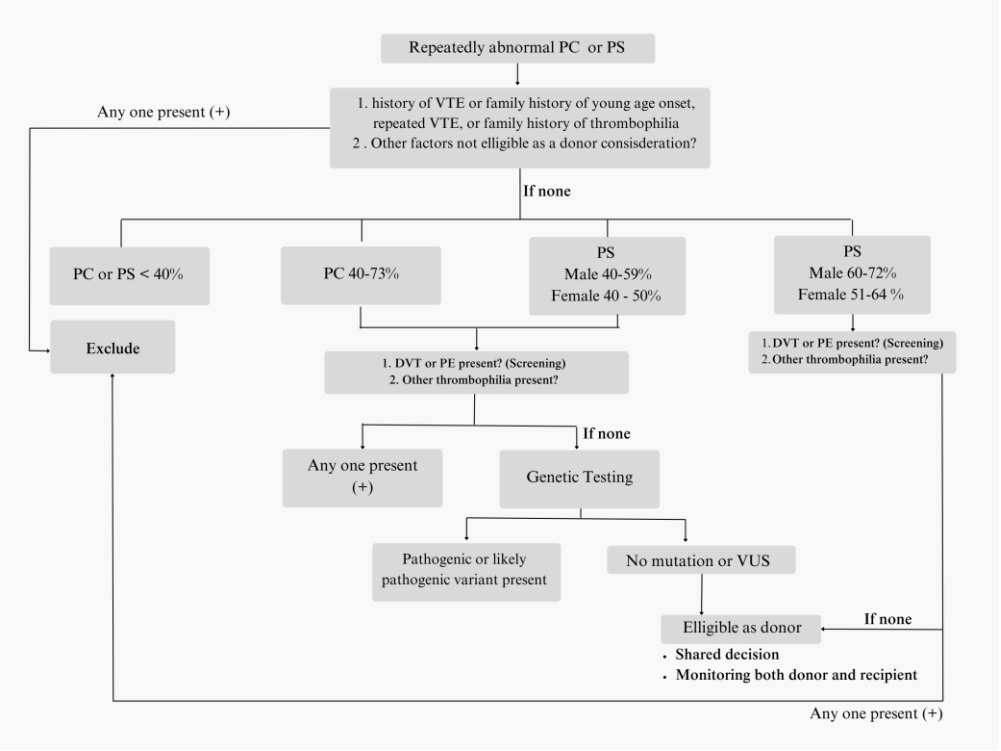
Abstract Submission No.: NP-0482

Optimizing Thrombophilia Screening Algorithms for Living Liver Donors: Prevalence and Decision-Making Insights in Korean Candidates

Sola Lee[1], Suk Kyun Hong[2], Jae-Yoon Kim[2], Jeong-Moo Lee[2], YoungRok Choi[2], Nam-Joon Yi[2], Kwang-Woong Lee[2], Kyung-Suk Suh[2]
[1]Department of Surgery, Division of Transplant Surgery, Chonnam National University Hospital, Korea, Republic of
[2]Department of Hepatobiliary and Pancreatic Surgery, Seoul National University Hospital, Korea, Republic of

Objectives : This study aims to assess the prevalence of Protein C and Protein S deficiencies among living liver donor candidates and to propose a comprehensive donor evaluation algorithm that balances donor safety with the preservation of the donor pool.
Methods : We conducted a retrospective review of living liver donor candidates who underwent primary evaluation at a single center from January 2017 to February 2022. Deficiencies in Protein C and Protein S were classified into severe, moderate, mild, and near-normal categories based on functional activity levels. We analyzed demographic and clinical data, including genetic testing results, donation status, and postoperative outcomes. A decision-making algorithm for liver donors was proposed based on real-world practices and evidence from a review of the literature.
Results : The incidence of Protein C deficiency was 0.4% (n=6/1,421), with two donors having PROC mutations in the mild and near-normal categories. Protein S deficiency was found in 1.7% (n=24/1,421) of donors, including one with a PROS mutation and severe deficiency. None of the donors with deficiencies experienced thrombotic complications, although three recipients had unrelated thrombotic events. For severe deficiencies, donors should be rejected; other cases should undergo screening for deep vein thrombosis or pulmonary embolism. Genetic testing is recommended for Protein C deficiencies, and selective mutation testing for Protein S deficiencies based on gender and severity.
Conclusions : The incidences of Protein C and Protein S deficiencies among liver donors are notable and should not be overlooked. Each center should account for geographic and ethnic variations when establishing thrombophilia evaluation protocols to ensure donor safety.

THrombophilia_graphic_abstract.png


Repeatedly abnormal PC or PS
1. history of VTE or family history of young age onset, repeated VTE, or family history of thrombophilia
2 . Other factors not elligible as a donor consisderation?
Any one present (+)
If none
PC or PS < 40%
PC 40-73%
PS
Male 40-59%
Female 40 - 50%
PS
Male 60-72%
Female 51-64 %
Exclude
1. DVT or PE present? (Screening)
2. Other thrombophilia present?
1. DVT or PE present? (Screening)
2. Other thrombophilia present?
If none
Any one present (+)
Genetic Testing
Pathogenic or likely pathogenic variant present
No mutation or VUS
Elligible as donor
If none
Shared decision
Monitoring both donor and recipient
Any one present (+)

Abstract Submission No.: OP-0282

Incidence of Epstein-Barr Virus and Risk of Post-Transplant Lymphoproliferative Disorder in Pediatric Liver Transplant Recipients: A Single-Center Study in Korea (2019-2024)

Kyong Ihn[1], Hye Jung Choi[2], Ji Young Lee[2], Jee Yeon Baek[2], Jong Gyun Ahn[2], Keum Hwa Lee[2], Hong Koh[2], Myoung Soo Kim[3], Ji-Man Kang[2]
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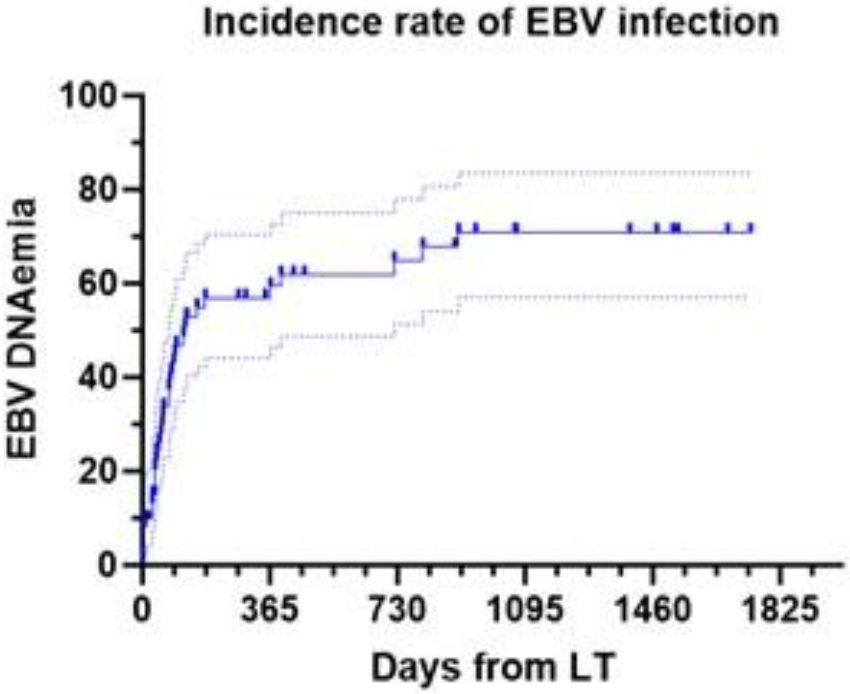
Objectives : Monitoring Epstein–Barr virus (EBV) after liver transplantation (LT) is crucial due to the high risk of developing post-transplant lymphoproliferative disorder (PTLD). However, data on the incidence of EBV DNAemia and the associated risk of PTLD progression in Korean pediatric LT recipients are limited.
Methods : This study included children (<20 years of age) who underwent LT at Yonsei University Severance Hospital, Korea, between January 2019 and June 2024. EBV DNAemia and associated clinical manifestations were retrospectively analyzed through a review of medical records. Cases involving death due to LT-related complications within 3 months post-transplant or the initial LT in patients who underwent repeat LT were excluded from the analysis.
Results : A total of 59 children underwent 64 LT procedures, with 50 patients (50 cases) included in the final analysis. The median age at LT was 2.2 years (range, 0.3–19.3 years), with a male-to-female ratio of 0.85:1. Biliary atresia was the most common indication for LT, accounting for 35 cases (70%), followed by acute liver failure (7 cases, 14%), malignancy (1 case, 2%), and other indications (7 cases, 14%). Pre-transplant, 72% (36/50) of recipients were EBV seropositive, compared to 96% (22/23) of donors. The cumulative incidence of EBV DNAemia at 6 months, 1 year, and 3 years post-transplant was 54.9%, 57.0%, and 71.0%, respectively. Among the 33 patients with EBV DNAemia, 60% (n=20) had chronic EBV DNAemia, with persistently positive titers for over 6 months. Three cases of PTLD were observed, all in patients with chronic EBV DNAemia (15% vs. 0%, p=0.029). The median interval from the detection of EBV DNAemia to PTLD diagnosis was 23 months (range, 5–31 months). No EBV-related deaths were reported.
Conclusions : Vigilant monitoring for PTLD is essential in pediatric LT recipients with chronic EBV DNAemia.

PTLD_fig.jpg


Incidence rate of EBV infection
EBV DNAemia
100
80
60
40
20
0
0
365
730
1095
1460
1825
Days from LT

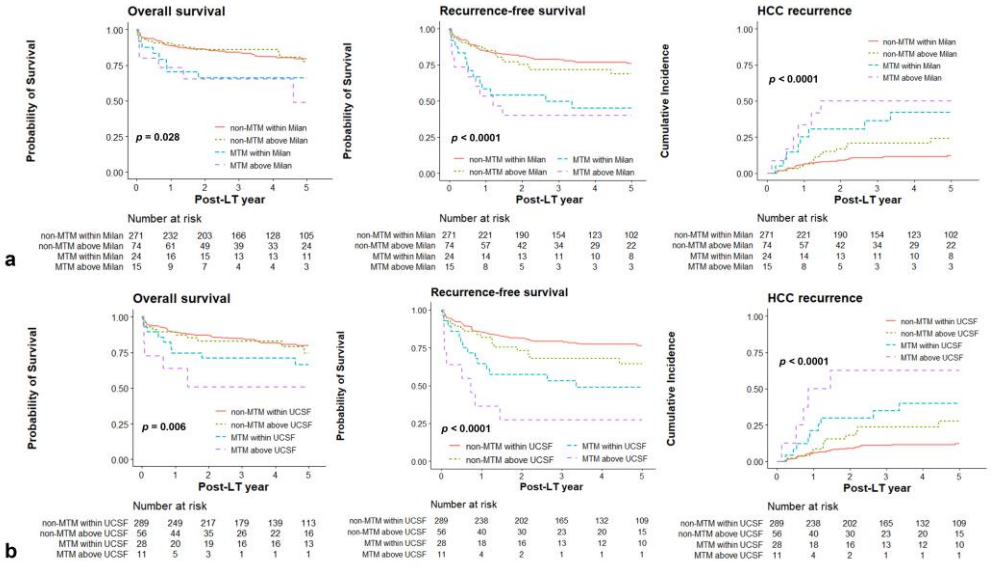
Abstract Submission No.: OP-0455

Prognostic Impact of Macrotrabecular-Massive Hepatocellular Carcinoma in Liver Transplantation Surpassing Current Selection Criteria: A Retrospective Cohort Study

Eun-Ki Min[1], Byungsoo Ahn[2], Deok-Gie Kim[1], Mun Chae Choi[1], Seung Hyuk Yim[1], Dong Jin Joo[1], Myoung Soo Kim[1], Jae Hyon Park[3], Young Nyun Park[1], Jae Geun Lee[1]
[1]Department of Surgery, Division of Transplant Surgery, Severance Hospital, Korea, Republic of
[2]Department of Pathology, Yonsei University College of Medicine, Korea, Republic of
[3]Department of Radiology, Armed Forces Daejeon Hospital, Daejeon, Korea, Republic of

Objectives : Macrotrabecular-massive hepatocellular carcinoma (MTM-HCC) is a uniquely aggressive histologic subtype; however, its clinical significance in liver transplantation (LT) outcomes remains unknown.
Methods : This single-center retrospective study reviewed the explant pathology of 441 patients who underwent LT for HCC. Clinical and biological characteristics, as well as adherence to six renowned LT selection criteria, were reviewed. Overall survival (OS), recurrence-free survival (RFS), and recurrence rates were compared based on the MTM-HCC subtype and transplant criteria.
Results : MTM-HCC was identified in 39 cases, constituting 8.8% of the total cohort and 10.2% of the histopathologically confirmed cases. MTM-HCC was significantly associated with higher levels of alpha-fetoprotein and prothrombin induced by vitamin K absence or antagonist-II, microvascular invasion, poor differentiation, satellite nodules, and keratin 19 positivity (all $p<0.001$). Patients with MTM-HCC exhibited poorer OS, RFS and a higher HCC recurrence rate than non-MTM-HCC patients, irrespective of whether they met the Milan or University of California, San Francisco criteria (all $p<0.001$). This pattern in survival and HCC recurrence remained statistically significant across the four other established transplant criteria. Multivariate regression analysis confirmed the negative impact of MTM-HCC on OS and RFS, with hazard ratios of 1.88 (95% confidence interval [CI]: 1.01-3.48, $p=0.046$) and 2.06 (95% CI: 1.22-3.47, $p=0.006$), respectively.
Conclusions : Our study reveals that the MTM-HCC subtype significantly impacts patient survival and post-LT tumor recurrence, further stratifying the established selection criteria. Histopathological information should be incorporated into LT decision-making through pre-transplant diagnosis, enabling a more tailored therapeutic approach for the MTM subtype.

[포맷변환]Fig. 3.png


a
Overall survival
Probability of Survival
p = 0.028
non-MTM within Milan
non-MTM above Milan
MTM within Milan
MTM above Milan
Post-LT year
Number at risk
non-MTM within Milan 271 232 203 166 128 105
non-MTM above Milan 74 61 49 39 33 24
MTM within Milan 24 16 15 13 13 11
MTM above Milan 15 9 7 4 4 3
Recurrence-free survival
Probability of Survival
p < 0.0001
non-MTM within Milan 271 221 190 154 123 102
non-MTM above Milan 74 57 42 34 29 22
MTM within Milan 24 14 13 11 10 8
MTM above Milan 15 8 5 3 3 3
HCC recurrence
Cumulative Incidence
p < 0.0001
non-MTM within Milan 271 221 190 154 123 102
non-MTM above Milan 74 57 42 34 29 22
MTM within Milan 24 14 13 11 10 8
MTM above Milan 15 8 5 3 3 3

b
Overall survival
Probability of Survival
p = 0.006
non-MTM within UCSF
non-MTM above UCSF
MTM within UCSF
MTM above UCSF
Post-LT year
Number at risk
non-MTM within UCSF 289 249 217 179 139 113
non-MTM above UCSF 56 44 35 26 22 16
MTM within UCSF 28 20 19 16 16 13
MTM above UCSF 11 5 3 1 1 1
Recurrence-free survival
Probability of Survival
p < 0.0001
non-MTM within UCSF 289 238 202 165 132 109
non-MTM above UCSF 56 40 30 23 20 15
MTM within UCSF 28 18 16 13 12 10
MTM above UCSF 11 4 2 1 1 1
HCC recurrence
Cumulative Incidence
p < 0.0001
non-MTM within UCSF 289 238 202 165 132 109
non-MTM above UCSF 56 40 30 23 20 15
MTM within UCSF 28 18 16 13 12 10
MTM above UCSF 11 4 2 1 1 1

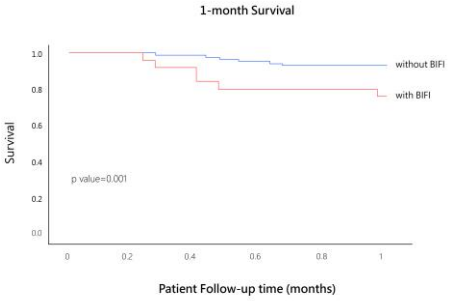
Abstract Submission No.: OP-0097

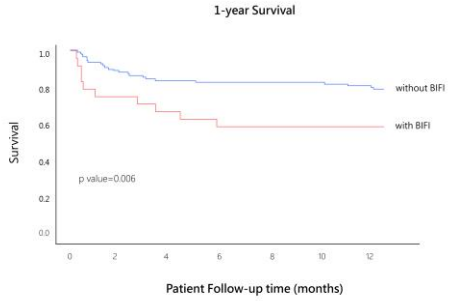
Breakthrough invasive fungal infection in liver transplantation

Chih Yao Hu[1], Yi Tsung Lin[2], Niang Cheng Lin[1], Hsin Lin Tsai[3], Hao Jan Lei[4], Meng Hsuan Chung[1], Cheng Yuan Hsia[4], Che Chuan Loong[1], Chin Su Liu[3], Cheng Yen Chen[1]
[1]Department of Surgery, Division of Transplant Surgery, Taipei Veterans General Hospital, Taiwan
[2]Department of Medicine, Division of Infectious Diseases, Taipei Veterans General Hospital, Taiwan
[3]Department of Surgery, Division of Pediatric Surgery, Taipei Veterans General Hospital, Taiwan
[4]Department of Surgery, Division of General Surgery, Taipei Veterans General Hospital, Taiwan

Objectives : Liver transplant (LT) recipients are at a high risk for invasive fungal infections (IFI) due to the immunosuppressive therapy required to prevent graft rejection. The incidence of IFI in this population ranges from 5% to 42%, with associated mortality rates reaching as high as 80%. Despite the use of antifungal prophylaxis, breakthrough invasive fungal infections (BIFI) continue to occur, posing a significant threat to patient outcomes. The existing literature on BIFI in liver transplant patients is limited, underscoring the need for further research to enhance prophylactic strategies and improve survival rates.
Methods : This retrospective, single-center study aimed to investigate the incidence, risk factors, and outcomes of BIFI in adult LT recipients who received antifungal prophylaxis between April 2013 and April 2024 at Taipei Veterans General Hospital. BIFI was defined as the isolation of fungal organisms from blood, ascites, or bile during the period of antifungal prophylaxis. The primary outcome was the occurrence of BIFI, while secondary outcomes included patient and graft survival rates.
Results : A total of 162 patients were analyzed. Anidulafungin was the most used antifungal agent (81.5%), followed by Micafungin (16%) and Fluconazole (2.4%). BIFI occurred in 26 patients (16%), mainly due to yeast infections cultured from blood (n=7), ascites (n=19), and bile (n=4). BIFI patients had lower cumulative survival rates at 1 month (73.1%), 6 months (61.5%), and 1 year (61.5%) post-transplant, along with longer ICU and hospital stays. Postoperative renal replacement therapy, bile leak, and bacterial infection were independent risk factors for BIFI.
Conclusions : BIFI is a serious complication that reduces survival rates after liver transplantation. Close monitoring and targeted interventions for patients with bile leaks, bacterial infections, or postoperative renal replacement therapy are crucial for improving outcomes.

patient survival.jpg


1-month Survival
Survival
1.0
0.8
0.6
0.4
0.2
0.0
p value=0.001
without BIFI
with BIFI
0
0.2
0.4
0.6
0.8
1
Patient Follow-up time (months)


1-year Survival
Survival
1.0
0.8
0.6
0.4
0.2
0.0
p value=0.006
without BIFI
with BIFI
0
2
4
6
8
10
12
Patient Follow-up time (months)

Abstract Submission No.: VP-0443

Optimizing Liver Ex Vivo Splitting with Indocyanine Green: A Fluorescence-Guided Methodology

Sang Hyuk Park, YoungRok Choi, Kwang-Woong Lee, Min Kyoung Kim, Gayoung Kim, Jae-Yoon Kim, Jeong-Moo Lee, Nam Joon Lee, Kyung-Suk Suh
Department of Surgery, Seoul National University Hospital, Korea, Republic of

Case Study : In certain cases of liver transplantation, it is necessary to reduce the hepatic volume due to the discrepancy between the large liver volume of the donor and the smaller volume required by the recipient, or in cases such as auxiliary partial orthotopic liver transplantation (APOLT). Ex vivo liver splitting is performed on the back table, which takes less time compared to in situ splitting. This shorter duration translates to reduced cold ischemic time. However, ex vivo splitting can cause more damage to vessels and bile ducts than in situ splitting. To optimize ex vivo liver splitting, similar to in vivo hepatectomy, we utilize indocyanine green (ICG) dye. ICG is metabolized in the liver and excreted through the biliary tract, making it a preferred dye for hepatobiliary surgeons to identify liver segments during hepatectomy. Our surgical strategy for ex vivo liver splitting with ICG involves several steps. First, we determine the target part of the liver and obstruct the outflow. Next, ICG is injected into the inflow vessels (either the hepatic artery or portal vein). After the injection, fluoroscopy is used to confirm the resection margin and demarcation line. Finally, parenchymal resection is performed along the identified demarcation. We have successfully applied this method in our institution for two cases of ex vivo liver splitting: one for reducing liver size in transplantation and another for APOLT. Both procedures were completed without any surgical complications related to the biliary system or vessels.

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 2
(Liver)

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0367

Outcomes and risk factors for de novo major depressive disorder after liver transplantation: nested case control study

Young Jin Yoo, Deok-Gie Kim, Hwa-Hee Koh, Minyu Kang, Jae Geun Lee, Dong Jin Joo
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Objectives : Major depressive disorder (MDD) is important psychiatric complication after liver transplantation (LT). This study aims to analyze the impact and risk factors of de novo MDD on LT survival.
Methods : A retrospective analysis was conducted on 1350 LT recipients at Severance Hospital, Korea, from July 2005 to December 2022. MDD patients were matched 1:5 with controls using a nested case-control design to control for immortal time bias.
Results : During follow-up after LT, 58 (4.3%) were newly diagnosed with MDD. The median time from LT to MDD diagnosis was 316 (IQR 46-920) days. MDD patients had significantly lower graft survival rates compared to controls at 1, 3, and 5 years after matched time points (89.5%, 75.3%, and 66.5% vs. 95.5%, 91.5%, and 86.4%, respectively, P=0.003). Multivariable Cox regression identified de novo MDD as an independent risk factor for reduced graft survival (HR 2.39, 95% CI 1.15-4.98, P=0.003). Independent risk factors for de novo MDD included female sex (OR 2.29, 95% CI 1.16-4.53, P=0.017), alcoholic liver disease (OR 2.36, 95% CI 1.16-4.75, P=0.016), pre-transplant encephalopathy (OR 2.95, 95% CI 1.49-5.79, P=0.002), and lower hemoglobin levels (OR 0.85, 95% CI 0.73-0.98, P=0.025).
Conclusions : In our matched population using nested case control, de novo MDD significantly reduced survival in LT patients. Screening and early intervention are needed for LT recipients having risk factors for MDD.

mdd.jpg

Table 3. Risk factors for de novo MDD after LT

	Univariable		Multivariable[a]	
Variables	**OR (95% CI)**	***P***	**OR (95% CI)**	***P***
Age	0.96 (0.93-0.99)	0.005		
Female	2.15 (1.18-3.86)	0.012	2.29 (1.16-4.53)	0.017
BMI	0.89 (0.81-0.98)	0.014	0.92 (0.84-1.01)	0.083
Diabetes mellitus	0.55 (0.27-1.06)	0.088		
Cardiovascular disease	2.28 (0.90-5.34)	0.066		
Alcoholic liver disease	3.08 (1.71-5.53)	0.001	2.36 (1.16-4.75)	0.016
HCC	0.50 (0.27-0.89)	0.020		
Pretransplant MELD	1.03 (1.00-1.05)	0.036		
Pretransplant in-hospital stay	1.77 (1.00-3.14)	0.049		
Encephalopathy before LT	3.92 (2.13-7.19)	0.001	2.95 (1.49-5.79)	0.002
AST at index POD	1.01 (1.00-1.02)	0.044		
Hemoglobin at index POD	0.80 (0.70-0.91)	0.001	0.85 (0.73-0.98)	0.025
Unmarried	2.52 (0.92-6.29)	0.056		
Caregiver, parent	5.73 (2.14-15.40)	0.001	2.77 (0.83-9.16)	0.093

Abstract Submission No.: OP-0423

CYP3A5 Single Nucleotide Polymorphism Affects Tacrolimus Intrapatient Variability After Liver Transplantation

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Objectives : The relationship between intrapatient variability (IPV) of tacrolimus and single nucleotide polymorphisms (SNPs) after liver transplantation remains poorly understood. Our objective was to investigate the association between IPV of tacrolimus and eight specific SNPs.
Methods : We genotyped 146 patients, including donors and recipients, for eight SNPs related to tacrolimus metabolism in the CYP3A5, MDR1, ABCC1, and POR genes. We then retrospectively reviewed electronic medical records. The high IPV group, defined as having an IPV (CV%) ≥ 30%, was compared to the low IPV group. We compared preoperative and postoperative variables as well as SNP diplotypes between the two groups. Multivariate logistic regression analysis was used to identify risk factors for high IPV (>30%).
Results : In the multivariate analysis, we found that SNPs in both recipients and donors were significant risk factors for high IPV. Specifically, CYP3A5 6986G>A diplotypes GA and GG from the donors' side were found to be significant independent risk factors (OR 6.300, 95% CI 1.247–31.834, p = 0.03). From the recipients' side, MDR1 1236 C>T diplotypes CT and TT were associated with higher IPV (OR 13.953, 95% CI 1.694–114.913, p = 0.01). Furthermore, glucose levels over 120mg/dL at 3 months were significantly associated with high IPV (OR 6.740, 95% CI 1.247–36.414, p = 0.03).
Conclusions : Both recipient's and donor's SNPs can impact IPV, particularly the importance of considering CYP3A5 and MDR1 SNPs before initiating tacrolimus treatment. Additionally, the presence of these SNPs can help predict the level of IPV.

Abstract Submission No.: VP-0361

Unique multidisciplinary approach in living donor liver transplantation to achieve total physiological revascularization in a patient with complete occlusion of portal vein system with combined chronic and sub-acute thrombosis

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Case Study : Patients receiving liver transplantation in a setting of complete portal vein (PV) and superior mesenteric vein (SMV) thrombosis (Yerdel grade 4) experience lower outcomes after surgery; prognosis is independently influenced by the portal flow reconstruction technique, showing better outcomes in physiological surgical strategies. We describe a case of living donor liver transplantation in which the patient could not receive common physiological reconstructions pre-operatively due to multiple small collaterals and extensive thrombosis down to 1st branches of SMV. We performed thrombo-endo-venectomy of the portal vein and SMV first, but acute thrombosis developed recurrently even with interposition venous homograft between peri-choledochal collateral vein and proximal recipient portal vein. Immediate after surgery, intervention radiologist performed stenting insertion into 3 stenotic points. Through multidisciplinary approach, complete physiologic recanalization was obtained with normal liver function.

Abstract Submission No.: PP-0492

Evaluating the SALT Prediction Model (Survival After Liver Transplantation for Hepatocellular Carcinoma): An External Validation Study for 5 Years

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Objectives : The SALT (Survival After Liver Transplantation) calculator was developed using data from 578 patients who underwent LDLT (Living Donor Liver Transplantation) for HCC (Hepatocellular Carcinoma) between June 2006 and July 2018 at Seoul National University Hospital (SNUH). This model identified several factors significantly associated with HCC-specific death (HCCD) and demonstrated robust internal and external validation results. Therefore, this study aims to validate the SALT calculator with an additional cohort of 266 LDLT for HCC patients from SNUH, treated between August 2018 and December 2022.
Methods : Validation was conducted using R software, version 4.4.0. Performance metrics included the c-index, calibration plot, and 5-year AUROC.
Results : The mean follow-up period was 37 months (range: 12-65 months). The bootstrap-corrected Uno's c-index for the cumulative incidence of HCCD at 3 years and 5 years was 0.80 (95% CI: 0.62–0.96) and 0.81 (95% CI: 0.65–0.94), respectively. The calibration slopes for the 3-year and 5-year cumulative incidences were 2.26 (95% CI: 0.64–4.14) and 1.68 (95% CI: 0.57–2.81). The AUROC values were 0.805 at 3 years and 0.8255 at 5 years.
Conclusions : The SALT calculator continues to be a valuable predictive tool for HCC-specific survival after liver transplantation, particularly over extended follow-up periods. Future efforts will focus on further validation and refinement with multi-center data to enhance its accuracy and applicability.

Abstract Submission No.: OP-0072

Outcome Of Living Donor Liver Transplant In Donors With Body Mass Index 30

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Objectives : Obesity is a relative contraindication for liver donation in Living donor liver transplant (LDLT), which might influence donor and recipient outcomes. We hereby analyse donor and recipient's post-transplant outcomes in donors with BMI ≥30.
Methods : A retrospective analysis of 500 living donors and recipients who underwent LDLT in our centre between May 2020 to July 2024 were considered. Data of the donors with BMI>30 (n=33) and corresponding recipients were compared with 467 donor with BMI< 30. Liver attenuation index (LAI) and Magnetic resonance imaging derived proton density fat fraction (MRPDFF) were used to quantify steatosis. Fifty prospective donors with BMI ≥30 were evaluated, Liver biopsy was done in selected donors (n=39/50) and steatosis >15% were excluded (17/50:34%). Donor and recipient data was compared for ,blood loss, LFT on day 7 and 14, length of stay, complications and in-hospital mortality.
Results : In the BMI>30 group, 3 donors had hypothyroidism and the rest had no comorbidities. Average BMI in obese group was 33.5 (30-42.6) kg/m2. All 33 donors were subjected to lifestyle modification (low calorie diet with moderate exercise) for a period of 2-3 weeks. Weight reduction (>5%) was achieved in 18% (6 donors), intragastric balloon was placed in 1 donor before surgery. Among both groups, there was no significant difference in LAI (+8.2HU vs +9.1HU) and MRPDFF (5.23% vs 3.88%). 13/33(39%) donors underwent pure laparoscopic donor hepatectomy, 2 were converted to open, the rest of donors underwent open hepatectomy. No statistical difference was seen in LFT of Donors in both groups and their recipients. Both groups had similar postoperative complications and lengths of hospital stay for donors (5.86 vs 6.62 days) and recipients (15.6 vs 16).
Conclusions : Donors with BMI ≥30 have similar outcomes in donor and recipients. They can be safely considered for donation, after careful selection and with acceptable steatosis on evaluation.

Abstract Submission No.: OP-0452

Anatomical Risk Factors for Portal Vein Complications Following Right Hepatectomy in Living Donors

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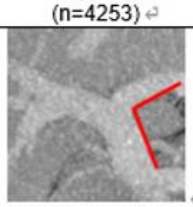
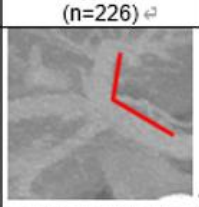
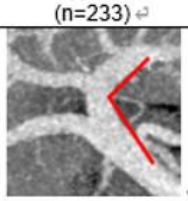
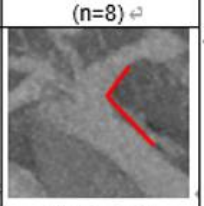
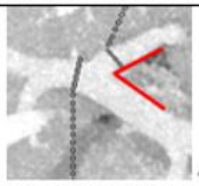
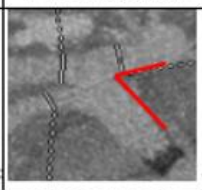
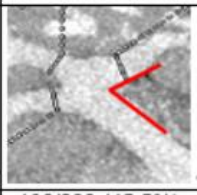
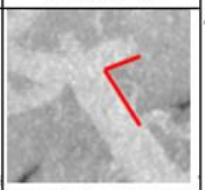
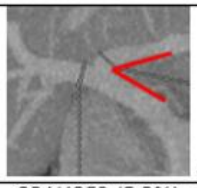
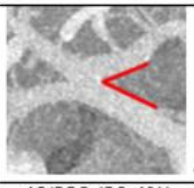
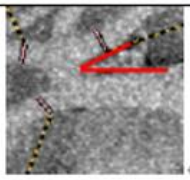
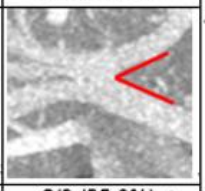
Case Study : With the increase in living donor liver transplantation, large-scale studies on donor morbidity have been conducted to ensure the safety of living donors. However, reports demonstrating portal vein (PV)-related complications following right hepatectomy in living donors compared with those demonstrating other surgical complications are lacking. This study evaluated the incidence, risk factors, and clinical outcomes of PV complication after right lobe donor hepatectomy (RLDH). Single-center retrospective analysis of 4720 consecutive donors who underwent RLDH, between July 1997 and 2020 December. Computed tomographic angiographies of the donor were 2-dimensionally reconstructed, and the portal vein was classified according to angle between main and left PV. The incidence of PV-related complications following RLDH was 1.9% (n = 88), including PV thrombosis (n = 9) and PV stenosis (n = 79). Donors with PV-related complications exhibited significantly higher peak alanine aminotransferase levels than those without PV complications (P = 0.023); however, peak total bilirubin (P = 0.055), peak international normalized ratio (P = 0.395) and postoperative hospital stays (P = 0.117) were similar. Multivariate logistic regression revealed an angle between the main and left PV of < 60 degrees as a significant independent risk factor for PV-related complications (odds ratio: 6.250; P < 0.001). Additionally, variant PV anatomy, absence of falciform ligament fixation, and a body mass index >30 kg/m^2 were identified as independent risk factors for PV-related complications (P < 0.001, P < 0.001, and P = 0.002, respectively). Acute angulation between main and left PV or variant PV has a higher tendency to occur PV complication after RLDH. For those donors require meticulous surgical techniques during operation and periodic image studies after operation.

F I G U R E.png

Angle between main PV and left PV		PV anatomy (n=4720)			
		Normal PV	Anomalous PV		
		Type I (n=4253)	Type II (n=226)	Type III (n=233)	Others (n=8)
Obtuse Angle	>90				
		3183/4253 (74.8%)	74/226 (32.7%)	67/233 (28.8%)	4/8 (50.0%)
Acute Angle	60-90				
		849/4253 (20.0%)	106/226 (47.0%)	106/233 (45.5%)	2/8 (25.0%)
	<60				
		221/4253 (5.2%)	46/226 (20.4%)	60/233 (25.8%)	2/8 (25.0%)
Total		4253/4720 (90.1%)	226/4720 (4.8%)	233/4720 (5.1%)	8/4720 (0.1%)

Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 3
(Kidney / Pancreas)

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0298

Urinary Cysteine Levels Post-Transplant: A Potential Biomarker for Acute T-cell Mediated Rejection in Renal Transplantation

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Objectives : We have identified urinary cysteine levels as a new biomarker for acute kidney injury. This study investigates the dynamic changes in urinary cysteine levels after kidney transplantation and evaluates its potential role as a biomarker for acute T-cell mediated rejection (ATCMR) in renal transplant recipients.
Methods : In a prospective cohort study from June 2016 to February 2018, we analyzed 692 urine samples from 226 renal transplant recipients at Seoul National University Hospital. Urinary cysteine levels were detected using the NPO-B fluorescent probe, with samples collected immediately post-transplant and at regular intervals up to one year. Clinical, histological, and biopsy data were integrated to assess the association of urinary cysteine levels with rejection.
Results : Elevated urinary cysteine levels were observed on post-transplant day 6, decreasing significantly over the first month ($\beta = -1.17$ per day, $p < 0.001$). Cysteine levels were higher in urine samples from patients with ATCMR compared to those with borderline acute T-cell mediated rejection (BDR) or no acute rejection (NAR) ($p = 0.021$ and $p = 0.003$, respectively). Significant association was found between urinary cysteine levels and intimal arteritis scores (v score) ($p = 0.009$). No significant association was observed between cysteine levels and other pathological conditions or initial post-transplant factors.
Conclusions : Our study suggests that urinary cysteine may serve as a promising, noninvasive biomarker for acute T-cell mediated rejection in renal transplantation. Despite the limitations, including the predominantly living donor cohort and single-center design, urinary cysteine shows potential for monitoring rejection and assessing IRI. Multi-center studies with larger, diverse cohorts are needed to validate these findings and refine cysteine's role in clinical practice.

Abstract Submission No.: OP-0233

Living Donor Kidney Transplantation Referral Outcomes at One Year Experience from Singapore General Hospital

Li Ting Siew, Constance Lee, Chelsi Nicole Leah Xin Hui, Jia Qin Tan, Ziqi Jocelyn Quek, Ian Tatt Liew , Quan Yao Ho, Yi Shern Terence Kee, Sobhana Thangaraju
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Objectives : Kidney transplant (KT) offers the best treatment for end-stage kidney disease (ESKD). Living donor (LD) KT offers superior graft and patient survival as compared to deceased-donor KT. However, LDKT rates remain low in many Asian countries. In this study, we analyse the outcome of LDKT referrals at one year with focus on the reasons for non-actualization of referral to transplantation.
Methods : This is a single-center retrospective cohort study of all referrals for LDKT from 1st January 2021 to 31st March 2023 at the largest transplant unit in Singapore. Referral outcomes at one year from referral were categorized as closed, on-going, or transplanted. Baseline demographic parameters, dialysis modality, financial capacity and LD availability were captured. Reasons for non-actualisation of referrals were further identified.
Results : A total of 368 patients were referred for LDKT during the study period. At one year follow up, 13 (3.5%) received LDKT, 131 (35.6%) had ongoing evaluation and 224 (60.9%) were closed. 77 (34.4%) recipients refused LDKT, which was the most common cause for non-actualisation. Lack of available donors, medical ineligibility of recipients and/or donors and other reasons accounted for 65 (29%), 59 (26.3%) and 20 (8.9%) of closed referrals respectively. As 55 (24.6%) of the entire cohort received financial assistance, only 5 (2.2%) cited financial reasons. Interestingly, recipients who refused LDKT were mostly above 50 years of age, married and on dialysis. More than half had diabetes mellitus as their primary cause of ESKD. Comparatively, recipients without available donors were mostly below the age of 50, less likely to be married or have ESKD due to diabetes.
Conclusions : Our findings on LDKT referral outcomes demonstrate low transplant rates at 1 year, with recipient refusal as the most common cause for non-actualisation. Further evaluation of contributing factors is required to improve LDKT acceptance by potential recipients.

Abstract Submission No.: OP-0198

Long-term infectious disease and risk factors in Korean kidney transplant patients: Results from the KoreaN Cohort Study for Outcome in Patients With Kidney Transplantation (KNOW-KT) Study

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[2]Department of Nephrology, Yonsei University College of Medicine, Korea, Republic of

Objectives : Immunosuppressive medications in kidney transplant (KT) recipients are essential for preserving transplanted graft function. However, immunosuppressive drugs increase the risk of infection in KT populations. This study aimed to investigate the long-term prevalence, epidemiology, and risk factors for infection after KT.
Methods : One thousand seventy-one kidney recipients registered in KNOW-KT cohort were analyzed. Infection diseases included viral, bacterial, pneumocystis jirovecii, and fungal infections. The prevalence, epidemiology, and risk factors of each infection were analyzed during follow-up. All-cause mortality due to infection was also assessed.
Results : The median follow-up of 87 months, all-caused infection prevalence was 42.1 cases per 1000 person-years. Mortality caused by infection was 46.5% of all-caused deaths (20 of 43 events). Female (1.36, 95%C.I.; 1.09-1.67), recipient age (1.01, 95%C.I.; 1.00-1.02), donor age (1.02, 95%C.I.; 1.01-1.03), and number of mismatched HLA >2 (1.91, 95%C.I.; 1.14-3.19) were independent risk factors for all-cause infections. The most common infection was a bacterial infection with a 4% annual incidence. Female (1.93, 95%C.I.; 1.55-2.49), recipient diabetes (1.58, 95%C.I.; 1.21-2.09), donor age (1.02, 95%C.I.; 1.01-1.03) were risk factors for bacterial infection. Among viral infections, most CMV infection was reported 1 y after KT, and herpes infection occurred steadily with a cumulative incidence of 4.7%. Male (1.45, 95%C.I.; 1.03-2.05), donor age (1.03, 95%C.I.; 1.01-1.04), and the number of mismatched HLA >2 (2.53, 95%C.I.; 1.12-5.77) were risk factors for viral infection.
Conclusions : Infection remains an important cause of death during post-transplant duration. Continued awareness of the presentation of infection in KT patients and close monitoring to reduce its impact is still important in post-transplant management.

Abstract Submission No.: OP-0153

Post-Transplantation Dynamics of Non-HLA Antibodies and Early Antibody Intensity as Predictors of ABMR in Kidney Transplantation

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Objectives : The post-transplant evolution and association of non-human leukocyte antigen (non-HLA) antibodies with antibody-mediated rejection (ABMR) development remains unclear.
Methods : In a single-center retrospective study, we examined the ABMR group (n = 15) and the stable allograft function group (n = 15). Serum samples collected pre-transplantation and at post-transplantation days 7, 30, 90, 180, and 360 underwent testing for a panel of 60 non-HLA antibodies. Antibody intensity was calculated by comparing measured MFI values with kit cutoff MFI values.
Results : Total non-HLA antibody intensity was comparable between the two groups pre-transplantation. Antibody intensity decreased at day 7 post-transplantation, returning to pre-transplantation levels around day 30, followed by a gradual increase in intensity in both groups. Eight out of the 60 non-HLA antibodies demonstrated significantly higher intensity in ABMR recipients and predictive capacity for ABMR at day 30. After excluding highly correlated antibodies, KRT8, PECR, and PLA2R1 antibodies were included for the panel. The panel antibody intensity was significantly higher in ABMR recipients both pre-transplantation and at day 30 post-transplantation. Recipients with high antibody intensity at day 30 had a significantly elevated risk of ABMR incidence compared to those with lower intensity (One-year: 50% (29.6% - 84.4%) vs 86.7% (71.1% - 100%), p = 0.002). Both intensity and intensity-based grade were independently associated with a higher risk of ABMR (Intensity: HR = 2.30, CI 1.32 - 4.01, p = 0.003; Grade: HR = 4.59, CI 1.23 - 17.21, p = 0.024).
Conclusions : Non-HLA antibody intensity exhibited a decline and subsequent rebound shortly after transplantation. A high antibody intensity panel, including KRT8, PECR, and PLA2R1 antibodies at day 30 post-transplantation, demonstrated predictive capacity for ABMR.

Abstract Submission No.: OP-0188

A Prediction scheme for eGFR of Deceased donor renal transplant recipient in Korean by machine learning

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Case Study : With the shortage of donor kidneys and increasing kidney disease patients, the kidneys from deceased donors has recently been received attention and implemented on the kidney transplantation after assessment. Compared with the living donor kidney transplant, the deceased donor kidney transplant lasts shorter and is more likely to encounter various problems. In order to non-invasively evaluate the graft survival after kidney transplantation from deceased donor, this paper collected the data from Korean organ transplantation registry, estimated the feature significance and feature correlation to seek the deceased donors and recipients factors that may affect the graft survival of the recipient in Korean's environment and identify the risk. In this paper, we used machine learning-based approaches to evaluate the graft survival and predict the kidney function in third year after kidney transplant. Our research perform the prediction of recipient estimated glumerular filtration rate in the third year by only use the pre-transplantation variables, which can be used by nephrologists to evaluate the recipient graft survival before the kidney transplantation surgery, give a recommendation and avoid the risk of transplant failure.

Abstract Submission No.: OP-0021

Graft Outcomes of ABOi-KTs Are Superior to those of ABOc-KTs over a follow-up of 15 years: single center experiences

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[2]Department of Laboratory Medicine, Maryknoll General Hospital, Korea, Republic of
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Objectives : Donor-specific anti-HLA antibody (DSA) and Anti-ABO antibodies are major barriers to successful kidney transplantation. Current desensitization treatments showed that outcomes of ABO-incompatible KT are inferior to or comparable to ABO-compatible KT. DSAs remain a risk factor for ABMR and graft failure
Methods : Our center was the first hospital that successfully performed the ABO-i KTs in Korea, on the 15th of February 2007. We examined 282 stable KTRs (200 ABOc-KTs and 82 ABOi-KTs) from Feb. 2000 to June 2024. Fifty-two recipients were biopsied (37 in ABOc-KTs and 15 in ABOi-KTs) with DSAs on a single antigen bead assay. Our study compares the graft and clinical outcomes between ABOi-KTs and ABO-c KTs over a 15-year follow-up period, based on experiences from a single center.
Results : Recipients and donors of ABOi-KTs were generally older. The number of HLA mismatches, the proportion of 2nd transplants (3.9 ± 1.1 vs. 3.1 ± 1.6, p=0.001 and 2.5% vs. 9.1%, p=0.05) and the percentage of high total HLA class II EP MM (50.0% vs. 69.2%, p=0.03) were significantly higher in ABOi-KTs than ABOc-KTs. Graft failure rates were significantly lower in ABOi-KTs than in ABOc-KTs (1.2% vs 10.0%, p=0.01), even though it was accompanied by a similar proportion of HLAi-KTs. The 15-year graft survival rate of ABOi-KTs was excellent and comparable to that of ABO-c KTs (97% vs. 96%, p=0.62).
Conclusions : ABO-iKTs, despite older recipient and donor age, higher HLA mismatches / higher HLA class II EP MM, greater proportion of 2nd KTs and living unrelated donor, demonstrated that lower graft failure rates and long-term graft survival comparable to or better than ABO-c KTs over a 15-year follow-up period. Our excellent graft outcomes highlight the potential of ABOi-KTs to expand the donor pool and improve transplant success rates with appropriate patient management and clinical protocols.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 4
(Kidney / Pancreas)

Abstract Submission No.: OP-0277

Use Of Electrothermal Device (Ligasure) For Iliac Vessel Dissection In Kidney Transplantation At National Kidney And Transplant Institute: An Initial Experience

Datu Nasser Pendatun III[1], Siegfredo Ricerra Paloyo[2], Rophel Tafalla Miguel[2], Rose Marie Rosete Liquete[2], Rudolf Villanueva Kuhn[3]
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[2]Department of Organ Transplant and Vascular Surgery, National Kidney and Transplant Institute, Philippines
[3]Department of Department of Medical Imaging and Therapeutic Radiology, National Kidney and Transplant Institute, Philippines

Objectives : Worldwide, kidney transplantation is done as a renal replacement therapy for end-stage kidney disease patients. Lymphocoele is a common complication following renal transplantation, with an incidence which varying between 0.6% and 33.9% after the introduction of ultrasound as follow-up method. Recently, the use of the electrothermal bipolar sealing device (LigaSure) has proven superior to other vessel sealing techniques in several reports, many of them in breast and gynecologic surgeries, both for lymphatic and blood vessel sealing. As such, LigaSure device is expected to provide an alternative method to the standard silk and tie method during kidney transplantation. This study determined our initial experience with the use of Ligasure device during iliac vessel dissection including incidence of lymphocoele, operative time during iliac vessel dissection using LigaSure device, total and average JP drain output.
Methods : A prospective descriptive cross sectional research design among patients who underwent iliac vessel dissection using Ligasure device during kidney transplantation at National Kidney and Transplant Institute from July 2023 to December 2023 was conducted. Clinical outcomes were determined including operative time during iliac vessel dissection using LigaSure device, total and average JP drain output. Incidence of lymphocoele was observed by performing an allograft ultrasound on post-operative day 14, 60 and 90.
Results : Ultrasonographically, none of the patients in this study developed lymphocoele. Average use of Ligasure device during iliac vessel dissection was 16.92 minutes. Average daily JP drain output was 123ml and average JP drain output prior to JP drain removal was 25.44ml.
Conclusions : We did not observe any incidence of lymphocoele among patients wherein Ligasure device was used during iliac vessel dissection. Routine use of Ligasure device can be done without the risk of lymphocoele formation and can serve as an alternative method during iliac vessel dissection.

Abstract Submission No.: OP-0353

Clinical outcomes of ABO incompatible kidney transplantation with delayed-initiation immunosuppression protocol

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[2]Department of Internal Medicine, Incheon St. Mary's hospital, The Catholic University of Korea, Korea, Republic of
[3]Department of Internal Medicine, The Catholic University of Korea Bucheon St. Mary's Hospital , Korea, Republic of
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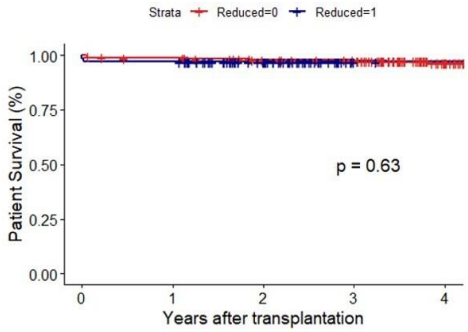
Objectives : ABO-incompatible kidney transplantation (ABO-IKT) has become a viable alternative in countries with a shortage of deceased donors. Typically, a more intensified immunosuppression (IS) protocol is used in ABO-IKT, including desensitization and early initiation of maintenance immunosuppressants; therefore, infectious complications remain a significant challenge to overcome in ABO-IKT. The aim of this study is to investigate the clinical outcomes of ABO-IKT with a delayed initiation of IS protocol in comparison with those of ABO-IKT with a standard IS protocol.
Methods : This study was conducted retrospectively from May 2009 to July 2023, involving 353 patients who received ABO-IKT at Seoul St. Mary's Hospital. Individuals aged 19 or older were included, while those with a history of previous transplants or prior use of immunosuppressants were excluded. Patients were divided into two groups: the early initiation group (n=285), which included those who started tacrolimus 7 days before transplantation and the delayed initiation group (n=68), which included those who started 3 days before ABO-IKT. The primary outcomes were infectious complications, and the secondary outcomes were patient survival, death-censored graft survival, and biopsy-proven acute rejection (BPAR).
Results : Within 1 year after KT, the cumulative incidence of non-viral infections was significantly lower in the delayed initiation group compared to the early initiation group (18.9% vs 8.8%; log-rank P = 0.047). There was no significant difference in patient survival between the early and delayed initiation groups (95.4% vs 97.1%; P = 0.63). Similarly, graft survival rates showed no significant difference between the two groups (88.8% vs 92.6%; P = 0.17). The incidence of BPAR tended to be slightly lower in the delayed initiation group compared to the early initiation group (22.5% vs 2.9%; P = 0.057).
Conclusions : In ABO-IKT, a delayed initiation of IS protocol may contribute to a reduction in non-viral infections within one year after transplantation.

ABOI_figure.jpg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Patient Survival (%)
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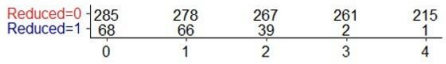
0.50
0.25
0.00
p = 0.63
0 1 2 3 4
Years after transplantation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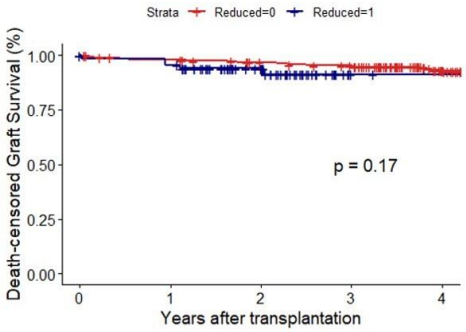
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Death-censored Graft Survival (%)
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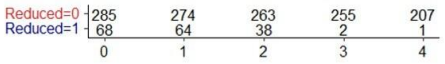
0.50
0.25
0.00
p = 0.17
0 1 2 3 4
Years after transplantation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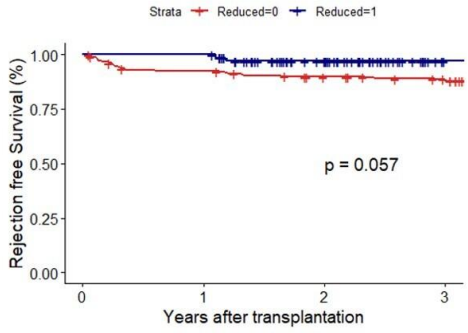
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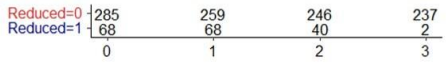
Rejection free Survival (%)
1.00
0.75
0.50
0.25
0.00
p = 0.057
0 1 2 3
Years after transplantation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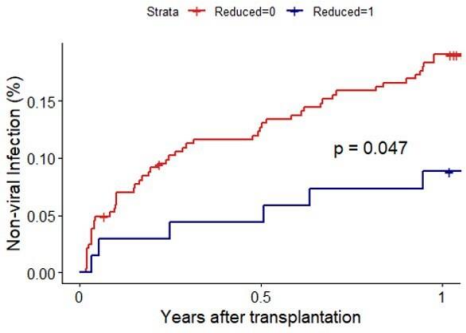
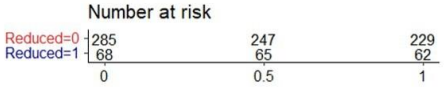
0 1 2 3


Strata Reduced=0 Reduced=1
Non-viral Infection (%)
0.15
0.10
0.05
0.00
p = 0.047
0 0.5 1
Years after transplantation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Reduced=1 68 65 62
0 0.5 1

Abstract Submission No.: OP-0324

The Prognostic Factor of Gender Mismatch with Acute Rejection of Living Donor Kidney Transplant Recipients in Indonesia: A 10-year Retrospective Study

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Objectives : The 10-year patient survival, all-cause survival, and death-censored graft survival rates of kidney transplant recipients in Indonesia were 74%, 68%, and 81% respectively. There are disproportionately more female-to-male donations and fewer male-to-female donations in living donor kidney transplants (LDKT). Gender mismatch may affect acute rejection in transplants. This study aims to evaluate the risk and prognostic factors of gender mismatch in LDKT recipients with acute rejection rate in Indonesia.
Methods : This is the subanalytic study from the previous study by Marbun MBH (2022). A retrospective cohort study was conducted to all donors and recipients of LDKT at dr. Cipto Mangunkusumo Hospital from 2010 to 2020. We classified the donors and the recipients into 4 gender groups (male-to-male, male-to-female, female-to-female, and female-to-male). Gender mismatch is defined as male-to-female and female-to-male groups. The acute rejection rate was analysed with gender mismatch using the Kaplan Meier test and Cox Regression Model in SPSS Statistics version 29.
Results : A total of 732 subjects were included. The acute rejection rate affected 43 subjects (6%). The acute rejection in male recipients (male-to-male and female-to-male) was higher than in female recipients (male-to-female and female-to-female) (44.2% and 41.2% vs 11.6% and 2.3%). The relative risk (RR) of acute rejection in gender mismatch was higher than non-gender mismatch (male-to-male and female-to-female) respectively (1.56 vs 0.64). The RR of acute rejection was highest in the female-to-male ratio (2.03). From statistics, gender mismatch is not the prognostic factor of acute rejection (HR 1.69; 95% CI 0.93 – 3.086; p = 0.085).
Conclusions : The risk of acute rejection was relatively higher in gender mismatch recipients than in non-gender mismatch recipients, with male recipients relatively higher than female recipients. Gender mismatch was not a prognostic factor of acute rejection.

Abstract Submission No.: OP-0206

Outcome of Kidney Transplantation from Deceased Organ Donors with Proteinuria

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Objectives : Kidney transplantation (KT) remains the preferred treatment among end-stage renal disease (ESRD) patients. Thorough evaluation of donors is important in order to properly select candidates for KT. Proteinuria was known to be a strong predictor of ESRD thus reservations have been made for deceased organ donors (DOD) having proteinuria. This study aims to evaluate the outcomes of post-KT recipients from DOD with proteinuria.
Methods : This is a retrospective cohort study of 176 DOD-KT recipients from January 1, 2015 to December 31, 2023. We analyzed the outcomes of recipients receiving allograft kidney from 45 (26%) non-proteinuric DOD vs 131 (74%) proteinuric DOD, including renal function, graft and patient survival up to 12 months post-KT.
Results : Proteinuria was present in 75% of DOD with a mean UTPCR of 1408.8 mg/g. Proteinuric DOD had a lower pre-transplant eGFR (73 ml/min/1.73m^2 vs. 78 ml/min/1.73m^2) and higher incidence of acute kidney injury. Vehicular accident was the most common cause of death among proteinuric DOD. A total of 131 recipients (74%) who received allograft kidneys from proteinuric DOD had a higher incidence of delayed graft function (83%), higher creatinine compared to non-proteinuric DOD (1.72 mg/dl vs 1.35 mg/dl), and a lower eGFR (65 ml/min/1.73m^2 vs. 69 ml/min/1.73m^2) 12 months post-KT. Urine dipstick proteinuria was present in only 16% of recipients after 12 months and showed decreasing level of proteinuria post-KT. Graft survival was 97% among proteinuric DOD-KT recipients compared to 100% of non-proteinuric DOD KT recipients.
Conclusions : Our data showed a high prevalence of proteinuria in deceased donors, particularly those who died from vehicular accident and cerebrovascular disease. Proteinuria showed subsequent decline 12 months post-transplantation. The presence of proteinuria in the deceased donor did not adversely affect graft outcomes in this study. Outcomes can be analyzed conclusively with a bigger sample size and longer follow-up period.

Abstract Submission No.: OP-0340

Reducing Pediatric Kidney Transplant Rejection Rates: A Quality Improvement Initiative

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Department of Kidney and Pancreas Transplantation, King Faisal Specialist Hospital-Riyadh, Saudi Arabia

Objectives : We aimed to decrease the first-year post-transplant kidney rejection rate among pediatric patients to less than 10% through implementing several quality improvement initiatives. Furthermore, we sustain the improvements through ensuring continuous monitoring, reinforcing new protocols, and providing ongoing education and training for the healthcare team.
Methods : A root cause analysis was conducted, evaluating patient factors (e.g., age, immunological status, underlying disease) and surgical/perioperative factors (e.g., cold ischemia time, donor-recipient matching). Immunosuppression protocols were reviewed, and medication adherence was assessed. Quality improvement initiatives, such as establishing an Adolescent's Transplant Clinic, providing patient/family education, and restructuring the clinic, contributed significantly to decreasing the rejection rate.
Results : The number of pediatric kidney transplants has increased steadily from 2019 to 2023, while the rejection rate during the first-year post-transplant has decreased 50% from 15.8% in 2019 to 7.5% in 2023 (highest rejection rate was in adolescent age group 11-15 years). This suggests that the quality improvement measures implemented over the years have been effective in improving the outcomes of pediatric kidney transplants.
Conclusions : This quality improvement project focuses on reducing the first-year post-transplant kidney rejection rate among pediatric patients. By analyzing the data, identifying root causes, implementing targeted interventions, and continuously monitoring and evaluating the outcomes, we managed to reduce the rate of rejection aiming to improve the quality of care and long-term outcomes for this vulnerable patient population. Overall, the implementation of these small-scale changes and improvements in environmental care has led to significant improvements in patient outcomes and medication adherence. By establishing an Adolescent Transplant Clinic, increasing patient education, optimizing clinic operations, and enhancing support services, facilitate smooth transition of adolescent patients from pediatric-oriented care into adult-oriented care, we have successfully reduced the rate of rejection as these strategies has impacted positively on the patient care and medication adherence.

Image 21-02-1446 AH at 9.41 PM.JPG

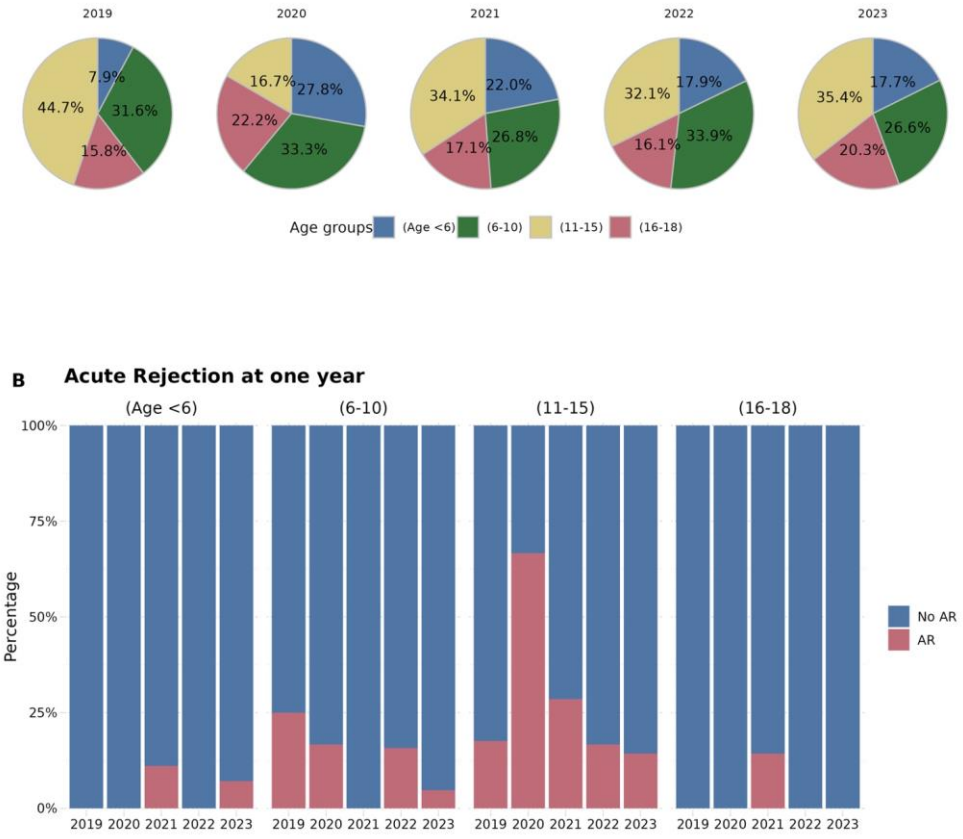

Figure 1. A) Pie charts of the distribution of patients' age group over the years. B) Distribution of acute rejection detected at one year by Years of transplant and age groups.

Abstract Submission No.: OP-0095

Sex differences in the risk of bladder cancer among kidney transplant recipients and patients with kidney failure receiving hemodialysis: a nationwide cohort study

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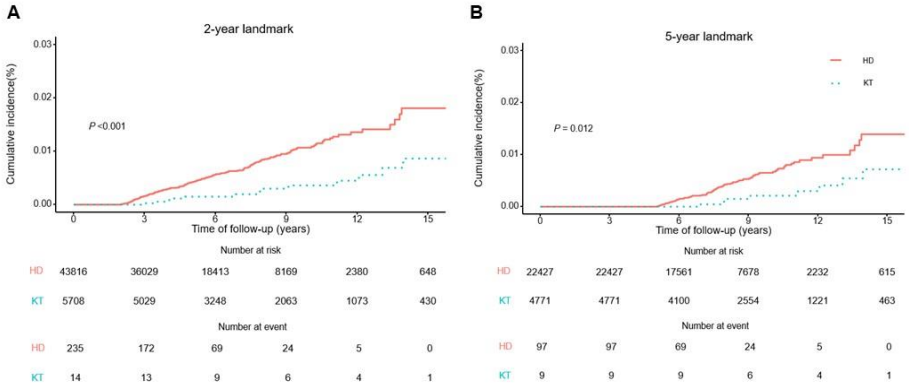
[1]Department of Nephrology, GangNeung Asan Hospital, Korea, Republic of
[2]Department of Urology, GangNeung Asan Hospital, Korea, Republic of
[3]Department of Hanmi, Hanmi Pharmaceutical, Korea, Republic of
[4]Department of Nephrology, Asan Medical Center, Korea, Republic of

Objectives : Although both patients with kidney failure (KF) receiving hemodialysis (HD) and kidney transplant (KT) recipients (KTRs) have a high risk of bladder cancer, how this risk changes in the transition from dialysis to KT is unknown. In this study, we aimed to investigate the risk of bladder cancer in KTRs and patients on HD.
Methods : This was a nationwide longitudinal cohort study of 66,547 participants from the National Health Insurance Service cohort who started HD for KF or received KT from 2002 to 2020. The primary outcome was the diagnosis of bladder cancer, which was defined as the composite of diagnostic codes and either hospitalization or ≥2 outpatient visits for bladder cancer.
Results : During mean follow-ups of 4.2 and 7.9 years in the HD and KT groups, respectively, the incidence rates of bladder cancer were 1.1/1,000 and 0.3/1,000 person-years, respectively. In the time-dependent multivariable Cox models, compared to patients on HD, the adjusted hazard ratio (aHR) for bladder cancer among KTRs was 0.36 (95% confidence interval [CI], 0.21–0.60; $p<0.001$). Among men, this aHR was 0.29 (95% CI, 0.15–0.55; $p<0.001$); however, no statistically significant association between the kidney replacement therapy modality and the risk of bladder cancer was observed among women. Landmark analysis performed to avoid immortal time bias by redefining time zero as a specific landmark time (2 and 5 years after HD initiation or KT) revealed similar results.
Conclusions : The risk of bladder cancer was significantly lower among KTRs than that among patients receiving HD, particularly among men.

Figure 1_jpg.jpg

Figure 1


A
2-year landmark
Cumulative incidence(%)
0.03
0.02
0.01
0.00
P <0.001
0
3
6
9
12
15
Time of follow-up (years)
Number at risk
HD 43816 36029 18413 8169 2380 648
KT 5708 5029 3248 2063 1073 430
Number at event
HD 235 172 69 24 5 0
KT 14 13 9 6 4 1
B
5-year landmark
HD
KT
Cumulative incidence(%)
0.03
0.02
0.01
0.00
P = 0.012
0
3
6
9
12
15
Time of follow-up (years)
Number at risk
HD 22427 22427 17561 7678 2232 615
KT 4771 4771 4100 2554 1221 463
Number at event
HD 97 97 69 24 5 0
KT 9 9 9 6 4 1

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 6
(Xenotransplantation)

Abstract Submission No.: OP-0291

Conditions and research status for primate non-clinical trials to initiate clinical trials for partial thickness corneal in Korea

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Objectives : Partial corneal transplantation uses the cornea of a transgenic pig, sufficient survival has already been proven in non-clinical primate studies even with minimal immunosuppression using steroids, equivalent to allograft transplantation. In this study, we will examine the current status of research to advance into clinical trials of partial corneal xenotransplantation.
Methods : Our research team's has performed 20 xenograft partial cornea transplants from 2016 to present using the corneas of transgenic pigs based on αGal-knockout(GTKO). Immunosuppression using steroids was administered in all cases, and there were 2 cases of knock-out(KO) alone, 10 cases of 1 knock-in(KI), and 8 cases of 2 KI.
Results : 5 of which were 1 membrane cofactor protein(CD46) KI, and 3 cases were 3 or more KO and 2 KI including thrombomodulin(TMB), so more transformation is helpful for survival. Of the 8 recent transplants, 3 had survival of more than 6 months, and 1 to 2 of them showed long-term transplant survival of more than 1 year. As three of the five recent cases were applicable, there seemed to be a high possibility that the conditions could be met as transplantation progresses in the future. Out of 8 cases, 5 or more cases showed survival for more than 6 months once between 2 and 9 times, and among all cases, there were 5 cases with long-term survival of more than 1 year.
Conclusions : Our results show that half of the have a long-term survival rate of more than 6 months. As the research currently underway to enter clinical trials is already using minimal immunosuppression therapy, serial primate experiments are being conducted to confirm additional survival records and block the infection route.

Abstract Submission No.: OP-0409

Comparion of the Opportunities and Challenges of Heart Xenotransplantation between US and China

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[2]Department of ITA, SIP-UCLA Institute for Technology Advancement, China
[3]Department of ClonOrgan, ClonOrgan Inc, China
[4]Department of Cardiac surgery, Gusu College of Nanjing Medical University , China

Case Study : Xenotransplantation research in China has been heated up since the two cases of heart Xenotransplation were operated in United States. ClonOrgan Inc is one of the leading companies which provides Xenotransplation organs for animal and pre-clinical trials in China, while Revivicor is another key players in United States. Both China and US have a huge demand for heart and kidney organs due to the large population of patients and less numbers of organ donors. However, China's Xenotransplantation policies for both research and pre-clinical trial are not clear yet. In the past 6 months, we did extenstive visit to most key players of Xenotransplation organ suppliers in both China and United States, we'd like to share some of the observations for the progresses, including opportunities and different challenges for Xenotransplation, especially in heart Xenotransplation, in both China and United States. We will also discuss some of the potential applications of biomaterials from Gene-edited pigs for other surgery areas, such as for orthopaedics.

Abstract Submission No.: VP-0141

Report of gene-edited pig-rhesus monkey heterotopic heart xenotransplantation experiment

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Objectives : To investigate the changing trends in cardiac function following xenogeneic heterotopic heart transplantation of multi-gene edited pig hearts and assess the impact of recipient immune responses on donor heart, laying experimental groundwork for the clinical application of gene editing technology.
Methods : On December 16, 2023, xenogeneic heterotopic heart transplantation was performed between pigs and rhesus monkeys. Functional status of the graft under post-transplantation load conditions and recipient immune indicators were observed.
Results : The recipient monkeys survived for 46 days with satisfactory functionality of both donor and recipient hearts, and no hyperacute or acute immune rejection reactions were observed.
Conclusions : This instance of xenograft heart transplantation accomplished functional donor-recipient heart transplantation, enabled the donor porcine heart to undertake parts of the pulmonary and somatic circulations, and explored the optimization of the immunization protocol for xenograft transplantation as well as the surgical protocol for xenograft heart transplantation. It also set the record for the longest survival time of cardiac xenotransplantation in China. Multi-gene editing technology provides potential for xenotransplantation, yet further exploration is needed for its clinical application

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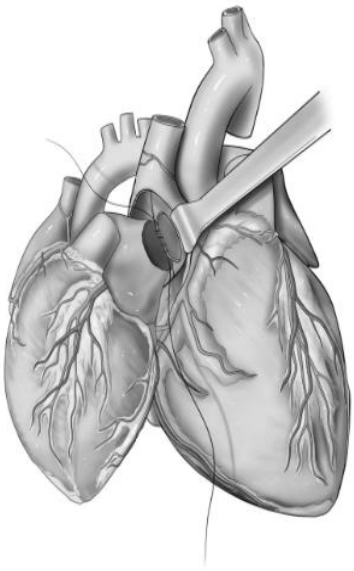

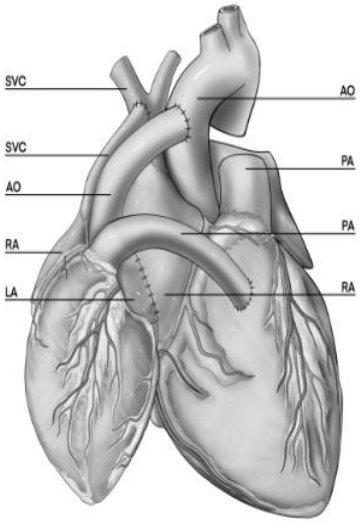
SVC
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Abstract Submission No.: OP-0300

The first more than 6 months survival of pig to monkey xeno heart transplantation in Korea

Hun Keun Chee, **IK JIN YUN**, Jun Seok Kim, Sun Ae Hwang
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Objectives : For the initiation of clinical trial, minimal survival date of pig to monkey xeno heart transplantation is 6 month. Although this survival is on the condition of orthotopic transplantation, but immunologically, the heterotopic heart transplantation also should overcome the period of 6 month to confirm the efficacy of xenograft. In our research group, we firstly get over the period of 6 month survival and report it.
Methods : In 16th Feb 2024, we performed pig to monkey xeno heart transplantation. Type of heart transplantation is heterotopic heart transplantation which is vascular anastomosis with the abdominal aorta and IVC. The transgenic type of pig is QKO(GGTA1/CMAH/iGb3s/B4GalNT2)+iCD46+TBM. The weight of donor pig is 4.5kg and the heart is 40g. Recipient is rhesus monkey and the weight is 4.5 kg. Cold ischemic time is 79 minutes. We use the immunosuppressants of anti-CD 154 + Rituximab + ATG + Advagraft + MMF + solumedrol + Abatacept. As for the anticoagulation, Cobra venom factor + Aspirin + Enoxaparin is used. For anti-inflammatory agents, Etanercept was used and as for the hemopoietic factor, Erythropoietin was used.
Results : Until today, 190 days survival is recorded. We check the survival of transplanted heart by pulsation of heart in money abdomen. We check the echocardiogram at POD 8, POD 17, POD 82 and POD 150, and find the viability of transplanted heart. The blood chemistry and hematology including heart function profile just like CK, LDH and troponin I is stable until now.
Conclusions : For the initiation of clinical application of xeno heart transplantation, the satisfaction of survival date is the first step and most important condition should be performed. Although orthotopic transplantation survival should be rated for the conditions for the clinical trial, the meaning of heterotopic heart transplantation survival is also very important coordinate for the achievement of xenotransplantation.

Abstract Submission No.: OP-0143

The Impact of COVID-19 Vaccination and Infection on Anti-triple-knockout Pig Antibodies in End-stage Liver Disease Patients

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[2]Department of NHFPC Key Laboratory of Combined Multi-Organ Transplantation, Institute of Organ Transplantation, Zhejiang University, China
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[7]Department of Department of Hepatobiliary & Pancreatic Surgery and Minimally Invasive Surgery, Zhejiang Provincial People's Hospital, Affiliated People's Hospital, Hangzhou Medical College, China

Objectives : Gene-modified pigs have helped overcome hyperacute rejection in xenotransplantation, yet antibody-mediated rejection remains a major barrier to long-term xenograft survival. Vaccination has been shown to influence anti-pig antibody production. The COVID-19 pandemic led to widespread use of inactivated vaccines in China. This study examined how inactivated COVID-19 vaccines affected anti-triple-knockout (TKO) pig antibodies, important for xenotransplantation.
Methods : Serum samples were collected from 57 healthy human (HH) volunteers, 24 end-stage liver disease (ESLD) patients, and 28 liver transplant (LT) recipients. Anti-SARS-CoV-2 IgM/IgG levels were measured by chemiluminescence, and antibody binding and complement-dependent cytotoxicity (CDC) to TKO pig peripheral blood mononuclear cells (PBMCs) were assessed by flow cytometry.
Results : HH had lower anti-TKO pig antibodies than ESLD patients (IgM/IgG: $p<0.05$) and LT recipients (IgG: $p<0.05$). ESLD patients had higher anti-TKO pig IgM than LT recipients ($p<0.001$). No significant differences were observed in CDC to TKO PBMCs among the three groups. In HH, anti-SARS-CoV-2 IgG did not correlate with anti-TKO pig IgG or CDC. However, ESLD patients with positive anti-SARS-CoV-2 IgG showed positive correlations between anti-SARS-CoV-2 IgG and anti-TKO pig IgM/IgG ($p<0.05$, $R^2=0.35/0.33$), as well as CDC to TKO PBMCs ($p<0.01$, $R^2=0.46$). LT recipients with active COVID-19 had higher anti-TKO pig IgG ($p<0.01$).
Conclusions : These findings suggest that COVID-19 vaccination (with inactivated vaccines) and infection may modulate anti-TKO pig antibody production in ESLD patients. This highlights the importance of closely monitoring anti-pig antibody levels in potential xenotransplant recipients post-

COVID-19 vaccination or infection and the need for further research to optimize xenotransplantation protocols in the post-pandemic era.

Fig.1 with figure legend.jpg

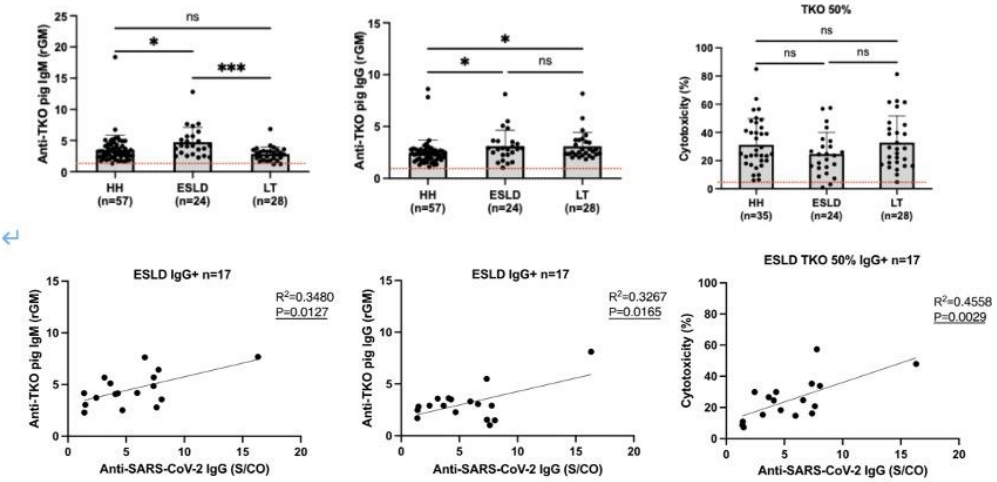

Figure:

(A) Comparison of antibody binding and complement-dependent cytotoxicity (CDC) to TKO pig PBMCs among healthy human (HH) volunteers, end-stage liver disease (ESLD) patients, and liver transplant (LT) recipients.

(B) Correlations between antibody binding, CDC to TKO pig PBMCs, and anti-SARS-CoV-2 IgG levels in ESLD patients with positive anti-SARS-CoV-2 IgG antibodies.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 7
(Liver)

Abstract Submission No.: OP-0061

More Than 6 Times of Pretransplant Therapeutic Plasma Exchange Increase the Recurrence of Hepatocellular Carcinoma in ABO-incompatible Living Donor Liver Transplantation

Young Jin Yoo[1], Deok-Gie Kim[1], Eun-Ki Min[1], Seung Hyuk Yim[2], Mun Chae Choi[1], Hwa-Hee Koh[1], Minyu Kang[1], Jae Geun Lee[1], Myoung Soo Kim[1], Dong Jin Joo[1]
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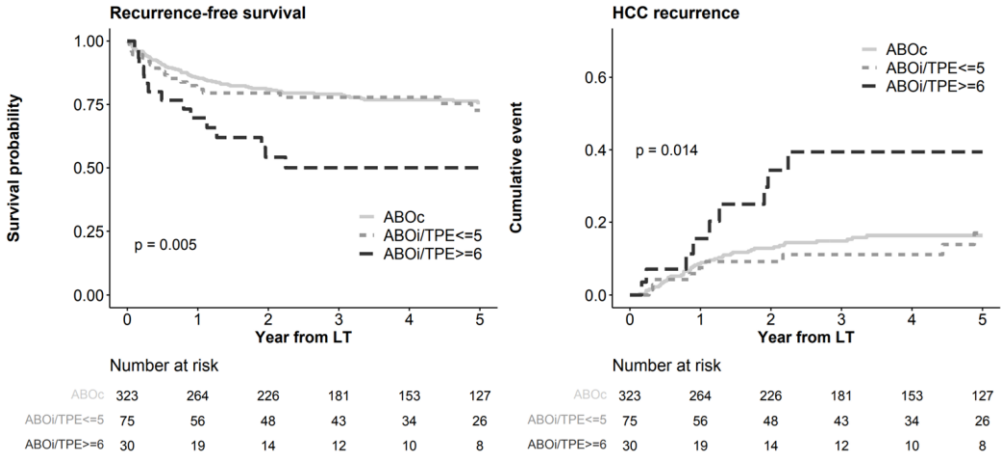
Objectives : Previous studies reported comparable oncologic outcome in ABO incompatible (ABOi) living donor liver transplantation (LDLT) with that in ABO compatible (ABOc) LDLT in hepatocellular carcinoma (HCC) patients. We aimed to analyze the relationship between the number of therapeutic plasma exchange (TPE) and HCC outcomes in ABOi LDLT.
Methods : In this single center retrospective study, 428 adult LDLT recipients with HCC were categorized into three groups according to ABO incompatibility and the number of pretransplant TPE, of which cutoff was more than 6 times, determined from cubic spline model for recurrence-free survival (RFS); ABOc (n=323), ABOi/TPE≤5 (n=75), and ABOi/TPE≥6 (n=30). RFS and HCC recurrence were compared with adjusting other risk factors for HCC outcomes.
Results : Three groups showed similar characteristics in most demographics, pretransplant tumor markers and tumor pathologies. The median of isoagglutinin(IA) titer at initial was 1:64 (range negative-1:512) in the ABOi/TPE≤5 group and 1:512 (range 1:128-1:4096) in ABOi/TPE≥6 group. Five-year RFS was significantly lower (75.7% in the ABOc group vs. 72.7% in the ABOi/TPE≤5 group vs. 50.0% in the ABOi/TPE≥6, P=0.005) and HCC recurrence was significantly higher in the ABOi/TPE≥6 group than the others (16.4% vs. 17.0% vs. 39.4%, P=0.014). In multivariable Cox regression, ABOi/TPE≥6 was independent risk factor for RFS (aHR 1.99, 95% CI 1.02-3.86, P=0.042) and HCC recurrence (aHR 2.42, 95% CI 1.05-5.57, P=0.037).
Conclusions : More than 6 times of pretransplant TPE has a potential of higher HCC recurrence after ABOi LDLT. Strategy to reduce the number of TPE less than 5 would be needed when planning ABOi LDLT for HCC patients, ensuring similar immunologic risk.

ABOi_LDLT_KMCurve.png



Number at risk

ABOc	323	264	226	181	153	127
ABOi/TPE<=5	75	56	48	43	34	26
ABOi/TPE>=6	30	19	14	12	10	8

Number at risk

ABOc	323	264	226	181	153	127
ABOi/TPE<=5	75	56	48	43	34	26
ABOi/TPE>=6	30	19	14	12	10	8

Abstract Submission No.: OP-0308

Comparison of pure laparoscopic donor left hepatectomy and pure laparoscopic donor right hepatectomy in terms of donor safety and recipient outcome

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Objectives : Pure laparoscopic donor hepatectomy (PLDH) is increasingly becoming the standard for donor surgery. However, pure laparoscopic donor left hepatectomy (PLDLH) is not yet more widely performed than pure laparoscopic donor right hepatectomy (PLDRH). This study is performed to evaluate safety and feasibility of PLDLH.
Methods : From March 2019 to September 2023, PLDH was performed on 124 patients at our center. Among them, 11 patients underwent PLDLH for extended left lobe (ELL) graft without caudate, and 113 patients underwent PLDRH for modified right lobe (MRL) graft. In these two groups, donor safety was first compared, and then, the recipient outcomes were compared according to the type of graft. The medical records of PLDH at Seoul St. Mary's Hospital were retrospectively reviewed.
Results : The PLDLH group had 10 men (90.9%), which was higher than the PLDRH (48.5%) group. There was no difference in preoperative BMI, liver function test, bile duct and portal vein variation between the two groups. The operation time was longer in the PLDLH group, but there was no difference in ischemic time. There was no difference in complications of Clavien-Dindo III or higher, such as bile leak. However, the peak level of total bilirubin and PT INR after surgery was lower in the PLDLH group, and the total bilirubin level on the postoperative day 5 was also lower in the PLDLH group. There was no difference in recipient outcome between PLDLH and PLDRH.
Conclusions : In the laparoscopic era, PLDLH can be performed as safely as PLDRH, and the recipient outcomes are similar. PLDLH appears to have an advantage in terms of donor recovery after surgery.

Abstract Submission No.: OP-0010

Comparative Analysis of Anastomosis Methods for Dual Portal Vein Right Lobe Grafts in Living Donor Liver Transplantation

Hyun Hwa Choi[1], Suk Kyun Hong[2], Jae-Yoon Kim[2], Jeong-Moo Lee[2], YoungRok Choi[2], Nam-Joon Lee[2], Kwang-Woong Lee[2], Kyung-Suk Suh[2]
[1]Department of Hepatobiliary and Pancreatic Surgery, Eulji University Hospital, Korea, Republic of
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Objectives : Living donor liver transplantation (LDLT) using right liver grafts with dual portal veins (PVs) presents significant surgical challenges, requiring advanced portal vein anastomosis techniques such as Y-graft interposition, direct venoplasty, and patch grafting to ensure optimal transplantation outcomes.
Methods : A retrospective analysis was conducted on 111 cases of LDLT with dual portal veins performed at a single center between January 2011 and December 2020. The cases were divided into three groups based on the dual PVs anastomosis technique: Y-graft interposition, direct venoplasty, and patch grafting. For anatomical evaluation of the angle between the right anterior posterior portal vein (RAPV) and right posterior portal vein (RPPV), donor MRI was used, and the distance between them was directly measured during the bench operation.
Results : Significant differences were observed among the dual PV anastomosis methods in terms of RAPV-RPPV distance and angle. Direct venoplasty was preferred when the distance was shorter and the angle more acute, while patch graft was preferred when the distance was greater and the angle more obtuse ($p < .001$). Distances: Y-graft (9.6 ± 2.3 mm), direct venoplasty (7.9 ± 2.4 mm), patch graft (11.5 ± 1.9 mm). Angles: Y-graft (64.1 ± 19.2°), direct venoplasty (56.4 ± 15.7°), patch graft (84.0 ± 14.8°). The 50-month postoperative survival rates were 100% for the patch graft group, 97% for the Y-graft group, and 89% for the direct venoplasty group, with no statistically significant differences observed. However, a significant difference was noted based on PV intervention. At 100 months post-transplant, patients without PV intervention had a 100% survival rate, while those with PV intervention had an 80% survival rate ($p = 0.014$).
Conclusions : The anatomical relationship between RAPV and RPPV in LDLT is crucial for selecting the surgical approach, emphasizing the careful consideration of dual PV anastomosis methods based on this relationship.

Figure1.JPG

Figure 1. Bench Management Techniques for Dual Right Portal Vein Grafts in LDLT. A) Y-Graft Interposition Method. The Y-graft, sourced from the recipient's portal vein bifurcation or a vein allograft, is resected with 1.5- to 2-cm-long Y-limbs. The dual portal veins of the graft are anastomosed to the recipient's portal branches using the Y-graft. **B) Direct Venoplasty Method.** The right anterior portal branch of the graft is anastomosed to the side wall of the right posterior portal vein, creating a direct connection between the right anterior and posterior portal veins. **C) Patch Graft Method.** A suitable venous graft, often from the greater saphenous vein or portal vein, is harvested to serve as an interposition conduit. A large conduit is used to create a funnel-shaped interposition between the donor and recipient portal veins.

Table 1. Comparison of Groups Based on 2 Portal Vein Anastomosis Methods.

Variables	Y-graft n = 39 (35.1%)	Direct venoplasty n = 62 (55.9%)	Patch graft n = 10 (9.0%)	*p* value†
Graft factors				
RAPV diameter (mm)	6.4 ± 1.3	6.3 ± 1.3	6.8 ± 1.2	0.478
RPPV diameter (mm)	7.1 ± 1.6	6.2 ± 1.2	6.3 ± 1.1	0.002*
Length between RAPV and RPPV (mm) Axial view	9.6 ± 2.3	7.9 ± 2.4	11.5 ± 1.9	<.001*
Length between RAPV and RPPV (mm) Coronary view	11.1 ± 2.7	8.4 ± 2.9	12.9 ± 1.8	<.001*
Angle between RAPV and RPPV Axial view	64.1 ± 19.2	56.4 ± 15.7	84.0 ± 14.8	<.001*
Angle between RAPV and RPPV Coronary view	67.7 ± 19.8	50.3 ± 15.7	80.7 ± 12.4	<.001*
Operation factors				
Recipient operation time (min)	449.4 ± 91.2	384.9 ± 97.7	456.2 ± 88.1	0.002*
Bench operation time (min)	110.2 ± 35.1	102.4 ± 38.9	143.3 ± 44.4	0.014*
PV anastomosis time (min)	8.9 ± 4.3	10.8 ± 5.0	8.9 ± 3.3	0.141
Shunt ligation	2 (1.8%)	0 (0.0%)	0 (0.0%)	0.153
Splenectomy	1 (0.9%)	1 (0.9%)	0 (0.0%)	0.851
Thrombectomy	13 (11.7%)	8 (7.2%)	2 (1.8%)	0.048*
Postoperative factors				
Hospital stay (d)	8.2 ± 2.1	7.8 ± 3.4	6.5 ± 1.7	0.254
CD complication	28 (25.2%)	54 (48.6%)	8 (7.2%)	0.161
Major CD complication	27 (24.3%)	47 (42.3%)	6 (5.4%)	0.519
PV complication	19 (17.1%)	17 (15.3%)	5 (4.5%)	0.065
Major PV complication	10 (9.0%)	5 (4.5%)	1 (0.9%)	0.284

n, number; RAPV, right anterior portal vein; RPPV, right posterior portal vein; PV, portal vein.

Values are presented as number (number% each group), mean ± standard deviation.

†Kruskal-Wallis test.

*p <0.05.

Abstract Submission No.: OP-0104

Severity and pattern of bile duct complications after donor right hepatectomy: Open versus minimally invasive approaches

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Objectives : Bile duct division in living donor hepatectomy is a critical step that can lead to major postoperative complications. Minimally invasive donor right hepatectomy (MIDRH) has recently become popular worldwide. However, due to technical limitations, the bile duct division in MIDRH differs from that in open donor right hepatectomy (ODRH). This study aimed to compare the patterns of donor biliary complications between MIDRH and ODRH.
Methods : This retrospective, single-center study included 272 and 319 donors who underwent MIDRH and ODRH, respectively, between March 2016 and June 2014. Bile duct division was performed using the "cut and suture" method in ODRH and "clip and cut" in MIDRH. Bile duct complications in donors were categorized into biliary leakage (stump, resection margin) and stricture. The management of bile duct complications was analyzed in detail.
Results : The overall biliary complication rates were similar between the groups (MIDRH 6.6% vs ODRH 7.8%, P= 0.569). However, grade II or higher complications requiring management were significantly more common in MIDRH (4.8% vs 1.9%, P= 0.046). MIDRH tended to have higher rates of major complications (≥ Grade III) than ODRH, though not statistically significant (3.7% vs 1.6%, P= 0.104). Minor complications not requiring management were significantly lower in MIDRH (1.8% vs. 6.0%, P= 0.014).
Conclusions : MIDRH showed a comparable overall biliary complication rate to ODRH but with greater severity. We suggest that the current bile duct division method in MIDRH requires technical refinement in several aspects.

Abstract Submission No.: OP-0105

A Single-center Experience of Cytomegalovirus Infection in Pediatric Liver Transplant Recipients in Korea

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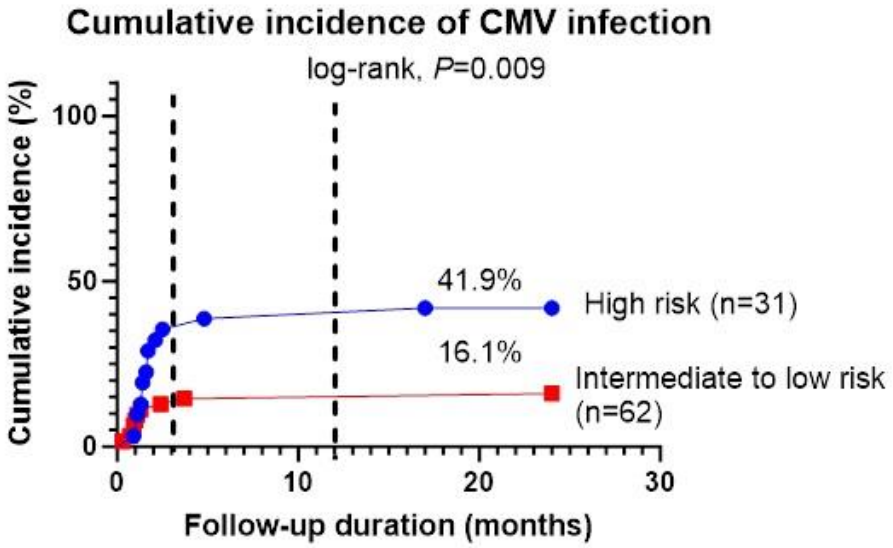
[2]Department of Surgery, Division of Transplant Surgery, Yonsei University College of Medicine, Korea, Republic of

Objectives : While prophylaxis in high risk serostatus group for cytomegalovirus (CMV) infection is recommended in liver transplant (LT) recipients, due to inaccessibility of oral valganciclovir as syrup formation in Korea, pre-emptive therapy is more widely used for pediatric LT recipients. We aimed to investigate the incidence of CMV infection at our center, and compare the incidence rates according to serostatus risk groups.
Methods : This is a retrospective cohort study on children who received LT below the age of 19 years old between 2012 to 2023 at Severance Children's Hospital, Korea. CMV infection was defined as the detection of viral nucleic acid in body fluid or tissue and DNAemia was defined as the detection of CMV DNA in plasma. Preemptive ganciclovir treatment was initiated when the plasma titer exceeded 2,000 IU/ml. High risk serostatus group included D+/R- and D+/R+ below the age of 1, and was compared to intermediate risk (D+/R+ ≥1 year, D-/R+) and low risk (D-/R-) group. Primary outcome was the occurrence of CMV infection and secondary outcome was the difference in incidence according to serostatus risk groups.
Results : 117 LT recipients (126 cases) were included, among which 43.6% were male. The median age at LT was 2.4 years old. After excluding DNAemia episodes that did not require antiviral treatment (n=4), 30 CMV infection episodes in 23 recipients were included with an overall incidence of 23.8%. When only the recipients with known donor serostatus were analyzed (n=93), high risk serostatus group experienced almost 2.6-fold higher 1-year cumulative incidence rate compared to intermediate and low risk group (41.9% vs. 16.1%, P=0.009, Figure 1).
Conclusions : High risk serostatus group for CMV exhibited higher incidence of CMV infection in pediatric LT recipients. As oral valganciclovir has recently become available in Korea, prophylaxis in this group should be considered.

Figure 1.jpg


Cumulative incidence of CMV infection
log-rank, P=0.009
Cumulative incidence (%)
100
50
0
0
10
20
30
Follow-up duration (months)
41.9%
High risk (n=31)
16.1%
Intermediate to low risk
(n=62)

Abstract Submission No.: OP-0436

Salvage LD-RAPID Procedure Using Extended Left Liver with Caudate Lobe Graft for Recurrent Hepatocellular Carcinoma: A Case Study

Sehyeon Yu, Hye-Sung JO, Young-Dong YU, Sang Jin Kim, Su Min Jeon, Dong-Sik Kim
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Objectives : The living donor hepatectomy and partial liver segment 2-4 liver transplantation with delayed total hepatectomy (LD-RAPID) procedure is a new surgical strategy in living donor liver transplantation. LD-RAPID could mitigate the risk of developing the fatal small-for-size syndrome and expand the donor pool. Here, we report a successful case of LD-RAPID procedure using an extended left liver with a caudate lobe graft for recurrent hepatocellular carcinoma (HCC).
Methods : A 58-year-old male patient underwent right anterior sectionectomy for hepatitis B virus-related hepatocellular carcinoma (HCC). After surgery, viable tumors continued to recur despite four times of transarterial chemoembolization. The only available donor was a 48-year-old woman whose left liver with caudate lobe graft represented 33.0% of the total liver volume, resulting in a graft-to-recipient weight ratio (GRWR) of only 0.48. We therefore planned a salvage LD-RAPID procedure.
Results : Donor surgery was performed using a pure laparoscopic approach. The actual GRWR was 0.52. In the recipient surgery, right portal vein was ligated after left hemihepatectomy. Vascular reconstruction was performed using the recipient's middle-left hepatic vein stump and left portal vein. We assessed portal hemodynamics to determine the need for portal modulation. The hepatic venous pressure gradient was 8 mmHg, and a portal flow was 244 ml/min/100g liver weight, leading to the decision to perform splenic artery ligation. Following confirmation of adequate volumetric regeneration of the graft, a complete right posterior sectionectomy was performed at POD 14. The patient was discharged without complications 14 days after the second stage operation.
Conclusions : Salvage LD-RAPID procedure could be a viable option for patients with recurrent HCC and no available donors with adequate GRWR, ensuring safe recovery for both donor and recipient. Careful intraoperative assessment of portal hemodynamics is essential to prevent small-for-size syndrome.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 8
(Liver / Other)

Abstract Submission No.: OP-0306

Korea's Journey in Hand Transplantation: Surgical Outcomes and Legal Framework

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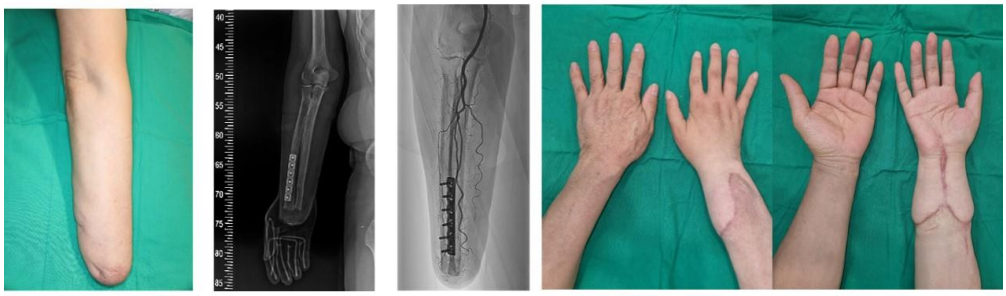
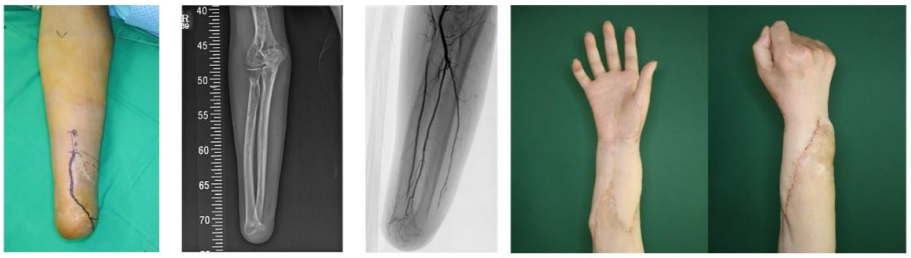
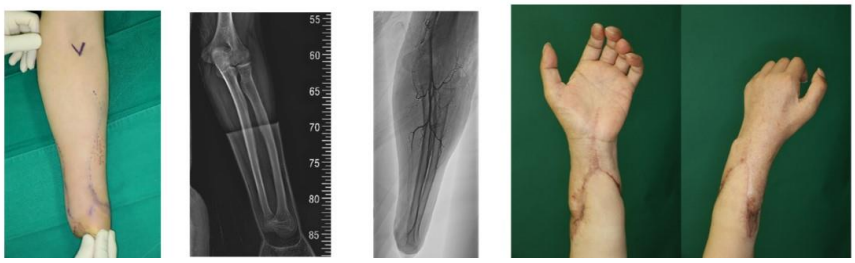
[2]Department of Orthopedic Surgery, Yonsei University College of Medicine, Korea, Republic of
[3]Department of Surgery, Division of Transplant Surgery, Yonsei University College of Medicine, Korea, Republic of
[4]Department of Organ Transplantation Center, Severance Hospital, Korea, Republic of

Objectives : Hand transplantation offers a unique reconstructive option for patients suffering from upper limb amputations, providing both functional restoration and psychological benefits. In South Korea, the practice of hand transplantation began in earnest following the amendment of the Organ Act in 2018. This study examines the clinical outcomes of hand transplantation cases conducted under the new legal framework, focusing on surgical procedures, immunosuppressive management, and postoperative care.
Methods : A retrospective study was conducted on three patients who underwent unilateral hand transplantation after the Organ Act amendment in 2018. The study involved an in-depth analysis of the surgical procedures, including donor and recipient preparation, transplantation techniques, and postoperative care strategies. Immunosuppressive regimens were also reviewed to assess their effectiveness in preventing rejection and promoting functional recovery. Additionally, rehabilitation protocols were evaluated to understand their impact on the recovery of motor and sensory functions.
Results : The surgeries were successfully executed, with all patients showing satisfactory recovery. Acute rejection episodes were noted in all cases within three months of transplantation but were effectively controlled with timely interventions, including steroid pulse therapy and adjustment of immunosuppressant levels. Sensory recovery was progressive, with patients regaining protective sensation and fine motor skills by four to five months post-transplantation. Functional assessments revealed significant improvements in activities of daily living, as measured by the DASH and HTSS scores. Patients reported high levels of satisfaction with the appearance and functionality of the transplanted hand, indicating positive psychological and social impacts.
Conclusions : This study suggest that hand transplantation is a promising reconstructive option. While the short-term outcomes are encouraging, with favorable functional recovery and patient satisfaction, further research is necessary to address long-term challenges, including chronic rejection and the side effects of immunosuppressive drugs. These insights are important for refining surgical techniques and postoperative management to enhance the future prospects of hand transplantation.

Hand transplantation 3 명 사진.jpg

Abstract Submission No.: OP-0261

A SUCCESSFUL CASE OF COORDINATION OF BRAIN DEAD DONOR WITH THE HIGHEST NUMBER OF ORGAN AND TISSUE TRANSPLANTATION IN VIETNAM: CASE REPORT AND REVIEW OF THE LITERATURE

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Objectives : The demand for organ transplantation is immense, and multi-organ donation from brain-dead or cardiac death donors is a global trend, particularly in Europe and America. National Organ Procurement Organizations play a crucial role in managing and maximizing the utilization of donated organs. This report presents a successful case of multi-organ donation and transplantation at the 108 Military Central Hospital, involving the procurement and transplantation of eight organs.
Methods : This is a retrospective clinical case report of a brain-dead organ donor who donated the most organs in Vietnam to date, according to current statistics, with a total of eight organs: one liver, two kidneys, one pancreas, one heart, one lung, two upper limbs, and two corneas in January 2024.
Results : The multi-organ donor was a 26-year-old male, treated at the Department of Surgical Intensive Care and Organ Transplantation at the 108 Military Central Hospital. After discussions and counseling, the family expressed their wish to donate the organs to save others. The National Organ Procurement Organization successfully coordinated the multi-organ retrieval at the 108 Military Central Hospital and the subsequent lung transplantation at the National Lung Hospital. The transport, organization, retrieval, and distribution of donated organs, as well as the transplantation procedures, were conducted smoothly and successfully at both the 108 Military Central Hospital and the National Lung Hospital. To date, all organ recipients have shown good progress.
Conclusions : The successful case of multi-organ donation and transplantation from a brain-dead donor, with a record number of transplanted organs coordinated by the National Organ Procurement Organization, demonstrates the effectiveness of organ donation and transplantation coordination in Vietnam, as well as the capability to master transplantation techniques.

Abstract Submission No.: OP-0414

Twenty-year follow-up after ligation of left renal vein for large spontaneous splenorenal shunt to prevent portal flow steal in adult living donor liver transplantation

Jihoon Kang, Shin Hwang, Deok-Bog Moon, Chul-Soo Ahn, Tae-Yong Ha, Gi-Won Song, Dong-Hwan Junh, Gil-Chun Park, Ki-Hun Kim, Woo-Hyoung Kang
Department of Surgery, Asan Medical Center, Korea, Republic of

Objectives : Persistance of a large spontaneous splenorenal shunt (SRS) can result in graft failure in adult living donor liver transplantation (LDLT) due to portal blood
Methods : We had performed a prospective study to evaluate the efficacy of ligation of the distal left renal vein (LRV). Between October 2001 and January 2005, 44 liver cirrhosis patients with large SRS underwent LDLT with distal LRV ligation. These patients were followed up until April 2024 or patient death to evaluate long-term outcomes of distal LRV ligation.
Results : Portal flow was significantly increased after distal LRV ligation. Renal function recovered uneventfully after LDLT in 40 patients. Of them. 18 patients died due to cancer recurrence (n=6), pneumonia (n=3), and other causes (n=9), thus 1-, 5-, 10- and 20-year overall patient survival rates were 95.5%, 86.4%, 81.8% and 59.1%, respectively. Three patients showed marked atrophy of both kidneys leading to end-stage renal disease, which was not associated with distal LRV ligation. Solitary atrophy of the left kidney was not identified. The LRV was reopened in four patients, in which retrograde intravenous obliteration was performed in two for each variceal bleeding control and portal flow augmentation. SRS was completely resolved in 20 patients, but another 20 patients showed persistently identifiable SRS of variable extents.
Conclusions : The results of this study demonstrated that distal LRV ligation is a safe effective method to prevent portal flow steal. Currently, direct ligation of the SRS at the level of proximal LRV has been preferred, but distal LRV ligation still can be a therapeutic option when direct access to SRS is not technically feasible.

Abstract Submission No.: OP-0399

Super-selection of Subgroups of Hepatocellular Carcinoma Patients at Minimal Risk of Recurrence for Liver Transplantation

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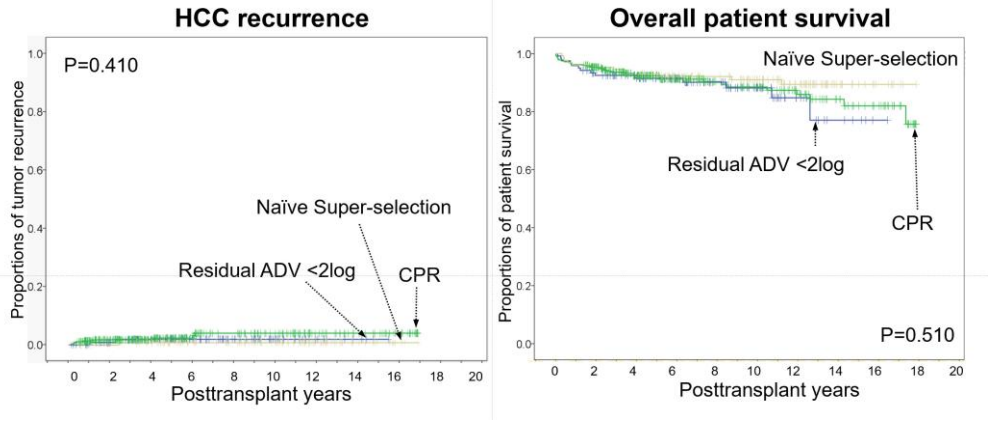
Department of Liver Transplantation and Hepatobiliary Surgery, Asan Medical Center, Korea, Republic of

Objectives : A majority of patients with hepatocellular carcinoma (HCC) undergoing liver transplantation (LT) meet the Milan criteria, but these are still regarded as the crude selection criteria for transplantation. Prognostic analysis of incidentally detected HCC after LT suggests that a subgroup of HCC patients is at minimal risk of recurrence.
Methods : To determine the criteria defining the super-selection groups, we retrospectively analyzed survival data of 2000 adult living-donor LT recipients with HCC in the explanted liver. This study includes three subgroups: the original super-selection group (naïve HCC of ≤ 2 tumors, tumors ≤ 2.0 cm in size, and AFP ≤ 10 ng/mL) (n = 128) , complete pathological response (CPR) group with no viable HCC portion after pretransplant HCC treatment (n = 322), and HCC patients with ADV score ≤ 2log (n = 121).
Results : Naïve super-selection group, CPR group and ADV score ≤ 2log group showed tumor recurrence rates as 0.8%, 1.0%, and 0.8% at 1 year, 1.6%, 2.6%, and 2.8% at 5 years, and 1.6%, 4.9%, and 2.8% at 10 years, respectively (p=0.410); overall patient survival rates as 96.1%, 96.3%, and 95.9% at 1 year, 92.9%, 92.3%, and 91.5% at 5 years, and 91.0%, 88.5%, and 88.2% at 10 years, respectively (p=0.510).
Conclusions : These three groups showed similar oncological outcomes with excellent posttransplant prognosis. These tumor features can be applicable for prediction of posttransplant prognosis and development of cost-effective post-transplantation HCC surveillance protocols.

1.jpg


HCC recurrence
P=0.410
Proportions of tumor recurrence
Naïve Super-selection
Residual ADV <2log
CPR
Posttransplant years
Overall patient survival
Naïve Super-selection
Residual ADV <2log
CPR
P=0.510
Proportions of patient survival
Posttransplant years

Abstract Submission No.: OP-0235

Long-term Outcomes of Combined Hepatocellular Carcinoma-Cholangiocarcinoma Following Liver Transplantation

MINHA CHOI, Hwang Shin, Chul-Soo Ahn, Deok-Bok Moon, Tae-Yong Ha, Gi-Won Song, Gil-Chun Park, Ki-Hun Kim, Woo-Hyoung Kang, Young-In Yoon
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Case Study : Combined hepatocellular carcinoma and cholangiocarcinoma (cHCC-CC) is a rare disease. We investigated the clinicopathological features of cHCC-CC and compared the long-term outcomes following liver transplantation (LT). We identified 60 LT patients with cHCC-CC through an institutional database search. The incidence of cHCC-CC among all adult LT cases was 1.0%. Living-donor and deceased-donor LTs occupied 57 cases (95%) and 3 cases (5%), respectively. Mean patient age was 53.3±7.0 years and 51 patients (85.0%) were male. Fifty-thee patients (88.3%) had hepatitis B virus infection. The majority of these patients were diagnosed incidentally in the explanted livers. Mean tumor diameter was 2.5±1.7 cm and 49 patients had single tumors. Concurrent viable HCC was detected in 23 patients (38.3%) and mean tumor diameter was 2.8±2.7 cm and 10 had single tumors. Various locoregional treatments targeting HCC were performed in 41 patients (68.3%). Tumor recurrence and survival rates were 20.5% and 86.4% at 1 year, 29.3% and 57.9% at 5 years, and 35.4% and 50.9% at 10 years, respectively. All patient with tumor recurrence have died and the median post-recurrence survival period was 6.1 months. Patients with very early stage cHCC-CC (one or two tumors ≤2.0 cm) showed tumor recurrence of 11.5% and patient survival rates of 75.8% at 5 years, which were significantly improved than those with advanced tumors (p=0.002). In conclusion, cHCC-CC is rarely diagnosed following LT and more than one-third of such patients have concurrent viable HCC. Close tumor surveillance is highly recommended due to high tumor recurrence rate and high mortality rate, especially in patients with cHCC-CC exceeding the very early stage.

Survival curve of cHCC-HCC after LT.jpg

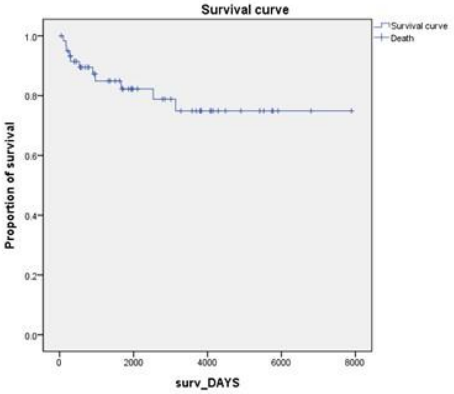

Figure 1. Overall survival

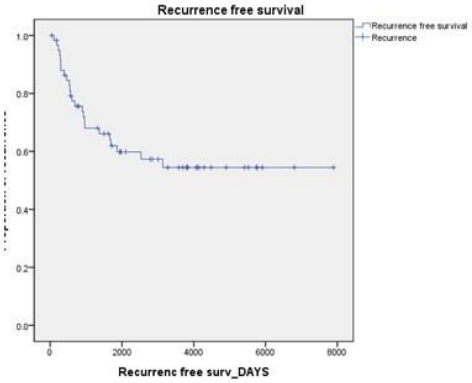

Figure 2. Recurrence free survival

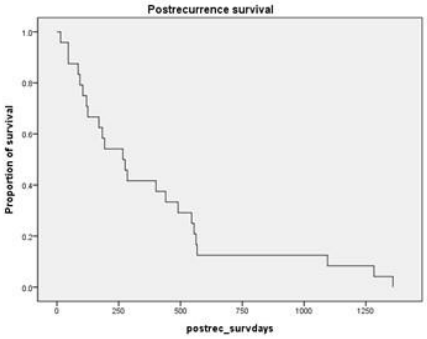

Figure 3. Post recurrence survival

Abstract Submission No.: VP-0004

How to Implant Modified Right Lobe Graft having V5, V8, and Inferior Right Hepatic Vein to Situs Inversus Recipient

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Case Study : Situs inversus totalis (SIT) is a rare congenital anomaly in which the major visceral organs are reversed from their normal positions. Considering living donor liver transplantation (LDLT) using a modified right lobe (mRL) graft in an SIT recipient presents a significant challenge regarding graft placement and vessel reconstruction. For the first time, we reported "A novel technique of LDLT using an mRL graft from an SIT donor in a conventional recipient." Here, despite the anatomical reversal in the SIT recipient, we successfully performed mRL LDLT by applying the same concept of operative procedures. The SIT recipient had HBV cirrhosis, while the donor had normal anatomy. We procured an mRL graft with one V5, one V8, and two IRHV openings. The graft was placed in the left upper quadrant (LUQ) and rotated clockwise about 150 degrees along the axis of the IVC groove. Additionally, it was rotated upward about 80 degrees along the coronal axis to create an imaginary new axis. The IRHVs, located on the most ventral side of the graft, were anastomosed to the umbilical vein harvested from the recipient, with the other end anastomosed to the RHV and V8 to create a large single orifice. The most dorsally placed V5, fenced with cryopreserved IVC, was anastomosed to the recipient's IVC. The new axis between the RHV and V5 is similar to the IVC groove of the conventional mRL graft. Duct-to-duct anastomosis was performed prior to the portal vein anastomosis because the donor’s bile duct opening was located on the dorsal side of the hilum. One year after LDLT, graft function has been maintained well without complications. From this case and previously reported cases, we suggest that our novel surgical strategy should be universally applied for successful LDLT using an SIT donor and/or recipient.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 9
(Kidney / Pancreas)

Abstract Submission No.: OP-0101

Prediction of Recipient Renal Function in Living Donor Kidney Transplantation Using Baseline Characteristics and Donor Kidney Volume

Jayeon Ahn[1], Myeonghyeon Ko[1], Sangwan Kim[2], Juhan Lee[3], Minyu Kang[3], Yong Chul Kim[4], Ahram Han[1], Jongwon Ha[1], Sangil Min[1]
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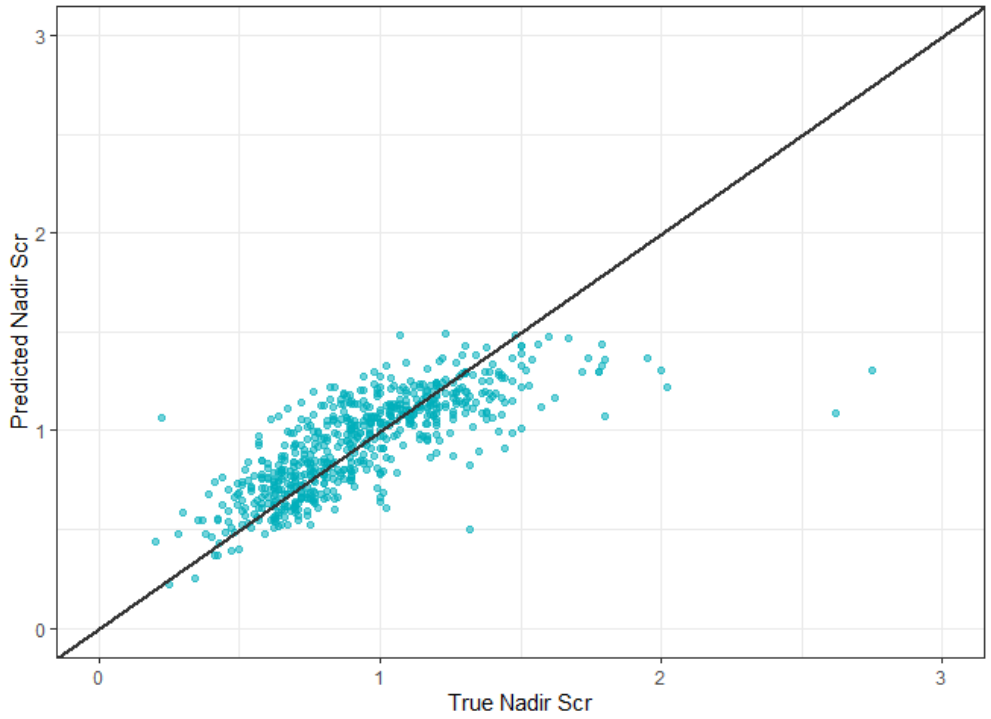
[2]Department of Institute of Health Policy and Management, Seoul National University Medical Research Center, Korea, Republic of
[3]Department of Surgery, Division of Transplant Surgery, Yonsei University College of Medicine, Korea, Republic of
[4]Department of Internal Medicine, Seoul National University College of Medicine, Korea, Republic of

Objectives : Kidney transplantation is the definitive treatment for end-stage renal disease, with living donor transplants offering advantages over deceased donors, particularly in reducing mortality from delayed graft function. Precise prediction of post-transplant outcomes is critical for optimizing treatment strategies and ensuring long-term kidney function. This study aimed to develop a predictive model for post-transplant renal function by evaluating pre-transplant baseline characteristics of recipients and donors, including donor kidney volume.
Methods : We conducted a retrospective cohort study involving 3,162 adult patients who underwent living donor kidney transplants at Seoul National University Hospital (2010-2022) and Severance Hospital (2006-2023). Donor kidney volume was measured using commercial software (Oncostudio, Oncosoft Inc, Seoul, Korea), and cortical volume was assessed via an automated 3D U-Net model. The primary endpoint was defined as the best creatinine level within one year post-transplantation. Patients were randomly assigned to training (80%) or test sets (20%).The predictive modeling employed various machine learning algorithms, including multiple linear regression, Elastic Net, Generalized Additive Model (GAM), Random Forest, Gradient Boosting, and eXtreme Gradient Boosting (Xgboost). Model performance on the test set was evaluated using Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and R-squared.
Results : Key predictive factors identified from the regression analysis encompassed recipient age, sex, height, body surface area, presence of diabetes, as well as donor age, sex, height, eGFR, whole kidney volume, cortex volume, and the donor-recipient relationship. GAM had the lowest MAE (0.1427), while Xgboost had the lowest RMSE (0.2020) and highest R-squared (0.5936). Xgboost and GAM consistently outperformed other models. Incorporating donor kidney volume improved the accuracy of predicting post-transplant renal function.
Conclusions : Donor kidney volumes are crucial for predicting post-transplant renal function. Their inclusion significantly enhanced model accuracy, highlighting the need for external validation to confirm the models' clinical applicability.

Comparison of Predicted vs. True Nadir Serum Creatinine Levels Using XgBoost Model.png


Predicted Nadir Scr
True Nadir Scr
0
1
2
3

Abstract Submission No.: OP-0145

Late antibody-mediated rejection with inferior allograft prognosis compared with early rejection: A single-center study

Huanxi Zhang, Jinghong Tan, Wenrui Wu, Wing Keung Yiu, Wenyu Xie, Lin Lang, Changxi Wang
Department of Organ Transplant Center, First affiliated hospital of Sun Yet-sen University, China

Objectives : In 2019, the Transplantation Society expert consensus focused on early rejection within 30 days post-transplantation, with aggressive allograft function deterioration induced by preexisting antibody. Few studies have systematically compared the clinical characteristics and long-term allograft prognosis between early and late rejection.
Methods : We retrospectively included 114 recipients who underwent allograft biopsy at our center from 2014 to 2022 and were diagnosed with ABMR based on the Banff 2019 criteria. The cohort was stratified into early rejection (n = 16, 14%) and late rejection (n = 98, 86%). Pre-existing antibodies were defined as preoperative positive panel reactive antibodies (PRA) or donor-specific antibodies. Allograft prognosis was compared between different types of ABMR.
Results : Late rejection was characterized by more severe chronic lesions (cg:0.68±1.07 vs 0.06±0.25, p = 0.023; ci: 1.32±0.62 vs 0.56±0.73, p<0.001; ct: 1.31±0.67 vs 0.69±0.70, p = 0.001) than early rejection. Allograft survival rates were markedly diminished in late rejection compared to early rejection (Two-year: 81.8% [74.0% - 94.0%] vs 100%, p = 0.017). Recipients with late rejection exhibited significantly poorer allograft outcomes in terms of two-year eGFR (40.63 [2.98 - 55.86] vs 68.6 [44.17 - 79.69], p = 0.001) and two-year change in eGFR from rejection (-3.52 [-21.36 - 4.84] vs 20.88 [-1.24 - 42.26], p < 0.001) compared to recipients with early rejection. Similar adverse outcomes were noted in early and late rejection with preexisting antibodies. After adjusted by preexisting antibody, later rejection was independent for poorer two-year eGFR (coefficient -36.9, 95%CI -58.6 - -15.1, p = 0.001) and two-year change in eGFR from rejection (coefficient -31.3, 95%CI -51.8 - -10.8, p = 0.003).
Conclusions : Preexisting antibodies predominantly contribute to early rejection, while late rejection is associated with significantly worse allograft prognosis than early rejection. Regular testing of PRA is valuable for early detection of antibody-mediated rejection.

Abstract Submission No.: OP-0284

Efficacy and safety of rATG for inductive agent in ABO incompatible living donor kidney transplantation

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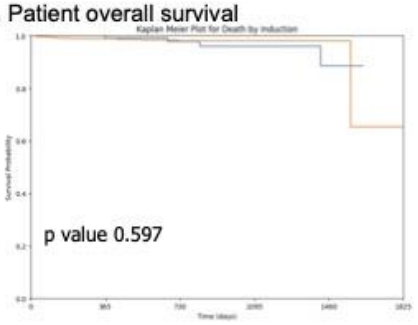
[6]Department of Surgery, Severance Hospital, Korea, Republic of

Objectives : In ABO incompatible kidney transplants (ABOi KT), which present a high immunologic risk, appropriate induction therapy is important. However, there is limited evidence on the appropriate induction agent for ABOi KT. This study compares the effectiveness and safety of rabbit anti-thymocyte globulin (rATG) and basiliximab as induction agents in ABOi KT.
Methods : We retrospectively analyzed outcomes of 818 patients who underwent ABOi KT receiving induction agents either rATG or basiliximab from extensive data from the Korean Organ Transplantation Registry (KOTRY). Of these, 666 patients received basiliximab and 152 received rATG as induction therapy. Effectiveness was measured by death-censored graft survival and rejection-free survival, while safety was assessed through overall survival, infection-free survival, and malignancy-free survival. Statistical analyses were performed using Kaplan-Meier plots, Cox proportional hazards models, and various univariate and multivariate analyses.
Results : No significant differences were observed between the basiliximab and rATG groups in terms of death-censored graft survival ($p = 0.208$), rejection-free survival ($p = 0.296$), and patient overall survival (1.7% vs. 2.6%, $p = 0.597$). Additionally, there were no notable differences in infection rates, infection-free survival, or malignancy-free survival between the two groups. The use of rATG did not significantly increase the risk of graft failure, rejection, infection, or malignancy compared to basiliximab.
Conclusions : Both rATG and basiliximab demonstrated comparable effectiveness and safety profiles in ABOi KT. These findings suggest that rATG may be a viable alternative to basiliximab for induction therapy in patients undergoing ABOi KT. Further studies are needed to confirm these results and optimize induction therapy strategies for this high-risk patient population.

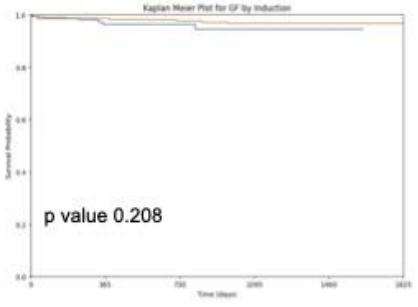
Figure.jpg

Figure 1.

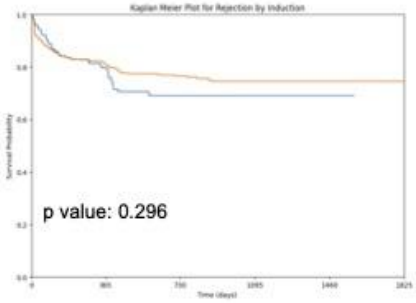
A. Patient overall survival



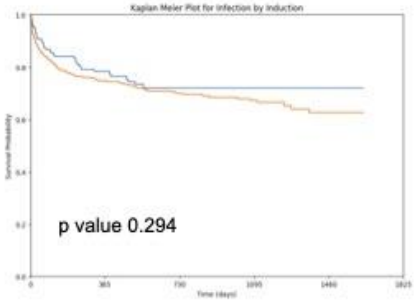
B. Death-censored graft survival



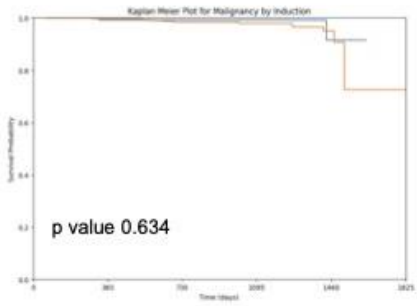
C. Rejection-free survival



D. Infection-free survival



E. Malignancy-free survival



Abstract Submission No.: OP-0224

Optimizing Prognostic Prediction in Kidney Allografts with Pre-Existing Diabetic Nephropathy: Combining DN RPS and Remuzzi Grading

Huanxi Zhang[1], Jiali Wang[2], Giorgia Comai[3], Longshan Liu[1], Gaetano La Manna[3], Huanxi Zhang[1], Wenfang Chen
[1]Department of Organ Transplant Center, First affiliated hospital of Sun Yet-sen University, China
[2]Department of Department of Nephrology, First affiliated hospital of Sun Yet-sen University, China
[3]Department of Department of Experimental, Diagnostic and Specialty Medicine Nephrology, Dialysis and Transplantation Unit, S. Orsola-Malpighi Hospital University of Bologna, Italy
[4]Department of Department of Pathology, First affiliated hospital of Sun Yet-sen University, China

Objectives : How to assess diabetic nephropathy (DN) in diabetic mellitus (DM) donor evaluation and to what extent they are acceptable are unclear.
Methods : A single-center study included DN (n = 13), standard donor (SD) (n = 802) and expanded criteria donor (ECD) (n = 124) donor kidneys. An international multicenter study included 70 DN donor kidneys. The pre-transplant donor kidney biopsy (PTDB) was graded based on DN renal pathology society (RPS) grade and Remuzzi grade. We evaluated and compared the predictive capacity of DN RPS grade and Remuzzi grade on DN allograft prognosis.
Results : The single-center study found DN recipients had significantly lower graft survival, lower eGFR and more severe proteinuria than those of SD and ECD. The international multicenter study found the majority of graft loss was due to chronic allograft dysfunction with severe proteinuria (12/17, 70.6%). Neither donor clinical profile nor Remuzzi G score correlated with DN severity. High DN grade donor kidneys (≥ IIb, n = 20) independently associated with poorer graft survival (HR = 5.68, p = 0.002), lower two-year eGFR (Coefficient = -22.43, p = 0.002) and post-transplant proteinuria (One-year: OR = 9.13, p = 0.011; Two-year: OR = 6.63, p = 0.030) in the multivariate regression model. Allograft with high DN grade demonstrated poorer allograft survival despite a low Remuzzi grade. Allografts with the same Remuzzi grade but high DN grade tended to have more severe one-year proteinuria.
Conclusions : PTDB can clarify the presence and severity of DN. Remuzzi grade alone is insufficient for DN donor kidney assessment. Combining DN RPS grade and Remuzzi grade was effective in predicting DN allograft prognosis. Donor kidney with low DN grade (

Abstract Submission No.: OP-0425

Comparative Analysis of Immunosuppressant Adjustments in BK Viremia Management: Sirolimus, Leflunomide, and MMF Tapering

Hye Eun Kwon, Jin-Myung Kim, Joo Hee Jung, Youngmin Ko, Shin Sung, Young Hoon Kim, Hyunwook Kwon
Department of Kidney and Pancreas Transplantation, Asan Medical Center, Korea, Republic of

Objectives : This study examined the clinical outcomes of BK viremia (BKV) infection according to different immunosuppressant strategies across three institutions: AMC, SNU, and SMC. The study cohort was divided into three groups based on the changes made to their immunosuppressive regimen following the detection of BKViremia: an MPA tapering or discontinuation group, a Sirolimus conversion group, and a Leflunomide conversion group. Patients were included in these groups if the respective medication change was made within six months of BKViremia detection and maintained for at least one year.
Methods : Out of a total of 1,650 patients, 1,311 (79.5%) were in the MPA group, while Sirolimus and Leflunomide were administered to 78 (4.7%) and 261 (15.8%) patients, respectively. Gender distribution, diabetes mellitus prevalence, and desensitization rates were similar among the groups. However, the use of tacrolimus was significantly higher in the Sirolimus group compared to the other groups ($P = 0.031$).
Results : BKV treatment failure, defined as a final log(BKViremia PCR) value > 3, was significantly higher in the Sirolimus group (15.4%) compared to the MPA and Leflunomide groups (7.6%, $P = 0.036$). In the multivariate analysis, the risk of acute rejection following BKViremia was significantly higher in patients treated with Sirolimus (HR: 2.70, 95% CI: 1.85–3.93, $P < 0.001$) and Leflunomide (HR: 1.76, 95% CI: 1.37–2.26, $P < 0.001$) compared to the MPA group.
Conclusions : In conclusion, the Sirolimus group showed poorer BKViremia remission rates compared to the MMF-adjusted and Leflunomide groups. Moreover, patients in the Sirolimus and Leflunomide groups exhibited a higher incidence of acute rejection when these drugs were maintained long-term, compared to the MMF-adjusted group. Therefore, when adjusting immunosuppressive therapy to manage BKViremia, it is crucial to balance the risk of rejection with the effectiveness of BKV control.

table.JPG

Table 1 Baseline and clinical characteristics of study patients

Demographics	MPA	Sirolimus	leflunomide	*P*-value
Number of patients	1311 (79.5)	78 (4.7)	261 (15.8)	
Female sex	498 (38.0)	28 (35.9)	105 (40.2)	0.72
Diabetes mellitus	323 (24.7)	13 (16.7)	68 (26.1)	0.23
Desensitization	308 (23.5)	17 (21.8)	56 (21.5)	0.75
Calcineurin inhibitor				0.031
Tacrolimus	1220 (93.1)	76 (97.4)	242 (92.7)	
Cyclosporin	91 (8.9)	2 (2.6)	19 (7.3)	
***BKV treatment failure**	99 (7.6)	12 (15.4)	18 (6.9)	0.036
Multivariate analysis for acute rejection after BKViremia				
		HR (95% CI)		
Desensitization		1.12 (0.94–1.48)		0.15
Age		0.99 (0.99–1.01)		0.86
Female vs. male		0.99 (0.81–1.23)		0.99
Diabetes mellitus		0.78 (0.60–1.01)		0.51
Tacrolimus vs. Cyclosporin		1.35 (0.97–1.88)		0.074
MPA group (reference)				<0.001
Sirolimus		2.70 (1.85–3.93)		<0.001
Leflunomide		1.76 (1.37–2.26)		<0.001

Continuous data are presented as means ± standard deviations, and categorical data are presented as number (%).

*BKV treatment failure = final log(BKViremia PCR) value > 3

Abstract Submission No.: PP-0008

Preoperative Versus Intraoperative Administration of Rabbit Antithymocyte Globulin in Kidney Transplant Patients: a Single-Center Retrospective Cohort Study

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Objectives : Rabbit antithymocyte globulin (rATG) is used as induction therapy in kidney transplantation and the administration of its first dose differs in clinical practice. In National Kidney and Transplant Institute (NKTI), it is either administered ~6 hours prior to surgery or intraoperatively. The purpose of this benchmarking study was to determine the association between the timing of administration of the first dose of rATG and the composite outcomes such as delayed graft function (DGF), biopsy-proven acute rejection (BPAR) and graft loss.
Methods : We included adult patients who received first kidney transplant from 2014-2018 (n= 571). Mann-Whitney U test, and Fisher's Exact/Chi-square test were used to determine the differences in mean, median and frequency between two groups, respectively.
Results : The cohort was divided into two: those who received rATG preoperatively (n= 398) and intraoperatively (n= 173). Most of the donors in the intraoperative group comprised of deceased organ donors (DOD) (44.51% vs. 7.79%, p <.001) and had longer median cold ischemia time (51minutes vs. 25minutes, p <.001). The overall occurrence of DGF (n= 51, 8.93%) was higher in the intraoperative group (19.08% vs. 4.52%, p <.001). In the subgroup analysis of recipients with living donors (n= 463), the intraoperative group (n= 96) had higher incidence of DGF (11.46% vs. 2.18%) than the preoperative group (n = 367). This difference was significant (p <0.001), highlighting the influence of the timing of rATG administration on DGF incidence. Among DOD recipients (n= 108), high rates of DGF were observed regardless of the timing of rATG administration: 32.26% in the preoperative (n= 31) and 28.57% in the intraoperative group (n= 77), p= 0.7056.
Conclusions : The intraoperative group had higher incidence of delayed graft function, notably observed among living donors. There was no significant difference in the occurrence of BPAR and graft loss at one-year post-transplant.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 10
(Kidney / Pancreas)

Abstract Submission No.: OP-0183

Bowel Complications Requiring Surgical Interventions in Kidney Transplant Recipients: A Study on Clinical Characteristics and Risk Factors

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Objectives : Bowel perforation is a rare but serious complication that can occur in kidney transplant recipients due to their weakened immune system and other factors associated with the transplant procedure. This study aimed to analyze the characteristics of patients who experienced bowel perforation after kidney transplantation and identify potential risk factors.
Methods : A retrospective analysis was conducted at a single center, involving 31 patients who underwent bowel resection surgery after kidney transplantation between 1990 and 2020. Descriptive statistics were employed to examine the baseline characteristics of patients and associated risk factors. Data were collected retrospectively from electronic medical records, including patient demographics, transplant clinical dataand surgical data.
Results : The study showed that kidney transplant recipients, though infrequently (<0.5%), could undergo bowel resection surgery due to diverse causes such as bowel perforation, ischemia, posttransplant lymphoproliferative disorder, and obstruction. Notably, bowel perforation accounted for 48.4% of all cases that derived from various causes, with bowel inflammation being the most prevalent, succeeded by fungal infection and Kayexalate ileitis. The study's average participant age was 53.6 ± 14.2 years with males comprising 54.8%. Characteristics included ABO incompatibility (25.8%), cardiac comorbidities (29.0%), diabetes mellitus (41.9%), and history of re-transplantation (19.4%). Bowel resection transpired an average of 54.3 months post-transplant, with a standard deviation of 77.2, underscoring the unpredictability of such complications. The analysis on donor factors revealed certain noteworthy features, such as past cytomegalovirus (CMV) infection indicated by CMV IgG in 51.6% of cases and past Epstein-Barr virus (EBV) infection indicated by EBV IgG in 32.3%.
Conclusions : This study provides analytic results on baseline characteristics and associated risk factors of renal transplant patients who underwent bowel resection after transplantation. The findings provide valuable insights for identifying high-risk patients and implementing strategies to prevent bowel perforations during post-transplant periods.

bowel.jpg

Table 1. Preliminary attributes of study participants undergoing bowel resection post kidney transplantation

Variables			
Bowel resection causes, n (%)			
Perforation			15 (48.4)
	Inflammation (ulcer, colitis, ileitis)		11
	Fungal infection		2
	Kayexalate ileitis		2
Obstruction			5 (16.1)
Ischemia			10 (32.3)
PTLD			1 (3.2)
Recipient characteristics			
Male, n (%)			17 (54.8)
Age, years			53.6 ± 14.2
Body mass index, kg/m^2			22.6 ± 6.1
Re-transplantation, n (%)			6 (19.4)
Time after transplantation, months (SD)			54.3 ± 77.2
Cadevar KT, n (%)			18 (58.1)
ASA score			2.8
Cardiac comorbidities, n (%)			9 (29.0)
ABOi incompaitiblity, n (%)			8 (25.8)
HLA incompatibility, n (%)			3 (9.7)
Preoperative dialysis duration, months (SD)			44.1 ± 46.7
Dibetes mellitus, n (%)			13 (41.9)
Peripheral vascular disease, n (%)			9 (29.0)
History of previous abdominal surgery, n (%)			12 (37.7)
Transplantation operation, n (%)			
	Warm ischemic time, minutes		6.5 ± 9.0
	Cold ischemic time, minutes		126 ± 129.2
Immunosuppression, n (%)			
	Induction regimen		
		Antithymocyte globulin	24(77.4)
		Basiliximab	7 (22.6)
	Calcineurin inhibitor		
		Tacrolimus	19 (61.3)
		Cyclosporine	12 (38.7)
Recent pulse (within 6 months), n (%)			12 (38.7)
CMV			23 (74.2)
BKNV			0 (0%)
Donor characteristics			
Male, n (%)			22 (71.0)
Age, years			45.1 ±22.0
Body mass index, kg/m^2			25.4 ±3.44
HTN, n (%)			5 (16.1)
CMVIgG, n (%)			16 (51.6)
EBVIgG, n (%)			10 (32.3)

*ASA, American Society of Anesthesiologists; CMV, cytomegalovirus; BKNV, poliomavirus BK virus; EBV, Epstein-Barr virus

Abstract Submission No.: OP-0245

Estimated glomerular filtration rate in kidney transplant recipients: Which equation performs better?

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Objectives : This study aimed to evaluate the performance of five established eGFR equations (MDRD, Asian modified CKD–EPI, CKD–EPI SCysC 2012, CKD–EPI SCr 2021, and CKD–EPI SCr–SCysC 2021) in the Vietnamese population.
Methods : This cross-sectional study involved 299 Vietnamese KTRs, with measured GFR (mGFR) determined using technetium-99m-diethylenetriaminepentaacetate (^{99m}Tc–DTPA) renal dynamic scintigraphy. The performances of the five eGFR equations were compared based on bias, P_{30} accuracy, absolute accuracy, precision, root mean square error (RMSE), concordance correlation coefficient (CCC), and Pearson's correlation coefficient (r), along with their 95% confidence intervals (CIs).
Results : Among the equations, CKD–EPI SCr–SCysC 2021 showed the best performance. The values for median bias, P_{30}accuracy, absolute accuracy, precision, RMSE, CCC, and r were: 2.57 [1.22; 3.55] mL/min/1.73 m^2, 87.6% [83.3; 90.6], 10.0% [8.3; 11.7], 11.29 [9.57; 13.40] mL/min/1.73 m^2, 11.54 [10.42; 12.92], 0.787 [0.737; 0.828], and 0.810 [0.759; 0.850], respectively. However, the MDRD equation did not show significantly lower precision and accuracy than the CKD–EPI SCr–SCysC 2021 equation. Additionally, all five equations demonstrated improved accuracy in the mGFR ≥ 60 mL/min/1.73 m^2 subgroup compared to the mGFR < 60 mL/min/1.73 m^2 subgroup.
Conclusions : Our findings suggest that the CKD–EPI SCr–SCysC 2021 equation is the most precise and accurate eGFR equation among those studied in Vietnamese KTRs. Further studies with larger cohorts are needed to validate these results.

Abstract Submission No.: OP-0318

Minimally Invasive Kidney Transplantation versus Conventional Kidney Transplantation: A Retrospective Propensity Score Matched Analysis

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Objectives : Minimally invasive techniques have been explored in KT recipients, for early recovery and less pain. The purpose of our study was to analyze the difference between minimal-incision kidney transplantation (MIKT), and conventional kidney transplantation (CKT).
Methods : LDKT recipients transplanted between February 2006 to June 2024 at Seoul St. Mary's Hospital were included in our study. 100 MIKT patients were compared with a 1:4 propensity-score matched CKT group, based on age, sex and BMI.
Results : The average age was 29.6±8.3 years in the MIKT group, and 46.1±11.5 years in the CKT group. Female sex was 88.0% in the MIKT group and 32.0 % in the CKT group, and average BMI were 19.6±2.9 kg/m^2 and 23.7±3.6 kg/m^2 respectively. Other than the number of plasmaphereses being lower in the MIKT group (1.1±2.0 vs. 1.7±2.7), immunologic characteristics and immunosuppression were similar between the two groups. Operation time was significantly shorter in the MIKT group compared with CKT group (256.2±56.9 vs. 279.8±59.4 minutes, $p<0.001$). There were no significant differences in delayed graft function, biopsy-proven acute rejection, graft failure and all-cause mortality between the two groups. Incidence of long-term complications (infection, malignancy, cardiovascular) did not show a significant difference between groups.
Conclusions : MIKT is a safe and feasible method with no statistical differences in transplant outcomes and complications. MIKT can be a suitable option for appropriate patients, with favorable cosmetic results.

Figure 1.JPG

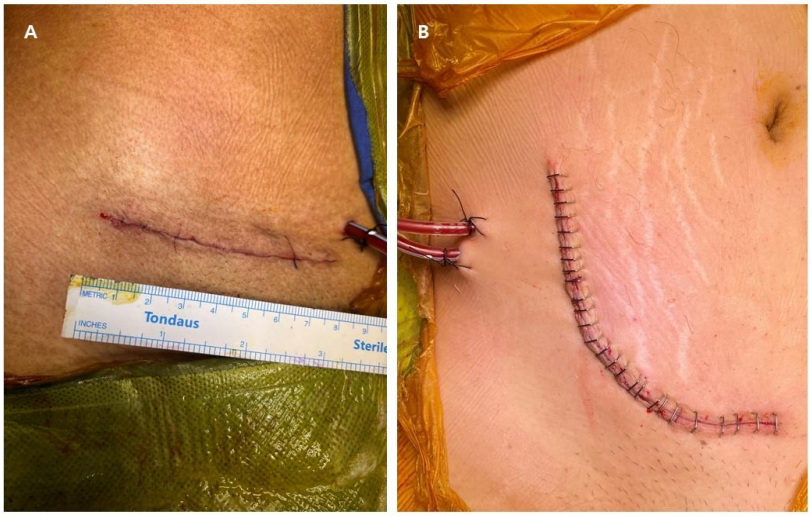

Figure 1. Minimally invasive kidney transplantation incision (A) and conventional kidney transplantation incision (B)

Abstract Submission No.: OP-0297

Desensitization and Kidney Transplant Outcomes in the Elderly: a retrospective multi-center study

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Objectives : Elderly populations face significant challenges in kidney transplantation due to comorbid conditions and limitations in the donor pool. Desensitization is a strategy used to address these limitations, but its impact on KT outcomes in elderly populations remains poorly understood. This study aims to compare the clinical outcomes of KT recipients aged 60 and older who underwent desensitization with those who received a transplant without desensitization.
Methods : This retrospective, multi-center cohort study included 1,079 patients aged 60 and older who underwent their first solitary living donor KT between January 2005 and December 2020. Patients were divided into two groups based on whether they received desensitization prior to KT. To address baseline differences, propensity score matching was performed, resulting in two matched cohorts of 374 patients each. Outcomes such as mortality, graft failure, biopsy-proven acute rejection (BPAR), infections requiring hospitalization, and newly diagnosed malignancies were compared between the two groups.
Results : Kaplan-Meier estimates of patient survival at 1, 3, and 5 years were 96.5%, 92.6%, and 90.1% in the desensitization group, respectively, compared to 98.9%, 96.6%, and 93.9% in the non-desensitization group (p=0.00078). Death-censored graft survival and BPAR-free survival were also significantly lower in the desensitization group (p=0.00073 and 0.0016, respectively). No significant differences were observed between the two groups for Infection-free and malignancy-free survival.
Conclusions : This study found no significant differences in infection-free and malignancy-free survival between KT recipients who underwent desensitization and those who did not. Desensitization appears to be a safe option for elderly patients undergoing KT. However, patient survival, graft survival, and BPAR-free survival were significantly lower in the desensitization group compared to the non-desensitization group. Further research is needed to compare desensitized patients with those on the waitlist to better understand the impact of desensitization on transplant efficacy.

Abstract Submission No.: OP-0077

Older Donors and Multiple Donor Arteries are Risk Factors of Ureteral Stenosis after Kidney Transplantation: A Meta-Analysis

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Objectives : Ureteral stenosis in a transplanted kidney can negatively affect the function of the graft and lead to serious medical issues for the recipient. Treating them can be difficult and may necessitate extensive surgical intervention. Therefore, the aim of this study was to investigate the risk factors associated with the occurrence of ureteral stenosis following kidney transplantation.
Methods : A meta-analysis of research published prior to August 2024 was performed by utilising the PubMed, Science Direct, Cochrane, and Directory of Open Access Journal (DOAJ) databases. The evaluation included studies that assessed the presence of ureteral stenosis after kidney transplantation and investigated its risk factors. This study analysed potential risk factors by calculating pooled mean differences (MD) or odds ratios (OR) along with 95% confidence intervals (CIs). The I2 value was used to assess the heterogeneity of the studies. The meta-analysis was conducted using Review Manager 5.4.
Results : From six included studies, 204 cases of ureteral stenosis were reported among 4419 kidney transplants (4.62%). The potential risk factors were investigated across donor, recipient, intraoperative, and postoperative variables. The identified risk factors included older donors (MD, 5.61 [95% CI, 3.51-7.72], $P < 0.00001$, $I^2 = 55\%$) and multiple arteries of kidney donor (OR, 3.86 [95% CI, 1.40-10.67], $P = 0.009$, $I^2 = 64\%$).
Conclusions : Advanced donor age and the presence of multiple donor arteries are potential risk factors for developing ureteral stenosis after kidney transplantation. Mitigating these factors may improve the long-term outcomes for transplant recipients.

Abstract Submission No.: OP-0140

Comparative Analysis of Cancer Incidence and Treatment Rates in Kidney Transplant Recipients and End-Stage Kidney Disease Patients: A Nationwide Matched Cohort Study

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Objectives : This study aims to evaluate cancer risk and treatment rates in kidney transplant recipients (KTRs) and end-stage kidney disease (ESKD) patients compared to the general population.
Methods : Using the Korean nationwide Health Insurance Review and Assessment Service database from 2002 to 2022, we conducted a 1:1:1 exact matching across the general population, KTRs, and ESKD patients, matched by sex, age, index date, hypertension, diabetes, and dialysis duration. Patients who were diagnosed with cancer within 3 years before transplantation/dialysis or within 180 days post-transplantation/dialysis were excluded. Incidence rate ratios (IRRs) and mortality rate ratios (MRRs) for all cancers and specific cancer types were calculated based on ICD-10 codes.
Results : Compared to the general population, the all-cancer IRR was 1.61 (95% CI 1.47–1.76) for KTRs and 2.12 (95% CI 1.94–2.31) for ESKD patients. The highest IRRs in KTRs were observed for kidney cancer (21.87, 95% CI 10.35–55.36), non-Hodgkin lymphoma (7.3, 95% CI 4.15–13.84), and bone, skin, and soft tissue cancers (6.73, 95% CI 4.07–11.75). ESKD patients exhibited higher IRRs than KTRs, with the all-cancer IRR at 2.12 (95% CI 1.94–2.31), and kidney cancer at 50.8 (95% CI 24.31–127.59). The all-cancer MRR was higher in ESKD patients than KTRs (2.87 (95% CI 2.45–3.37) vs. 1.55 (95% CI 1.31–1.84). Both KTRs and ESKD groups showed lower chemotherapy and radiation therapy rates compared to the general population, with ESKD having the lowest rates (chemotherapy: 33% vs. 31.6% vs. 24.98%; radiation therapy: 25.27% vs. 18.71% vs. 16.88% for the general population, KTR, and ESKD, respectively; $p<0.001$ for both).
Conclusions : This study demonstrates significantly higher cancer incidence and mortality rates in both KTRs and ESKD patients compared to the general population, with ESKD patients showing a higher risk and lower treatment rates than KTRs. These findings underscore the need for tailored cancer screening and management strategies for these high-risk populations.

Asian Transplantation Week 2024
Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 11
(Pathology / Basic)

Abstract Submission No.: PP-0368

Characterization of Innate Immune Cell Subtypes in Kidney Transplant Recipients with BK Virus Infection through Single-Cell Transcriptomic Profiling of Peripheral Blood

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Objectives : BK virus-associated nephropathy (BKVAN) is a major complication following kidney transplantation. This study aimed to characterize the immune cell subtypes and their gene expression profiles in kidney transplant recipients with BK virus infection using single-cell RNA sequencing (scRNA-seq) of peripheral blood mononuclear cells (PBMCs).
Methods : PBMCs from six kidney transplant recipients (one stable, two with BK viremia, and three with BKVAN) were analyzed using scRNA-seq. Cells were multiplexed using Cell Multiplexing Oligos and sequenced on the HiSeqXten platform. Data processing was performed using Cell Ranger v6.0.2, followed by integration and analysis with the Seurat package in R. Batch effects were mitigated using SCTransform and RPCA-based integration. Cell clusters were identified using UMAP and manual annotation based on known cell markers and highly variable genes.
Results : Seventeen distinct immune cell types were identified across 31,779 cells. CD8+ Cytotoxic T Cells and CD14+ Classical Monocytes showed significant variations among groups. CD8+ T cells were higher in stable (26.8%) and BKVAN (19.9%) groups compared to BK viremia (7.8%). Monocytes were elevated in BK viremia (38.5%) and BKVAN (21.5%) compared to stable (7.1%). Activated Effector Cells, absent in healthy individuals, showed high gene expression in BKVAN. Key markers like GZMH, IFNG, and CD8A were upregulated in CD8+ T cells, while PROC, CST6, and CCR2 were prominent in monocytes during BK virus infection.
Conclusions : This study provides novel insights into the immune cell landscape and gene expression profiles in kidney transplant recipients with BK virus infection. The findings highlight potential targets for future therapeutic interventions and monitoring strategies, paving the way for personalized immunotherapies and improved management of BKVAN in kidney transplant recipients.

Abstract Submission No.: OP-0341

Protective effect of Protopanaxadiol against tacrolimus-induced apoptosis in renal proximal tubular HK-2 cells

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Objectives : FK506 is an immunosuppressant agent that is frequently used to preven rejection of solid organs upon transplant. However, nephrotoxicity due to apoptosis and inflammatory response mediated by FK506. Protopanaxadiol (PPD), as an active triterpenoid natively present in Panax ginseng, is the precursor of high-value ginsenosides. The aim of the present study was to evaluate the potential protective effects of PPD isolated from Panax ginseng against tacrolimus (FK506)-induced apoptosis in renal proximal tubular HK-2 cells.
Methods : HK-2 cells were treated with FK506 and PPD, and cell viability was measured. Protein and gene expressions of SIRT1, mitogen-activated protein kinases, caspase-3, IL-6, TNF-alpha and kidney injury molecule-1 (KIM-1) were evaluated by RT-PCR and Western blotting analyses. The number of apoptotic cells was measured using an image-based cytometric assay.
Results : Reduction in cell viability by 60mM FK506 was ameliorated significantly by cotreatment with PPD. The phosphorylation of p38, AKT, and KIM-1, IL-6, TNF-alpha and cleavage of caspase-3, increased markedly in HK-2 cells treated with FK506 and significantly decreased after cotreatment with PPD. The number of apoptotic cells decreased after cotreatment with PPD (5mM).
Conclusions : The protective effects of PPD on FK506-induced apoptosis and inflammation were mediated by the inhibition of mitogen-activated protein kinases and caspase activation.

Abstract Submission No.: PP-0157

Serostatus-Based Analysis of VZV and CMV-Specific Immunity in Kidney Transplant Recipients: ELISPOT Results at Pre- and Post-Transplant 1 and 3 months

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Objectives : Reactivation of VZV and CMV in kidney transplant recipients (KTRs) can cause severe clinical complications. Numerous studies emphasize the critical role of virus-specific cell-mediated immunity (CMI) in preventing these reactivations. We evaluated VZV- and CMV-specific CMI in both donors and recipients, based on serostatus, before and after transplantation.
Methods : This study included 12 CMV-seropositive KTRs, of whom 7 were VZV-seropositive and 5 were VZV-seronegative. Twelve matched donors, seropositive for both CMV and VZV were also included. VZV- and CMV-specific CMI in KTRs were tested at 0 (pre-transplant), 1, and 3 months after kidney transplantation (KT) using IFN-γ ELISPOT assays against viral antigens: glycoprotein E (gE) and immediate-early protein 63 (IE63) for VZV, and pp65 for CMV. Spot-forming cells (SFCs) per 1,000,000 PBMCs were quantified.
Results : Pre-transplant VZV-ELISPOT results showed wide variability among KTRs [gE: median (range), 25.0 (6.0 – 84.0), IE63: 17.0 (2.0 – 62.0)] and donors [gE: 44.0 (10.0 – 76.0), IE63: 21.0 (8.0 – 68.0)] with VZV-specific CMI generally lower than CMV-specific CMI. [VZV: 17.0 (0 – 98.0) vs. CMV: 813.0 (0 – 4000)] ($P<0.0001$). VZV-seropositive KTRs tend to have higher VZV-ELISPOT results than VZV-seronegative KTRs [gE: 30.0 (6.0 – 84.0) vs. 16.0 (6.0 – 46.0); IE63: 18.0 (4.0 – 62.0) vs 10.0 (2.0 – 28.0)]. At 1-month post-transplant, all KTRs exhibited significantly reduced VZV- and CMV-ELISPOT results compared to pre-transplant levels. Partial recovery of CMI was observed at 3-months post-transplant, with VZV-seropositive KTRs showing more substantial recovery in VZV-specific CMI than seronegative KTRs. Specifically, gE and IE63 responses increased by 2.5-fold and 1.16-fold in seropositive KTRs, compared to 0.6-fold and 1.5-fold in seronegative KTRs, respectively.
Conclusions : Personalized monitoring VZV and CMV-CMI using ELISPOT assays, based on serostatus, may be a useful clinical tool for assessing the risk of viral reactivation in KTRs.

Abstract Submission No.: PP-0312

Eplet Analysis to Determine Immunogenicity of HLA-Class I Eplets: A Study Based on Sensitization During Pregnancy

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Objectives : Human leukocyte antigen (HLA) is a major antigen involved in organ transplantation, and antibodies against the donor's HLA (DSA) can cause rejection and loss of graft function. Recently, attention has been focused on eplets, which are the binding sites of DSA. It is known that each eplet has different immunogenicity, and to perform appropriate immunological evaluation using eplet mismatches, it is necessary to consider the immunogenicity of each eplet. The study aimed to identify potentially immunogenic HLA-Class I eplets in pregnancy using eplet analysis.
Methods : The subjects included 25 patients who visited our department between March 2010 and October 2022, intending to receive living-donor kidney transplants from their husbands. These patients had no prior history of transplantation or blood transfusion and had experienced pregnancy only with their husbands. HLA typing (A, B) was performed for both the patients and their husbands, and antibody-verified eplets (Abv-Eplets) with mismatches were identified. Additionally, anti-HLA antibody screening was conducted on the patients. If positive, Labscreen Single Antigen testing was performed. Based on these data, eplet analysis was performed to extract potentially immunogenic Abv-Eplets, and the antibody positivity rate for each Abv-Eplet (calculated as the number of antibody-producing cases/number of mismatched cases × 100%) was determined.
Results : When the positive cutoff for eplet analysis was set at nMFI >100, the Abv-Eplets with the highest antibody positivity rates were 82LR (37.5%), 62EE (33.3%), 65GK (33.3%), 80I (28.6%), and 163LS/G (28.6%).
Conclusions : Since these Abv-Eplets could also be potential immunogens involved in antibody production post-kidney transplantation, attention should be paid to the appearance of antibodies against these eplets in post-transplant patients.

Figure1.jpg

Table 1 Antibody positivity rates of eplets

Eplet	Polymorphic residues	Ab (+)	Mismatch	Antibody Positivity Rates
82LR	82L83R	3	8	0.375
62EE	62E63E	2	6	0.333
65GK	65G66K	2	6	0.333
80I	80I	2	7	0.286
163LS/G	163L-167G/S	2	7	0.286
80TLR	80T82L83R	2	8	0.25
44RT	44R45T	1	6	0.167
166DG	166DG	1	6	0.167

Abstract Submission No.: OP-0184

Exploring a Novel Non-Invasive NK-Cellular Humoral Activation Test (NK-CHAT) for Detecting Humoral Rejection in Kidney Transplantation: A Stratified Approach Based on Preformed DSAs

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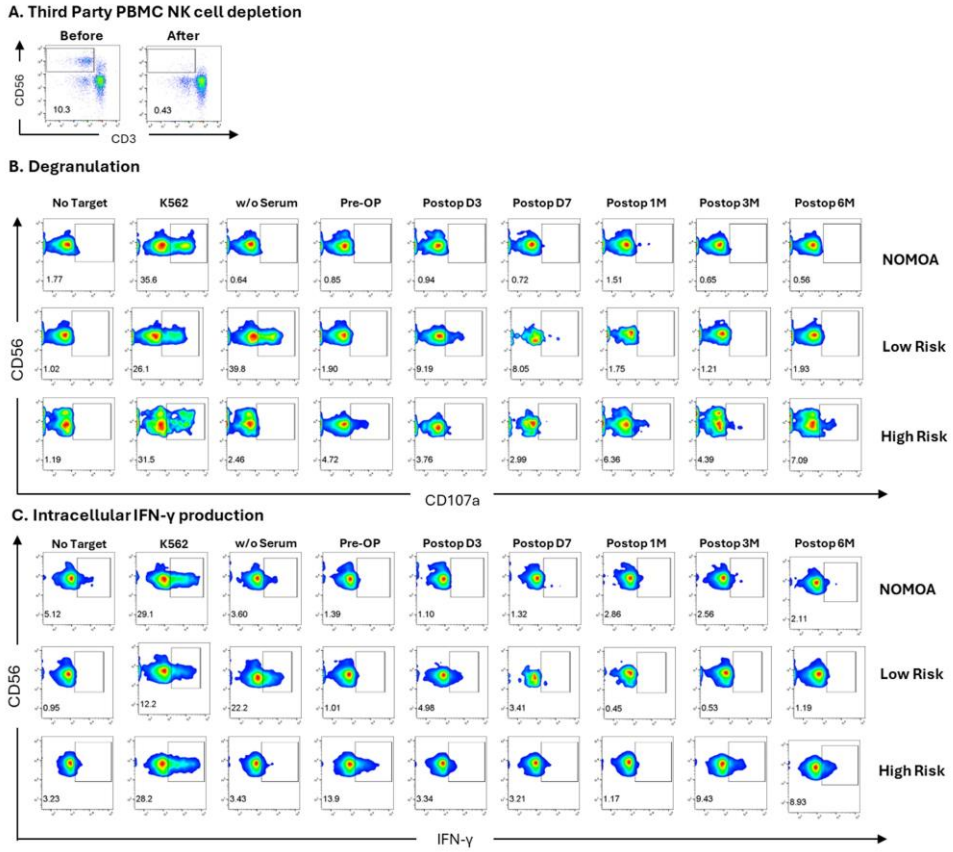
Objectives : Kidney transplantation improves survival and quality of life for end-stage renal disease patients but is threatened by antibody-mediated rejection (AMR). Natural killer (NK) cells play a key role in AMR. The NK-CHAT (NK-Cellular Humoral Activation Test) assay is a novel, non-invasive method to measure NK cell activation and detect AMR. This study is the first to assess the NK-CHAT assay's effectiveness in identifying humoral rejection in kidney transplant patients.
Methods : Participants were grouped by donor-specific antibody (DSA) levels: control (no DSA), low-risk, and high-risk. Peripheral blood mononuclear cells (PBMCs) from post-transplant samples were tested with the NK-CHAT assay. NK cell activation was assessed via flow cytometry, measuring CD107a expression and IFN-gamma production. The assay's performance in detecting biopsy-proven AMR was evaluated using sensitivity, specificity, positive predictive value, and negative predictive value.
Results : Successful NK cell depletion in third-party PBMCs was confirmed by reducing the CD56+CD3− NK cell population from 10.3% to 0.43%. The NK-CHAT assay revealed variability in NK cell activation across different DSA levels. Increased NK cell degranulation, indicated by CD107a expression, and higher IFN-gamma production were observed in high-risk patients. These findings suggest that higher preformed DSA levels correlate with increased NK cell-mediated cytokine production. A moderate yet significant positive correlation between NK-CHAT results and preformed DSA levels ($r = +0.42$, $p < 0.001$) further indicated that elevated DSA levels are associated with greater NK cell activation.
Conclusions : The results of this study have significant implications for the clinical management of kidney transplant recipients. The NK-CHAT assay's ability to distinguish NK cell activity between ABMR and control groups, as well as its capacity to differentiate between low- and high-risk patients based on the presence of DSAs, suggests that this assay could be a valuable addition to routine post-transplant monitoring protocols.

NKcell.jpg

Figure 1. Flow Cytometric Analysis of NK Cell Activation in Kidney Transplant Recipients



Asian Transplantation Week 2024

Nov. 14(Thu)~16(Sat), 2024 Conrad Seoul, Korea

Mini-oral Presentation

Mini-oral Presentation 12
(Coordinator)

Korean

Challenges and Opportunities in Asian Transplantation

Abstract Submission No.: OP-0264

단일센터에서의 생체 응급 간이식 승인 현황 분석

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Objectives : 간이식은 말기 간경변 및 급성 간부전 환자에게 생명을 구하는 유일한 치료 방법이다. 본 연구 목적은 최근 5 년 단일센터에서의 생체 응급 간이식 선정 승인 현황을 파악하여 생체 응급 간이식을 준비하는 환자들과 의료진에게 자료를 제공하고자 함이다.
Methods : 본원에서 2019 년부터 2023 년까지 5 년간 KONOS 로 생체 응급 승인을 요청한 173 건을 대상으로 의무기록을 통한 승인 대기 기간 및 대기자 특성을 후향적으로 검토, 분석하였다.
Results : 2019 년부터 2023 년까지 본원 생체 응급 승인 요청 건수는 총 173 건으로 2019(60 건), 2020(30 건), 2021(40 건), 2022(31 건), 2023(12 건)으로 확인되었다. 연도별 평균 승인 대기 기간은 2019(1.41 일), 2020(1.37 일), 2021(2.64 일), 2022(2.17 일), 2023(0.17 일)으로 평균 생체 응급 승인 대기 기간은 1.71 일(0~12 일)로 확인되었다. 이 중 121 건(69.9%)이 생체 응급 간이식, 32 건(18.5%)은 대기 중 뇌사 간이식, 5 건(2.89%)은 대기 중 사망, 5 건(2.89%)은 간이식 없이 회복, 나머지 10 건(5.78%)은 승인 취소, 철회되었으며 실제 간이식까지 진행된 건의 승인부터 간이식까지 평균 대기 기간은 3.03 일로 확인되었다. 생체 응급 승인 대기자의 주요 원인 질환은 알코올성 간경변 45 명(29.8%), 급성 간부전 41 명(27.1%), B 형간염 간경변 28 명(18.5%)이었으며 나머지는 기타 진단명이었다. 생체 응급 승인 대기자의 MELD 점수는 응급도 1 16 명(11.7%), 응급도 2 32 명(23.5%), 응급도 3 30 명(22%), 응급도 4 43 명(31.6%), 응급도 5 15 명(11%)으로 평균 MELD 점수는 30.85 점이었다. 생체 응급 승인 대기자와 기증자의 관계는 직계 존·비속이 120 명(69.4%), 형제·자매가 24 명(13.8%), 4 촌 이내 친척이 20 명(11.5%), 배우자 9 명(5.2%)으로 확인되었다.
Conclusions : 연도별 생체 응급 승인 요청 건이 감소하였고, 승인 대기 기간도 감소하였다. 생체 응급 승인 대기자의 주요 진단은 알코올성 간경변, 급성 간부전, B 형간염 간경변 순으로 확인되었으며 대기자의 평균 MELD 점수는 30.85 로 응급도가 높았다. 대기자와 기증자의 관계는 70%가 직계 존·비속에서 생체 응급 승인이 이루어졌다. 간이식 코디네이터는 생체 응급 간이식 승인 절차에 따라 간이식이 잘 진행될 수 있도록 관리하고 간이식을 준비하는 환자와 가족 및 해당 의료진들에게 적절한 정보를 제공하여 적절한 시기에 간이식을 준비할 수 있도록 조정하는 것이 매우 중요하다. 또한 2023 년 08 월 개정된 간장 응급 승인 절차 시행 이후 진행된 생체 응급 승인 환자를 대상으로 한 비교 조사가 필요할 것으로 사료된다.

Abstract Submission No.: NP-0307

심장이식 수혜자의 적응경험

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Objectives : 심장이식은 말기 심부전 환자에게 보편적으로 선택되는 치료방법이다. 그러나 심장이식의 건수가 점점 증가하고 있음에도 심장이식 수혜자의 삶의 경험이나 삶의 질에 대한 연구는 활발히 이루어지지 않고 있다. 심장이식 수혜자들은 수술 전후 다양한 어려움을 경험하는 한편 변화된 삶을 적응해야한다. 심장이식 수혜자들의 적응경험을 이해하는 것은 평생 관리해야하는 질환인 심부전환자에게 전인적으로 간호를 제공하는데 있어서 도움을 줄 것이다.
Methods : 본 연구는 개인 심층면담을 통하여 자료를 수집하였다. 참여자는 단일 센터에서 심장이식 수술 후 외래에서 추후관리를 받고 있는 수혜자를 대상으로 하였다. 2024 년 8 월 12 일부터 8 월 23 일까지 이식수술을 받은 후 5 년 이상 지난 수혜자에게 연구의 목적을 설명한 후 면담을 허락한 총 8 명의 수혜자를 심층 면담하였다. 연구의 자료분석은 Colaizzi(1978)의 6 단계를 이용하였다. 본 연구에서는 1 차적으로 개인면담 자료를 분석한 후 추후 면담을 이용하여 분석된 내용의 타당성을 확인하였다.
Results : 심장이식 수혜자들의 진술을 토대로 적응경험을 분류하면 다음과 같다. 심장이식 수혜자들은 수술 직후 변화된 자신의 상태와 바뀐 생활 양식에 적응하는데 불안함을 경험한다. 또한 신체적 기능이 떨어진 점, 직업을 바꿔야 하는 상황, 경제적 부담 등으로 인해 우울감을 느낀다. 그리고 일상 생활 중 몸이 아프게 되면 불안감이 증가한다. 한편으로는 수술 후 부작용이 사라지고 몸 상태가 회복되면서 심리적 만족감을 느낀다. 또한 퇴원 전 교육을 통해 약물 복용, 식단, 운동 등 필요한 정보를 얻을 수 있는 점, 수술 후에도 장기이식 코디네이터로부터 필요한 정보와 정서적 지지를 제공받을 수 있는 점에 만족함을 느낀다. 자조모임, 종교활동, 동호회 활동도 수술 후 적응에 도움이 됐다.
Conclusions : 심장이식 수혜자들은 말기 심부전 상태 중 심장이식을 선택할 수 밖에 없는 상황에서 수술을 받게 된다. 수술 후 변화된 상태와 생활 양식에 적응하고 회복하는 과정 중에 불안, 우울감을 경험한다. 일상에서도 직장 복귀나 경제적 부담으로 인해 삶의 만족감이 저하되기도 한다. 따라서 수혜자들이 수술 후 적응하고 있는 시기에 적절한 정보 제공과 정서적 지지가 수혜자들의 적응을 빠르게 돕는다고 사료된다. 또한 수혜자 입장에서 장기이식 코디네이터의 존재는 이식수술 전후로 심리적인 안정감을 준다고 여겨진다. 먼저 수술을 경험한 사람들의 조언을 들을 수 있는 자조모임 혹은 종교활동과 같은 사회적 활동도 이식 후 적응을 돕기 때문에 장기적으로 잘 유지되어야 한다고 생각한다.

Abstract Submission No.: PP-0288

기증활성화프로그램(DIP) 운영 개선을 통한 효과

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Objectives : DIP(Donation Improvement Program; 기증활성화프로그램)란 장기구득기관과 의료기관 간 협약을 통하여 병원별 전략을 수립하고 뇌사추정자 발굴과 기증 활성화 방안을 도모하는 프로그램으로 2012 년부터 운영하고 있다. 하지만 장기적 운영의 다양한 한계가 문제점으로 나타나며 운영 방식 개선 필요성이 제기되었고, 2021 년 DIPC(Donation Improvement Program Committee) 운영 방식을 개선하였다. 이에, DIP 운영 방식 개선 전후를 비교하여 앞으로의 나가가야 할 발전 방향을 제시하고자 한다.
Methods : DIP 협약이 장기적으로 지속되면서 DIPC(Donation Improvement Program Committee)시 뇌사추정자 발생이 많은 진료과 위원들의 참석율이 낮아 적극적으로 기증활성화 방안을 논의하기에 한계가 있었다. 이에, 2021 년부터 DIPC 운영 방식을 목적에 따라 참석 위원들을 특성화하여 ① 뇌사추정자 발생과 의료진 5 인~7 인으로 구성한 기증활성화를 위한 원내 정책을 결정하는 정책 회의 ② 원내 정책을 공유하고 실행을 위한 실무 중심의 다수 의료진으로 구성된 협조체계 구축회의로 구분하여 질적 향상을 위해 운영을 개선하였다. 2020 년부터 2023 년까지 DIPC 운영 개선 전후의 안건이행률과 DIP 협약병원의 뇌사추정자 통보 및 장기기증을 비교 분석하였다.
Results : DIP 협약병원은 2020 년 76 개 병원에서 2023 년 84 개로 확대 운영하고 있으며, DIPC 를 통해 참석 위원들과 장기기증 활성화를 위한 정책을 결정하는 회의 안건에 대한 이행률은 2020 년 54.4%에서 2023 년 77.1%로 증가하였고, 이에 따른 기증활성화를 위한 활동이 증가하였다. 또한 DIP 협약병원의 뇌사추정자 통보는 2020 년 1,833 건에서 2023 년 2,426 건으로 32.3%, 장기기증 또한 2020 년 334 건에서 2023 년 381 건 14.0%로 증가되었다.
Conclusions : DIPC 운영 방식 개선을 통해 협약병원의 회의 때 제안된 안건의 이행률과 그에 따른 뇌사장기기증 활성화 활동이 증가하였고, 더불어 뇌사추정자 통보건과 장기기증 건도 증가하였다. 또한 2022 년 의료질 평가의 '뇌사추정자 신고 수' 제도 도입으로 인하여 2023 년 뇌사추정자 통보 건이 크게 증가한 것으로 비추어 보았을 때 DIP 관련 제도적인 기반이 마련된다면 국내 기증활성화에 큰 도움이 될 것이다.

Abstract Submission No.: PP-0118

Toluene methylbenzene 중독에 의한 뇌사 장기기증 첫 증례 보고

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Objectives : Toluene methylbenzene 은 휘발성 유기용제로 산업 및 가정용으로 널리 사용되는 화학물질이다. 이는 고농도 노출 시 중추신경계 손상과 심각한 뇌 손상을 초래할 수 있다. 그러나 Toluene methylbenzene 중독으로 인한 뇌사 후 장기기증 사례는 매우 드물며, 이에 대한 문헌 보고는 부족한 실정이다. 이에 본 보고에서 Toluene methylbenzene 중독으로 인한 뇌사 환자의 첫 장기기증 사례를 공유하고자 한다.
Methods : 기증자는 우울증 과거력이 있는 53 세 남자로 2024 년 6 월 20 일 자택에서 페인트 시너(Toluene methylbenzene)을 음독하고 보호자의 신고로 응급실로 내원하였다. 내원 당시 환자는 의식이 있었으나 2 일 뒤, 급성호흡기능상실과 심한 산혈증이 동반되며 의식불명 상태가 되었다.
Results : (진단 및 경과) 응급실에서 시행한 혈액검사와 영상 검사에서 중독이 확인되었으며, 환자는 초기 집중 치료에도 불구하고 내원 2 일 뒤부터 뇌부종과 함께 심한 산혈증, 신경학적 손상이 관찰되며, 내원 6 일째 6 월 26 일 뇌사 판정을 받았다. (장기기증 과정) 뇌사 판정 이후 장기 적출 수술을 시행하여 심장, 간장, 신장 1 의 기증 및 수혜자에게 각각 이식이 시행되었다. 이식 후 초기 경과는 모두 양호하였으며, 수혜자들은 이식 한 달 후 추적 검사상 장기기능 검사 결과 모두 양호하였다.
Conclusions : Toluene methybenzene 중독으로 인한 뇌사 및 장기기증의 이 첫 사례는 Toluene methylbenzene 중독의 심각성을 환기시킨다. 또한, 뇌사 후 장기기증은 이식 대기자들에게는 새 생명을 중요한 기회를 제공함을 함께 보여준다. 본 증례는 향후 Toluene methybenzene 중독 환자의 관리 및 장기기증 절차에 대한 중요한 참고 자료로 활용될 수 있을 것으로 생각한다.

Abstract Submission No.: OP-0106

B 형 간염 바이러스 표면 항원 양성인 기증자로부터 심장이식 받은 수혜자 현황 분석

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Objectives : 심장이식은 말기 심부전 환자에게 생명을 구하는 방법일 뿐 아니라, 삶의 질을 증진시키는 치료방법이다. 뇌사기증자 부족으로 이식 대기중 사망가능성이 높으므로 심장이식이 적기에 이루어질 수 있도록 B 형 간염 바이러스 표면 항원(이하 HBsAg) 양성인 뇌사 기증자 심장을 수혜 적합한 장기로 고려하는 근거가 있다. 이에 본원에서 시행된 HBsAg 양성 기증자로 심장이식 받은 수혜자 현황을 확인해 보고자 한다.
Methods : 본원에서 시행된 심장이식 수혜자의 일반적 특성 및 이식당시 응급도 및 대기기간, 이식 후 생존 및 B 형 간염 바이러스 이환 유무 등을 KONOS 질병보건통합관리시스템과 의무기록 자료를 통하여 후향적으로 조사하였다.
Results : HBsAg 양성 기증자로부터 심장이식은 2002 년 처음 1 건을 시작으로, 2024 년 6 월말까지 총 17 건이 진행되었다. 성별은 남자 13 명, 여자 4 명이었고, 혈액형은 B 형 7 명, A 형 6 명, O 형 3 명, AB 형 1 명이었다. 이식 받을 당시 평균 연령은 남자 48 세(16 ~ 67 세), 여자 42 세(16 ~ 58 세)로 20 대 이하 5 건, 30 대와 40 대가 각각 1 건, 50 대 3 건, 60 대가 7 건이었다. 이식 당시 심장 응급도(Status, S)는 S0(6 명), S1(6 명), S2(3 명), S3(2 명)이었고, 이식 당시 상향된 최종 응급도의 평균 대기기간은 S0(9 일), S1(255 일), S2(37 일),S3(147 일)이었다. 17 건 중 3 건을 제외한 14 건에서 Hepatitis B immunoglobulin 이 투여되었고, 투여시기는 이식 당일(또는 익일), 이후 일주일 이내 추가 투여한 경우가 12 건 이었다. 수혜자의 이식 전 HBsAg 은 모두 음성이었고, HBsAb 는 4 명을 제외하고 양성이었다. 사망 4 건을 제외한 13 건의 경우 이식 후 정상 간 및 심장 기능을 유지하며 HBsAg 은 이식 초기부터 최근 경과까지 모두 음성으로 확인되었다.
Conclusions : 성공적인 이식을 위해서는 면역거부반응을 피하기 위해 지속적인 면억억제가 필요한데, 기증자의 바이러스 감염은 심장이식 과정에서 수혜자에게 전염될 수 있으므로, 이를 최소화 하기 위해서는 예방적 약제의 투약과 철저한 검사 등을 통해 면밀히 관찰해야할 필요가 있다. 심장이식 코디네이터는 HBsAg 양성 기증자로부터 심장이식을 받은 수혜자의 감염 예방 및 꾸준한 건강 관리 필요성을 교육하는 것이 중요하며 뇌사기증자 발생이 부족한 국내 현실에서 HBsAg 양성 기증자로부터의 심장이식 수혜 기회 확대 및 이식 후 안전성을 이식을 준비하는 이식 환자와 가족 및 관련 의료진에게 정보를 제공할 수 있다.

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간이식 코디네이터 교육 요구도 조사

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Objectives : 국내 장기이식은 1969 년 생체 신장이식 성공 이후 급속도로 발전하여 한국의 간이식은 세계적인 수준으로 도달하였다. 1999 년 '장기등이식에 관한 법률'에 의해 "이식의료기관은 장기 등의 적출, 이식을 위한 상담 연락 업무 등을 담당하는 간호사를 두어야 한다"고 명시하고 있다. 간이식 수술 현장에서 간이식 코디네이터는 이식을 위한 전반적인 관리, 교육, 연구 등의 주요한 업무를 맡고 있다. 특히 장기이식 코디네이터는 복잡한 장기이식과정 중 전반적인 이식과정을 조정해야 하기에 원활한 의사소통으로 의료진과의 협동해야 한다. 2022 년 1452 건의 간이식이 시행되었으며 이는 국립장기조직혈액관리원이 설립된 2000 년에 진행된 228 건에 비해 약 6.3 배 증가한 수치이며 간이식을 시행하는 의료기관 또한 2000 년 13 기관에서 2022 년 65 개 기관으로 급속하게 증가하였다. 간이식을 시작하는 코디네이터를 위한 교육은 현재 각 의료기관에서 자체적으로 이루어지고 있으며, 체계적이고 조직적인 교육은 이루어지고 있지 않은 실정이다. 따라서 간이식 코디네이터를 위한 전문교육과정 개발을 위해 간이식 코디네이터를 위한 교육 필요성과 참석 의향, 교육요구도 조사를 위해 본 연구를 시행하였다.
Methods : 본 연구는 14 개 병원의 간이식코디네이터 16 명을 대상으로 간이식 코디네이터를 위한 교육과정 개발을 위한 교육내용 및 요구도, 교육방법, 참여 의향을 파악하기 위한 서술적 조사연구이다.
Results : 간이식 코디네이터의 경력은 평균 9.2 년 이였으며, HOPO 소속의 코디네이터가 8 명(50%)이며 이식코디네이터의 업무만 수행하는 응답자는 6 명(37%), 이식코디네이터와 뇌사관리를 같이 하고 있는 경우는 10 명(63%)으로 나타났다. 응답자 모두 정기적인 교육이 필요하다고 응답하였고 정기적인 교육에 참석하겠다는 응답도 100%로 나타났다. 교육 요구가 높은 내용으로는 '전문가적인 의사소통기술' 항목이 가장 높았고 '생체 기증자의 수술 방법 및 수술 전후 관리', '사례 관리', '간이식 퇴원 후 일상생활 관리', '생체 기증자 회복 과정 및 일상생활 관리', '기증자의 수술 전후 스트레스 관리', '간이식 코디네이터의 역할', '간이식 수혜자와 기증자를 위한 지원 제도' 항목의 교육 요구도가 높음을 확인할 수 있었다.
Conclusions : 본 연구는 간이식 코디네이터 대상 전문교육 구성 시 교육내용, 요구도, 방법 및 참여도 파악의 조사연구가 시도되었다. 이상의 결과는 간이식 코디네이터를 위한 전문교육과정교육 개발의 기초자료로 사용될 것이며, 국내 간이식에서 간이식 코디네이터의 업무의 질 향상을 위해 도움이 될 것으로 예상된다.