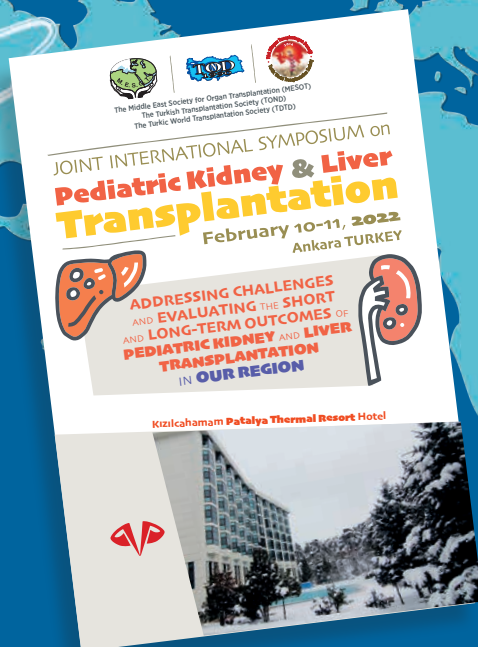
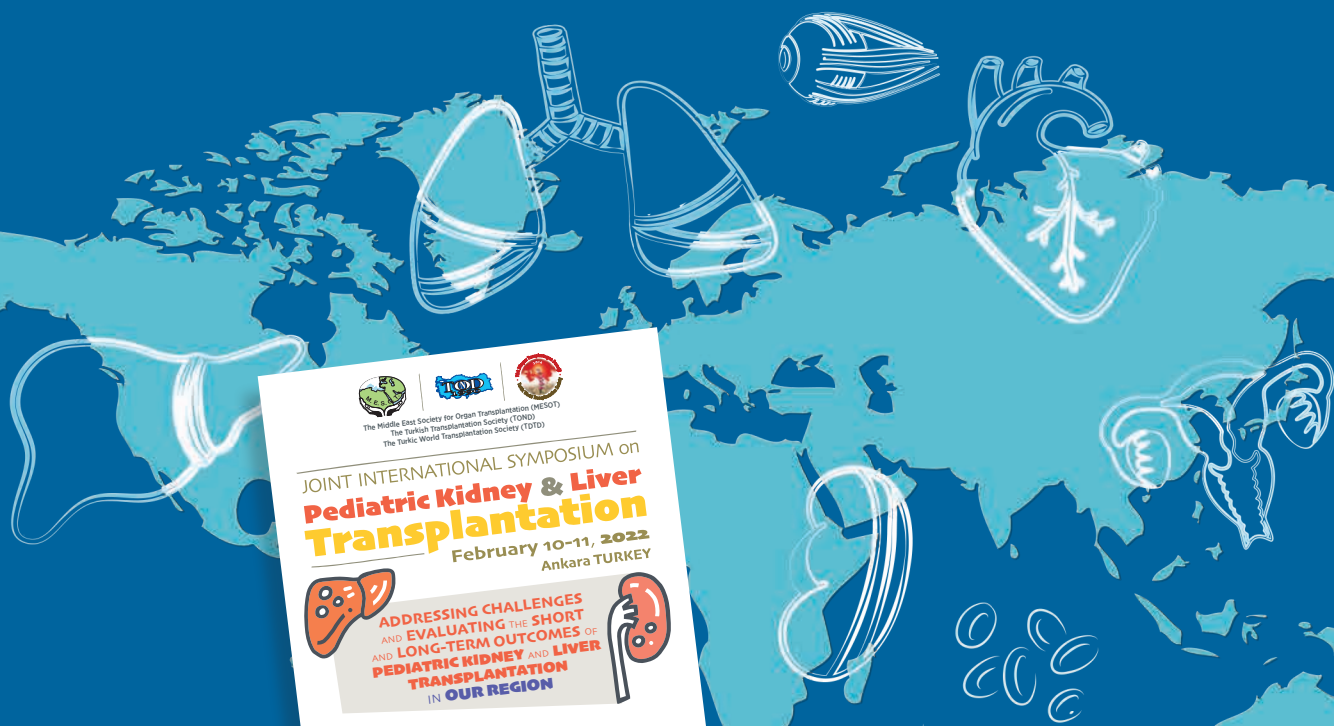


# EXPERIMENTAL AND CLINICAL TRANSPLANTATION



*Program & Abstract Book*



OFFICIAL JOURNAL OF THE MIDDLE EAST SOCIETY FOR ORGAN TRANSPLANTATION

# Experimental and Clinical Transplantation



Official Journal of the Middle East Society for Organ Transplantation

## Editor-in-Chief

Mehmet HABERAL, Ankara, TURKEY

## Honorary Board Members

- \*Thomas E STARZL, Pittsburgh, PA, USA
- \*John S NAJARIAN, Minneapolis, MN, USA
- \*J Wesley ALEXANDER, Cincinnati, OH, USA
- \*George M ABOUNA, Radnor, PA, USA
- \*Nevzat BİLGİN, Ankara, TURKEY
- \*Nebil BÜYÜKPAMUKÇU, Ankara, TURKEY

## Associate Editors

- Mustafa AL-MOUSAWI, Kuwait, KUWAIT
- Hassan ARGANI, Tehran, IRAN
- Antoine BARBARI, Beirut, LEBANON
- Nadey S HAKIM, London, UK
- Refaat R KAMEL, Cairo, EGYPT
- S Ali MALEK HOSSEINI, Shiraz, IRAN
- Marwan MASRI, Beirut, LEBANON
- S A Anwar NAQVI, Karachi, PAKISTAN
- Bassam SAEED, Damascus, SYRIA

## Senior Editorial Board Members

- Roy CALNE, Cambridge, UK
- Jeremy CHAPMAN, Westmead, NSW, AUSTRALIA
- Iradj FAZEL, Tehran, IRAN
- Ahad J GHODS, Tehran, IRAN
- \*Pekka HAYRY, Helsinki, FINLAND
- Josep LLOVERAS, Barcelona, SPAIN
- Ignazio R MARINO, Philadelphia, PA, USA
- Anthony P MONACO, Boston, MA, USA
- S Adibul Hasan RIZVI, Karachi, PAKISTAN
- Faissal A M SHAHEEN, Riyadh, SAUDI ARABIA
- David E R SUTHERLAND, Minneapolis, MN, USA

## Editorial Board Members

- Abdulla A AL-SAYYARI, Riyadh, SAUDI ARABIA
- Gülnaz ARSLAN, Ankara, TURKEY
- Hande ARSLAN, Ankara, TURKEY
- \*Mohamed Adel BAKR, Mansoura, EGYPT
- Behrooz BROUMAND, Tehran, IRAN
- Marcelo CANTAROVICH, Montreal, CANADA
- J Michael CECKA, Los Angeles, CA, USA
- Gabriel E. GONDOLESI, Buenos Aires, ARGENTINA
- Nabil MOHSIN, Muscat, OMAN
- Gökhan MORAY, Ankara, TURKEY
- Shahzad OSSAREH, Tehran, IRAN
- B. Handan OZDEMIR, Ankara, TURKEY
- Nasser SIMFOROOSH, Tehran, IRAN
- Jean-Paul SQUIFFLET, Brussels, BELGIUM
- Alexander H TOLEDO, Chapel Hill, NC, USA
- Andreas G TZAKIS, Miami, FL, USA
- Magdi YAQOOB, London, UK
- Hasan YERSIZ, Los Angeles, CA, USA

\*Deceased



**BAŞKENT UNIVERSITY**

*publisher*

[www.ectrx.org](http://www.ectrx.org)

Printed by Elma Teknik Basım Matbaacılık Tic. Ltd. Şti.  
İvedik OSB Matbaacılar Sitesi 1516 / 1 Sokak No: 35  
Yenimahalle 06378, Ankara-Türkiye (+90.312) 229 92 65

Date Printed 25 January 2022

Print ISSN 1304-0855  
Online ISSN 2146-8427

## EDITORIAL POLICY

### MISSION

**Experimental and Clinical Transplantation (ECT)** is the official journal of the Middle East Society for Organ Transplantation (MESOT). The Society was originally founded in Turkey in 1987, and was subsequently incorporated at Bern, Switzerland, in 1988 as a non-profit, international, scientific organization comprising 20 countries of the Middle East, North Africa, Mid-Asia, and neighboring nations.

The aim of the journal is to provide a medium forum for where clinical scientists, basic scientists, ethicists, and public health professionals to communicate ideas and advances in the field of experimental and clinical organ and tissue transplantation, and to discuss related social and ethical issues. The topics will be of interest to transplant surgeons, clinicians in all major disciplines and subspecialties, basic science researchers, and other professionals involved with sociological aspects of experimental and clinical transplantation.

**Experimental and Clinical Transplantation** is a peer-reviewed international publication that accepts manuscripts of full-length original articles, case reports, letters to the editor, and invited reviews. It is published in English bimonthly (February, April, June, August, October, and December).

Our editorial team is committed to producing a journal of extremely high standards. The journal is fully indexed in EBSCO, Excerpta Medica, Index Medicus, Journal Citation Reports/ Science Edition, MEDLINE, Science Citation Index Expanded™, and Turkey Citation Index. Full-text articles are available on the Internet via PubMed or at the Journal's Web site, at <http://www.ectrx.org>. ECT is also available as hard-copy bound volumes by subscription, printed on acid-free paper.

### SCOPE

The scope of the journal includes the following:

- Surgical techniques, innovations, and novelties
- Immunobiology and immunosuppression
- Clinical results
- Complications
- Infection
- Malignancies
- Organ donation
- Organ and tissue procurement and preservation
- Sociological and ethical issues
- Xenotransplantation

### ETHICS

The Journal expects that all procedures and studies involving human subjects have been reviewed by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in **The Helsinki Declaration** as well as **The Declaration of Istanbul on Organ Trafficking and Transplant Tourism**. Manuscripts must contain a statement to this effect.

**All authors are required to sign an ethical disclosure form** stating that they have not been involved in commercial transactions or other unethical practices in obtaining donor organs, and that no organs or tissues from executed prisoners have been used in this research.

**Experimental and Clinical Transplantation** adheres to the ethical principles outlined by COPE (Committee on Publication Ethics).

### SUBSCRIPTION RATES

#### MESOT Members\*

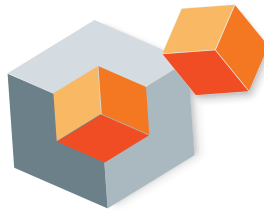
Single Issue: \$20.00  
Annual Subscription: \$100.00

#### Non- MESOT Members

Single Issue: \$50.00  
Annual Subscription: \$250.00

#### Institutions

Annual Subscription: \$1000.00



\* These rates and terms are not applicable, if membership dues not paid for two consecutive years.

*Twelve issues per year, appearing in January, February, March, April, May, June, July, August, September, October, November and December*

#### Shipping Outside Turkey

- Surface Delivery: No additional charge
- Air Mail Delivery: Add \$8.00 extra

**Yayın Adı:** Experimental and Clinical Transplantation

**Yayın Türü:** Yerel süreli yayın

**Yayın Şekli:** Aylık-İngilizce

**Yayın Sahibi:** Başkent Üniversitesi adına Mehmet Haberal

**Sorumlu Yazı İşleri Müdürü:** Mehmet Haberal

**Yayının İdare Adresi:** Taşkent Cad. No:77

06490 Bahçelievler, Çankaya, Ankara

**Name of the Journal:** Experimental and Clinical Transplantation

**Type of Publication:** Academic Journal

**Type of Release:** Bimonthly - English

**Publisher:** Mehmet Haberal on behalf of Baskent University

**Editor in Chief:** Mehmet Haberal

**Address:** Taskent Cad. No:77

06490 Bahçelievler, Cankaya, Ankara

# EDITORIAL POLICY FOR **LIVING DONOR TRANSPLANTATION**

Dear Colleagues,

**Kindly be reminded** of our Editorial Policy regarding **Living Donation** in transplantation.

**As per our acceptance criteria, donor must be a relative (up to the 4<sup>th</sup> degree) or spouse of the recipient and over 18 years old.** We would like to **remind** all of you that as per our Journal policy, we do not accept any papers that involve transplantation from **living unrelated donors**.

In the recent period (from January 2019 to present), 662 manuscripts have been submitted to our Journal from various countries throughout the world. Out of these 662 manuscripts, a decision has been made for 554 manuscripts and **377 (68%)** of them were **rejected**. Of these 377 rejected manuscripts, **55 (14.6%)** of them have been rejected as they involved transplantation from **unrelated living donors**.

We hope that an increase in such policies will help to underline the importance of the legal and ethical aspects of transplantation. Please feel free to contact us regarding any comments as our aim is to contribute to the transplantation field in the world.

Please keep safe and healthy during these times of Covid-19 pandemic.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Haberal', written in a cursive style.

**Mehmet Haberal, MD, FACS (Hon), FICS (Hon),  
FASA (Hon), FIMSA (Hon), Hon FRCS (Glasg)**  
Editor-in-Chief  
Experimental and Clinical Transplantation





Committed to Access and Transparency

**TTS2022** | BUENOS AIRES ARGENTINA  
September 10-14

29<sup>th</sup> International Congress of The Transplantation Society

[www.tts2022.org](http://www.tts2022.org)



**SAVE THE DATE**

for the leading global congress in transplantation!

10-14 September 2022

[www.tts2022.org](http://www.tts2022.org)



The  
**Transplantation**  
Society



SOCIEDAD ARGENTINA  
DE TRASPLANTES



**STALYC**  
Sociedad de Trasplante de  
América Latina y el Caribe





# 18<sup>th</sup> Congress of the

## Middle East Society for Organ Transplantation



# 2023 ANKARA

May 24-26 [www.mesot2023.com](http://www.mesot2023.com)

### ENDORSED BY

The Transplantation Society (TTS)

The Turkish Transplantation Society (TOND)

The Turkic World Transplantation Society (TDTD)



### Congress Organizer

Şehit Temel Kuşuoğlu Cad.,  
Yonca Apt. No: 28 / 4  
Bağçelievler, Ankara 06490 Turkey  
Phone: +90 312 215 51 60  
Fax: +90 312 215 14 85  
[www.buto-org.com](http://www.buto-org.com)

### Congress Secretariat

Taskent Caddesi, No:77, Kat 2,  
Bahçelievler, Ankara, 06490 Turkey  
Phone: +90 (312) 212 73 93  
Fax: +90 (312) 215 08 35  
[rectorate@baskent.edu.tr](mailto:rectorate@baskent.edu.tr)



# TTS 2024

# 30<sup>TH</sup>

# INTERNATIONAL CONGRESS OF THE TRANSPLANTATION SOCIETY



ISTANBUL, TURKEY [www.tts.org](http://www.tts.org)







# The Transplantation Society

NGO in official relations with the  
World Health Organization (WHO)

## Join TTS TODAY!

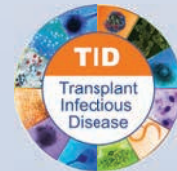
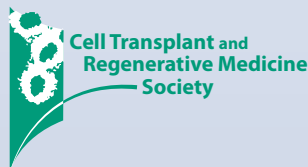
### BENEFITS INCLUDE:

- The opportunity to be part of the leading global network of physicians, surgeons and basic scientists involved in transplantation, representing more than 105 countries around the world
- Free online access to the *Transplantation* journal and free educational material on the Society's website
- Access to our multimedia library with over 5000 presentations
- Opportunities for Travel grants for Young Investigator Awards
- Members from emerging economy nations are entitled to a 50% rebate on TTS dues which may be combined with the TTS rebate for Section dues

... and much more

Visit us online at [www.tts.org](http://www.tts.org) for more information

### Official Sections of TTS



By joining TTS there is no **BETTER** way to invest in

# YOUR CAREER

and in one of the most  
dynamic professions  
in medical science

# TODAY





# The Middle East Society for Organ Transplantation

MESOT welcomes professionals actively involved in all fields of transplantation.

## *The benefits of membership:*

- The opportunity to be part of a regional network of physicians, surgeons and scientists involved in transplantation
- Free online access to the journal “Experimental and Clinical Transplantation”, the official journal of The Middle East Society for Organ Transplantation
- Substantially reduced rates for subscription to print copies of “Experimental and Clinical Transplantation”
- Entitlement to apply to take part in a fellowship program in one of several leading transplantation centers in the Middle East
- Reduced registration fee at the biennial international congresses which provide an innovative and comprehensive overview of the latest research developments in the field transplantation
- Free online access to the “Transplant Library”
- MESOT newsletter updating members about the latest activities in the transplant community
- Access to the online MESOT Member Directory

Apply online today at <http://www.mesot-tx.org>

## Experimental and Clinical Transplantation

*Official Journal of the Middle East Society for Organ Transplantation*

[www.ectrx.org](http://www.ectrx.org)





# MESOT Fellowship Program in Organ Transplantation

The Middle East Society for Organ Transplantation is pleased to announce the establishment of the MESOT Fellowship Program. The program, which will be 1-2 years in duration, has been created for physicians and surgeons from the Middle East region willing to acquire particular skills related to clinical and medical aspects of organ transplantation.

The objective of this program is to promote and advance organ transplantation in underserved areas of the region by helping physicians to establish new programs or improve already existing ones. In addition to liver, kidney, pancreas, heart and cornea transplant fellowships, training will be offered in various other departments to support the multidisciplinary nature of transplantation, including gastroenterology, nephrology, cardiology, immunology, radiology, pathology, infectious diseases and intensive care.

A limited number of grants will also be available, with recipients being determined by the Fellowship Program Committee.

Further information can be found online at <http://www.mesot-tx.org/home/fellowship.php>, where candidates may also apply online. The application deadline is the 30<sup>th</sup> of June of each year.

Inquiries may be directed to the Chairman of the MESOT Fellowship Program Committee:

**Mustafa Al-Mousawi, MD, FRCS**

Chairman, MESOT Fellowship Program Committee

P.O. Box 288, Safat 13003

Kuwait

**Fax:** +965 24848615

**Email:** [drmosawi@yahoo.com](mailto:drmosawi@yahoo.com)



AMERICAN COLLEGE OF SURGEONS

AMERICAN COLLEGE  
OF SURGEONS

*Inspiring Quality:  
Highest Standards,  
Better Outcomes*

# I'm a general surgeon.

# Why should I join the ACS?

*The College's top priority is providing value for its members. Become a member and take advantage of the following opportunities and resources for general surgeons.*

Join the **LARGEST AND STRONGEST VOICE SUPPORTING GENERAL SURGEONS IN CONGRESS** and in front of important regulatory agencies by supporting the American College of Surgeons Professional Association Political Action Committee (ACSPA-SurgeonsPAC).

Improve the quality of care at your hospital by joining an **ACS QUALITY PROGRAM** like the ACS National Surgical Quality Improvement Program® (ACS NSQIP®), the leading national program for a risk-adjusted, outcomes-based approach to improving surgical care.

Improve the care of the surgical patient by making sure your program is accredited by the **COMMISSION ON CANCER (CoC)**, using education programs offered by Committee on Trauma (COT), and participating in the ACS clinical trials group in oncology.

Benefit from **OPPORTUNITIES FOR INCREASED COLLEGIALITY**, the ability to know and work with other surgeons and surgical specialties.

Use the **ACS SURGEON SPECIFIC REGISTRY (SSR)** to track your cases and outcomes in a convenient, easy-to-use way. This system allows ACS members to compare their outcomes with others in a confidential manner, supports Part 4 of Maintenance of Certification (MOC), and provides for electronic transmittal of cases to the American Board of Surgery for recertification.

Attend the **CLINICAL CONGRESS**, the College's premier annual meeting and the largest, most comprehensive surgeon-specific CME event in the world, and take advantage of the educational resources available. This five-day event offers high-quality educational programs designed to educate and train surgeons and improve the health and safety of surgical patients. Reduced registration is available for ACS members.

Benefit from **EDUCATION RESOURCES AND COURSES**, including the Surgical Education and Self-Assessment Program (SESAP), *Selected Readings in General Surgery (SRGS)*, and Fundamentals of Laparoscopic Surgery (FLS).

Apply for **SURGICAL RESEARCH OPPORTUNITIES AND TRAVEL SCHOLARSHIPS AND FELLOWSHIPS** available for Fellows, international surgeons, Associate Fellows, and Resident Members.



Access the **ACS CAREER CONNECTION** to find new opportunities in your surgical career. Use this free resource to post your resume and search for job opportunities in general surgery.

Attend the robust **ACS MEDICAL STUDENT PROGRAM**, an opportunity to meet College leaders and surgical educators at both the medical student and resident levels.

Participate in **OPERATION GIVING BACK**, the ACS volunteerism initiative and a comprehensive resource center, to find information and participate in volunteer opportunities.

Be included in the **FIND-A-SURGEON DATABASE** to help patients find you and share your profile and practice information with the public.

Become active in the **ACS AT A NATIONAL OR CHAPTER LEVEL** and gain the opportunity to work with a dedicated group of like-minded volunteers, especially on matters related to federal and state legislative advocacy.

Benefit from **LEADERSHIP TRAINING** and grow professionally by taking a leading role on College committees and in College Chapters.

Join the **ACS GENERAL COMMUNITY**, an exclusive online forum that allows members to share in online discussions, view online videos and full text articles, and share thoughts on difficult cases.

Participate in the **ACS TRANSITION TO PRACTICE PROGRAM**, which helps graduating residents transition into independent practice.

Promote **VOLUNTARY PHILANTHROPIC EFFORTS** by supporting the ACS Foundation.

The American College of Surgeons is the largest organization of surgeons in the world, uniquely positioned to lead the way in optimal patient care, surgical research, health policy, and continuing education and networking opportunities. It is the single strongest voice for surgeons in all specialties and, since its foundation in 1913, has been at the forefront of providing quality care for surgical patients and supporting surgeons wherever they practice.

### **BECOME AN ACS MEMBER TODAY!**

Start taking advantage of the exclusive benefits available only to ACS members.

FACS indicates a commitment to quality and is well recognized by referring surgeons.



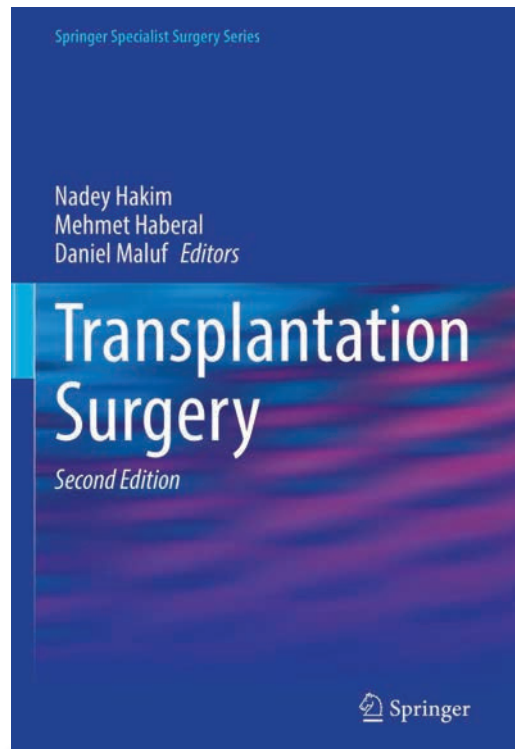
Scan the QR code or visit [www.facs.org/member-services/join](http://www.facs.org/member-services/join) to fill out your membership application.



Nadey Hakim, Mehmet Haberal, Daniel Maluf (Eds.)

# Transplantation Surgery

Series: Springer Specialist Surgery Series



- Each chapter contains key questions to highlight main points
- Covers entire topic within a single volume
- Written from a global perspective by experts in the field

This updated volume gives a clear description of transplantation surgery and covers the recent developments and innovations that have occurred within the field. New chapters on the management of graft dysfunction, organ preservation, new immunosuppressive drugs, molecular medicine and transplantation, robotics in transplantation, and organ bio-engineering are included. The book aims to be an authoritative guide to transplantation surgery that will help improve the likeliness of procedures being successful. This book will be relevant to transplant surgeons, physicians, and nephrologists.





**BAŞKENT  
UNIVERSITY**

# International Center for Transplant Ethics

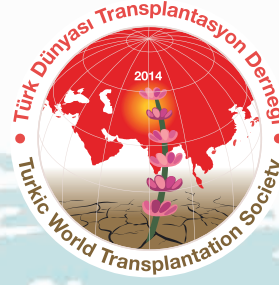
We are proud to announce the establishment of the International Center for Transplant Ethics under the aegis of the World Academy of Medical, Biomedical and Ethical Sciences at Başkent University

**The center's mission is:**

- to provide leadership in ethical activities and policy
- to promote ethical activities in transplantation
- to introduce ethically sound procurement policies and practice in order to prevent exploitation of individuals as organ providers based on human dignity and human rights.







## Turkish Transplantation Society (TOND)

Founder Professor Mehmet Haberal,  
Founded in 1990.

Aims to promote and encourage research and education in the field of organ transplantation, to partake in national and international scientific activities and to ensure communication between organizations alike.

The primary goals of TOND are:

- To collaborate with other organizations alike in Turkey and to organize meetings, symposiums and conferences
- To inform and educate the public at large on organ transplantation by means of publications and conferences
- To organize programs which will promote organ donation and its importance in saving lives
- To ensure the training of qualified personnel in the field of organ transplantation and encourage research by means of funds
- To collaborate with existing international organizations alike to promote and encourage scientific research
- To work on ethical and legal aspects of organ transplantation and related fields and to encourage social and medical collaboration of organizations alike.

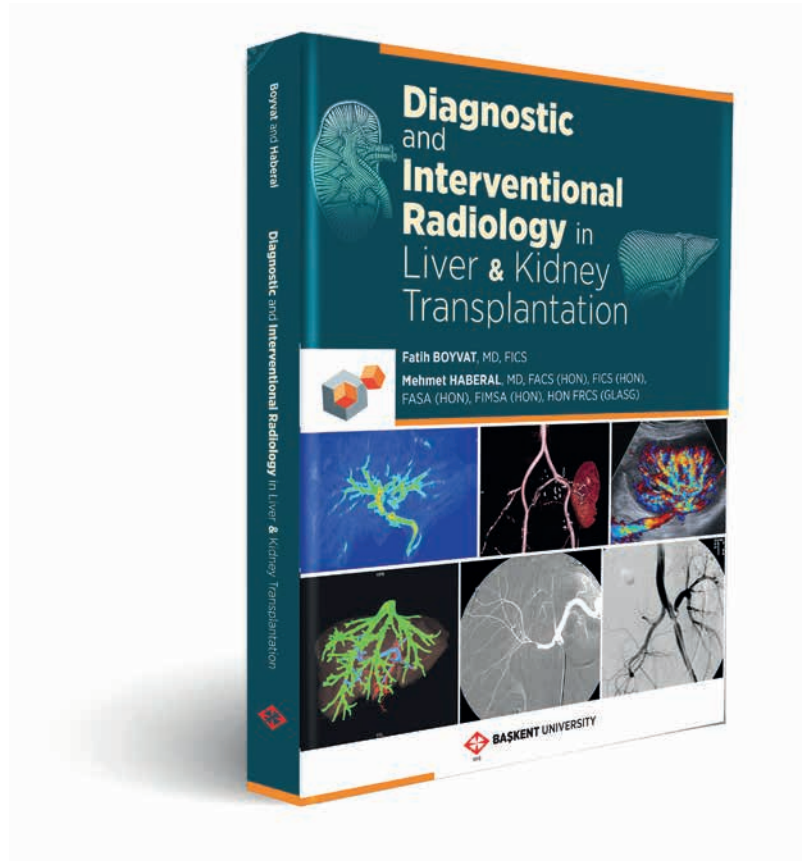
## Turkic World Transplantation Society (TDTD)

Founder Professor Mehmet Haberal,  
Founded in December 2014.

Aims to create an arena of communication and collaboration in the field of organ transplantation among the Turkic States of the world. Inclusive of Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, the society already has a total of 485 members from all member countries.

The primary goals of TDTD are:

- To promote and encourage education, research and cooperation in the field of organ transplantation for the purpose of advancing the art and science of transplantation, and to serve the patients of these states through the application of new knowledge and technical advances
- To create a scientific forum for the discussion of all problems related to the field of transplantation, including medical, social and legal aspects
- To collaborate with existing public and private organizations to promote and encourage research and clinical applications related to transplantation, and to participate and assist in the promotion of organ procurement and donation
- To encourage meetings, symposia and congresses to fulfill the above objectives



# Diagnostic and Interventional Radiology in Liver & Kidney Transplantation

**Fatih BOYVAT**, MD, FICS

**Mehmet HABERAL**, MD, FACS (HON), FICS (HON),  
FASA (HON), FIMSA (HON), HON FRCS (GLASG)

Transplant medicine remains one of the most challenging and complex areas of modern medicine. Although important medical breakthroughs such as immunosuppressive drugs have allowed for more organ transplants and a longer survival rate, transplant professionals still face serious problems, especially with regard to achieving correct diagnosis and treating postoperative complications.

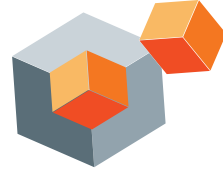
Advances in imaging techniques, including in computed tomography, magnetic resonance imaging, and ultrasonography, and the use of interventional radiology have allowed transplant professionals to provide more accurate results both for diagnosis and for treatment of complications that occur after liver and kidney transplant. Moreover, with the use of interventional radiology, transplant professionals can now reach deep structures of the body, enabling correct diagnoses and treatment without performing surgery.

*Publisher*  **BAŞKENT  
UNIVERSITY**  
1993

Editorial Office  
Taskent Caddesi, No:77, Kat 4, Bahcelievler  
Ankara, 06490 Turkey  
Telephone: +90 (312) 212 73 93 Fax: +90 (312) 215 08 35  
rectorate@baskent.edu.tr



**BAŞKENT UNIVERSITY**  
FACULTY OF MEDICINE  
DEPARTMENT OF GENERAL SURGERY



DIVISION OF  
TRANSPLANTATION

# Kidney & Liver Transplantation Observer & Fellowship Programs



[www.baskent.edu.tr](http://www.baskent.edu.tr)



## Welcome Message



Dear Colleagues,

As Founder and Past-President of the Middle East Society for Organ Transplantation (MESOT), Founder and President of the Turkish Transplantation Society (TOND), and the Turkic World Transplantation Society (TDTD), it is my great honor and privilege to welcome you to the **Joint International Symposium on Pediatric Kidney and Liver Transplantation** that will take place as a hybrid meeting on **February 10-11, 2022**, at the Kizilcahamam Thermal Resort Hotel in **Ankara, Turkey**.

The Symposium will address challenges and evaluate the short and long-term outcomes of pediatric kidney and liver transplantation in our region including the Middle East and Mid Asia. During the Symposium we aim to stimulate thoughts and discussions around the latest developments and the current practices in the field of pediatric kidney and liver transplantation. The program will embrace keynote lectures by world-renowned professionals from the world, abstract presentations and more.

**Even though we would like to welcome you to Ankara in person, if current situation remains unchanged we would be equally pleased to meet you online and exchange ideas virtually.**

I look forward to welcoming you all to our capital city, Ankara, for what I believe shall be an outstanding meeting.

Yours sincerely,

A handwritten signature in blue ink that reads "m. Haberal".

**Mehmet Haberal, MD, FACS (Hon), FICS (Hon),  
FASA (Hon), FIMSA (Hon), Hon FRCS (Glasg)**

Chair, Joint International Symposium on *Pediatric Kidney and Liver Transplantation*

Founder and Founder President, Baskent University

President of the Executive Supreme Board, Baskent University

Chair, Baskent University Division of Transplantation

Founder and President, Turkish Transplantation Society

Founder and President, Turkic World Transplantation Society

Founder and Past President, Middle East Society for Organ Transplantation

Immediate Past-President, The Transplantation Society

Distinguished Fellow, Royal Society of Medicine

Editor-in-Chief, *Experimental and Clinical Transplantation*

## Executive Councils



### Executive Council of the TURKISH TRANSPLANTATION SOCIETY

<b>President</b>	Mehmet Haberal
<b>Vice-President</b>	Hüseyin Gülay
<b>Secretary</b>	Gökhan Moray
<b>Treasurer</b>	Gülnaz Arslan
<b>Members</b>	Haldun Müderrisoğlu, Figen Özçay, Esra Baskın



### Executive Council of the TURKIC WORLD TRANSPLANTATION SOCIETY

<b>President</b>	Mehmet Haberal
<b>Vice President</b>	Gülnaz Arslan
<b>Secretary</b>	Gökhan Moray
<b>Treasurer</b>	Fatih Boyvat
<b>Member</b>	Haldun Selçuk

### Representatives

<b>Azerbaijan</b>	Fariz Babayev, Hikmet Ismailov
<b>Kazakhstan</b>	Abay K. Baigenzhin, Jaksılık Doskaliyev
<b>Kyrgyzstan</b>	Mira Isaeva, Kamchibek A. Uzakbaev
<b>Tajikistan</b>	Saidmahmud Ismoilov
<b>Turkmenistan</b>	Bayriyev Vepa
<b>Uzbekistan</b>	Yuldashev Ulugbeg Karimovic



**Executive Council of the  
MIDDLE EAST SOCIETY FOR ORGAN TRANSPLANTATION**

<b>President</b>	Antoine Barbari
<b>President-Elect</b>	Mohammad Ghnaimat
<b>Immediate Past-President</b>	Refaat Kamel
<b>Vice President</b>	Hassan Argani
<b>Secretary</b>	Mohamed Hani Hafez
<b>Treasurer</b>	Esra Baskın

**Representatives**

<b>Iraq</b>	Ala Ali
<b>Saudi Arabia &amp; Gulf States</b>	Saeed M. G. Alghamdi Ahmed Alqallaf
<b>Mid Asia</b>	Fariz Babayev Rehan Mohsin
<b>Eastern Meditarreanean</b>	Hiba Barghouthi Ammar Raiy
<b>North Africa Representative</b>	May Hasaballah Habchi Khadidja
<b>Turkey</b>	Gökhan Moray
<b>Iran</b>	Saman Nikeghbalian





JOINT INTERNATIONAL SYMPOSIUM on  
**Pediatric Kidney & Liver**  
**Transplantation**  
February 10-11, 2022  
Ankara TURKEY



## **Scientific Committee**

### **Chair**

Mehmet Haberal

### **Members**

Mustafa Al-Mousawi *Kuwait*

Gülnaz Arslan *Turkey*

Antoine Barbari *Lebanon*

Esra Baskın *Turkey*

Fatih Boyvat *Turkey*

Mehmet Coşkun *Turkey*

Mohammad Ghnaimat *Jordan*

Nadey Hakim *UK*

Refaat Kamel *Egypt*

Seyed Ali Malek-Hosseini *Iran*

Marwan Masri *Lebanon*

Gökhan Moray *Turkey*

S. Anwar Naqvi *Pakistan*

Figen Özçay *Turkey*

Handan Özdemir *Turkey*

S. Adibul H. Rizvi *Pakistan*

Bassam Saeed *Syria*

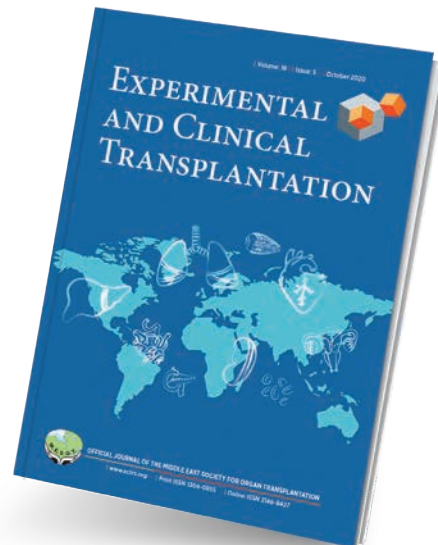
Faissal A. M. Shaheen *Saudi Arabia*

Adnan Torgay *Turkey*

## International Faculty

Mustafa Al-Mousawi *Kuwait*  
Hassan Argani *Iran*  
Nancy Ascher *USA*  
Antoine Barbari *Lebanon*  
Marcelo Cantarovich *Canada*  
Jeremy R. Chapman *Australia*  
Francis L. Delmonico *USA*  
Fatina Fadel *Egypt*  
Mohammad Ghnaimat *Jordan*  
Mohamed Hani Hafez *Egypt*  
Nadey Hakim *UK*  
Refaat Kamel *Egypt*  
Vivek Kute *India*  
Seyed Ali Malek-Hosseini *Iran*  
Ignazio R. Marino *USA*  
Marwan Masri *Lebanon*  
Mignon McClulloch *South Africa*  
Elmi Muller *South Africa*  
S. Anwar Naqvi *Pakistan*  
Philip O'Connell *Australia*  
S. Adibul H. Rizvi *Pakistan*  
Gamal Saadi *Egypt*  
Bassam Saeed *Syria*  
Faissal A. M. Shaheen *Saudi Arabia*  
Antoine Stephan *Lebanon*  
Hasan Yersiz *USA*

All  
accepted abstracts  
will be published  
in the journal  
**Experimental  
and Clinical  
Transplantation**



## Supported by

Başkent University  
 World Academy of Medical, Biomedical and Ethical Sciences (WAMBES)  
 International Transplant Foundation (ITF)  
 Turkish Transplantation Foundation  
 International Haberal Transplantation and Education Foundation (IHTEF)  
 Haberal Education Foundation (HEV)  
 Başkent University Improvement Foundation (BÜGEV)  
 Channel B  
 Patalya Thermal Resort Hotel Kızılcahamam  
 Patalya Hotel Gölbaşı  
 Açkar Dairy Products  
 Alaf Manufacture  
 Per Agriculture and Animal Breeding  
 Başkent Affiliated Companies



**BAŞKENT  
UNIVERSITY**





# Scientific Program

## Thursday, February 10

**08:00-17:00** On-Site Registration

**08:00-08:30** Opening Ceremony

### Opening Remarks

#### Mehmet Haberal

*Founder and Past-President, MESOT*

*Founder and President, TOND*

*Founder and President, TDTD*

**Antoine Barbari** *President, MESOT*

**Gamal Saadi** *President, ASOT*

**08:30-08:45** Coffee Break

---

**08:45-10:50** Session 1A: Pediatric Kidney Transplantation

**Chairpersons:** *Jeremy R. Chapman*

*Antoine Barbari*

*Mohammad Ghnaimat*

*Mehmet Haberal*

**08:45-09:10** **L1** **Faissal A. M. Shaheen** (*KSA*)  
Challenges in Pediatric Kidney Transplantation: A Middle East Perspective

**09:10-09:35** **L2** **Bassam Saeed** (*Syria*)  
Pediatric Kidney Transplantation in the Middle East: Challenges and Solutions

**09:35-10:00** **L3** **Mustafa Al-Mousawi** (*Kuwait*)  
Pediatric Kidney Transplantation in Kuwait

**10:00-10:25** **L4** **Nadey Hakim** (*UK*)  
Pediatric Kidney Transplantation in Africa: 1 Case Report

**10:25-10:50** **L5** **Mignon McCulloch** (*South Africa*)  
Challenges and Opportunities in Pediatric Kidney Transplantation in Lower- and Middle-Income Countries (LMIC)

**10:50-11:05** Coffee Break

---

**11:05-12:35 Session 2A: Pediatric Kidney Transplantation**

**Chairpersons:** *Nadey Hakim*  
*Esra Baskin*  
*Hassan Argani*  
*Feza Yarbug Karakayali*

- 11:05-11:15 O1 Oleg Godik (Ukraine)**  
 Launching Pediatric Kidney Transplant Program in "Okhmatdyt":  
 First Steps, Current Issues, Perspective
- 11:15-11:25 O2 Isakov Samat (Kazakhstan)**  
 The Comprehensive Program on Renal Transplant for Children in  
 National Mother and Child Science Center
- 11:25-11:35 O3 A. A. Ismatov (Uzbekistan)**  
 The Features of Kidney Transplantation with Congenital Anomalies  
 of the Urinary Tract Development: A Practice Case
- 11:35-11:45 O4 B. Handan Ozdemir (Turkey)**  
 Prognostic Significance of the Simultaneous Vascular Rejection  
 in Pediatric Patients with Antibody-Mediated Rejection (AMR) in  
 Renal Allografts
- 11:45-11:55 O5 F. Irem Yesiler (Turkey)**  
 Pediatric Renal Transplant Recipients Admitted to the Intensive  
 Care Unit: A Retrospective Study
- 11:55-12:05 O6 Begum Avci (Turkey)**  
 Association Between Vitamin D Deficiency and Anemia in Pediatric  
 Renal Transplant Recipients
- 12:05-12:15 O7 B. Handan Ozdemir (Turkey)**  
 The Beneficial Impact of D3 Vitamin on the Decline of Rejection,  
 Epithelial-Mesenchymal Transition (EMT), and Interstitial Fibrosis  
 Among Pediatric Renal Transplant Patients
- 12:15-12:25 O8 S. Kiladze (Georgia)**  
 Results of Kidney Transplantation in "Tbilisi State Medical  
 University and Ingorokva High Medical Technology University  
 Clinic LLC"
- 12:25-12:35 O9 B. Altinova (Kazakhstan)**  
 Pediatric Kidney Transplantation Experience in Kazakhstan
- 12:35-13:30 Lunch**

---

**13:30-15:50 Session 3A: Pediatric Kidney Transplantation**

**Chairpersons:** *Faissal A. M. Shaheen*  
*Rezan Topaloglu*  
*Mignon McCulloch*  
*Philip O'Connell*

- 13:30-13:55 L6 Gamal Saadi (Egypt)**  
Donor Selection and Outcome for Pediatric Live Donation Kidney Transplantation
- 13:55-14:20 L7 Mohammad Ghnaimat (Jordan)**  
Updates on Post Transplant Diabetes
- 14:20-14:45 L8 Hani Hafez (Egypt)**  
New Immunosuppressive Strategies to Achieve Better Compliance and Results
- 14:45-15:10 L9 Hassan Argani (Iran)**  
Cardiac Death Donation
- 15:10-15:20 O10 Gani Kuttymuratov (Kazakhstan)**  
Experience in Kidney Transplantation in Children with Steroid-Resistant Nephrotic Syndrome
- 15:20-15:30 O11 B. Handan Ozdemir (Turkey)**  
Renal Poly (ADP-Ribose) Polymerase (PARP) Expression Augments the Development of Epithelial-to-Mesenchymal Transition (EMT), Transplant Glomerulopathy, and Interstitial Fibrosis in Pediatric Patients with Antibody-Mediated Rejection
- 15:30-15:40 O12 Emre Leventoglu (Turkey)**  
An Unusual Cause of Elevated Serum Creatinine After Kidney Transplantation in an Adolescent
- 15:40-15:50 O13 Evra Celikkaya (Turkey)**  
Clinical Different Presentation of Family Members with the Same Homozygote DGKE Mutation: A Case Series
- 15:50-16:05 Coffee Break**



---

**16:05-18:05 Session 4: Pediatric Kidney Transplantation in Covid-19 Era**

**Chairpersons:** *Mustafa Al-Mousawi*  
*Hani Hafez*  
*Burak Sayin*  
*Gamal Saadi*

- 16:05-16:30 L10 Jeremy Chapman (Australia)**  
 Scientific Publishing Under COVID Stress: Can We Make It More Useful?
- 16:30-16:55 L11 Antoine Barbari (Lebanon)**  
 COVID-19 Vaccination in Children with Solid Organ Transplant: Critical Appraisal
- 16:55-17:20 L12 Marwan Masri (Lebanon)**  
 Covid-19 and Allograft Rejection
- 17:20-17:45 L13 Vivek Kute (India)**  
 Outcomes of SARS-CoV-2 Among Pediatric Waitlisted and Kidney Transplant Recipients: A Single-Center, Observational Study from India
- 17:45-17:55 O14 Aysun Caltik Yilmaz (Turkey)**  
 Covid-19 Infections and Pediatric Renal Transplant Recipients
- 17:55-18:05 O15 Meraj Alam Siddiqui (Turkey)**  
 Use of Eculizumab In Pediatric Patients with Late Antibody-Mediated Rejection After Kidney Transplantation
- 18:30-19:00 Orchestra Academic Baskent Concert**  
*Kizilcahamam Patalya Resort Hotel*
- 19:00-21:00 Welcome Reception**  
*Kizilcahamam Patalya Resort Hotel*

## Friday, February 11

**08:00-12:00 On-Site Registration**

**08:30-10:30 Session 5A: Pediatric Liver Transplantation**

**Chairpersons:** Ignazio R. Marino  
Gokhan Moray  
Fatih Boyvat  
Hasan Yersiz

- 08:30-08:55 L14 S. Ali Malek-Hosseini (Iran)**  
The Largest Single-Center Report on Pediatric Liver Transplantation
- 08:55-09:20 L15 Refaat Kamel (Egypt)**  
Egyptian Experience in Pediatric Liver Transplantation
- 09:20-09:30 O16 Gani Kuttymuratov (Kazakhstan)**  
Pediatric Liver Transplantation: The Experience of a Single Center
- 09:30-09:40 O17 Ebru H. Ayvazoglu Soy (Turkey)**  
Predisposing Risk Factors Affecting the Early Outcome in Liver Transplant Patients Younger Than 3 Years
- 09:40-09:50 O18 Emre Karakaya (Turkey)**  
An Alternative Abdominal Closure Technique After Pediatric Liver Transplant: Bogota-Bag Technique
- 09:50-10:00 O19 Ozgur Ozen (Turkey)**  
Endovascular Treatment of Active Bleeding After Pediatric Liver Transplantation
- 10:00-10:10 O20 Nazira Yerimova (Kazakhstan)**  
Immunological Aspects of the Cytomegalovirus Infections After Pediatric Liver Transplantation
- 10:10-10:20 O21 Ersin Gumus (Turkey)**  
Salvage Liver Transplantation in the Treatment of a Child with Local Recurrence of Hepatoblastoma: A Case Report
- 10:20-10:30 O22 Meraj Alam Siddiqui (Turkey)**  
Clinical Features and Outcomes Following SARS-Cov-2 Infection in Pediatric Liver Transplant Patients
- 10:30-10:45 Coffee Break**

---

**10:45-12:35 Session 6A: Pediatric Liver Transplantation**

**Chairpersons:** *Marwan Masri*  
*Figen Ozcay*  
*Sedat Boyacioglu*  
*S. Ali Malek-Hosseini*

- 10:45-11:10 L16 Ignazio R. Marino (USA)**  
 Orthotopic Liver Transplantation in Children: Tools for Long-Term Follow-Up
- 11:10-11:35 L17 Hasan Yersiz (USA)**  
 Expanding the Pediatric Liver Donor Pool without Compromising the Adult Liver Pool. Split Liver Transplantation; Technical Considerations
- 11:35-11:45 O23 Emre Karakaya (Turkey)**  
 Vascular Complications in Pediatric Liver Transplants and Their Management
- 11:45-11:55 O24 Behlul Igus (Turkey)**  
 The Role of Interventional Radiology in the Management of Early Vascular Complications After Pediatric Liver Transplantation
- 11:55-12:05 O25 Hazel Delal Dara Kar (Turkey)**  
 Pediatric Liver Transplantation Indications and Outcomes in Glycogen Storage Disease: A Single Center Experience
- 12:05-12:15 O26 Hakan Ozturk (Turkey)**  
 Long-Term Outcomes of Patients with Progressive Familial Intrahepatic Cholestasis After Biliary Diversion
- 12:15-12:25 O27 Demet Teker Duztas (Turkey)**  
 Progressive Familial Intrahepatic Type-1 Case with Partial External Biliary Diversion After Liver Transplantation
- 12:25-12:35 O28 K. Kashibadze (Georgia)**  
 Development of Liver Transplantation in Georgia
- 12:35-14:00 Lunch**



---

**14:00-15:15 Session 7: Pediatric Kidney and Liver Transplantation**

**Chairpersons:** Refaat Kamel  
Fatih Hilmioglu  
Aydin Dalgic  
Vivek Kute

- 14:00-14:25 L18 Fatina Fadel (Egypt)**  
Pediatric Combined Liver and Kidney Transplantation: A Single Center Experience
- 14:25-14:35 O29 Emre Karakaya (Turkey)**  
Our Pediatric Liver and Kidney Transplant Activities in 2021
- 14:35-14:45 O30 Helin Sahinturk (Turkey)**  
Relationship Between Postoperative Acute Kidney Injury and Early Extubation After Pediatric Liver Transplantation
- 14:45-14:55 O31 Almila Sarigul Sezenoz (Turkey)**  
Macular Vessel Density Measurement in Pediatric Renal and Liver Transplantation
- 14:55-15:05 O32 Gulsah Gokgoz (Turkey)**  
Peripapillary Vessel Density Measurement in Pediatric Renal and Liver Transplantation Patients
- 15:05-15:15 O33 Hayriye Hizarcioglu Gulsen (Turkey)**  
A Fatal Complication of Liver Transplantation: Post-transplant Lymphoproliferative Disease

**15:15-15:30 Coffee Break**

---

**15:30-16:50 Session 8: Complications Following Pediatric Kidney and Liver Transplantation**

**Chairpersons:** Bassam Saeed  
Fatina Fadel  
Sedat Yildirim  
B. Handan Ozdemir

- 15:30-15:40 O34 Begum Avci (Turkey)**  
BK Virus Infection and Risk Factors in Pediatric Patients Undergoing Kidney Transplants

- 15:40-15:50 O35 Emre Leventoglu (Turkey)**  
Encapsulated Peritoneal Sclerosis in an Adolescent with Kidney Transplantation After Long-Term Peritoneal Dialysis
- 15:50-16:00 O36 Khaled Warashne (Turkey)**  
Bile Acid Synthesis Defect Due to Aldo-Keto Reductase 1D1 (AKR1D1) Mutation: An Underdiagnosed Entity Successfully Treated with Liver Transplantation
- 16:00-16:10 O37 Demet Teker Duztas (Turkey)**  
Two Cases with Neonatal Cholestasis and Renal Findings: DCDC2 (Doublecortin Domain Containing 2) Mutation
- 16:10-16:20 O38 Meraj Alam Siddiqui (Turkey)**  
The Role of Platelet-Lymphocyte Ratio and Neutrophil-Lymphocyte Ratio in Predicting the Delayed Graft Function in Pediatric Renal Transplant Patients
- 16:20-16:30 O39 Begum Avci (Turkey)**  
Long Term Outcomes of Renal Transplant Recipients with Juvenil Nephronophthisis
- 16:30-16:40 O40 A. A. Ismatov (Uzbekistan)**  
The Management of Patients with Venous Thrombosis of a Transplanted Kidney in the Early Postoperative Period: A Practice Case
- 16:40-16:50 O41 Bahar Buyukkaragoz (Turkey)**  
Value of Neutrophil-Lymphocyte and Platelet-Lymphocyte Ratios in the Evaluation of Acute Rejection and Chronic Allograft Nephropathy in Children with Kidney Transplantation
- 16:50-17:30 Closing Ceremony**
- 19:00-21:00 Congress Dinner**  
**Golbasi Patalya Resort Hotel**

## OPENING REMARK

### Historical Background of Pediatric Kidney and Liver Transplantation in Turkey

Mehmet Haberal, MD, FACS (Hon), FICS (Hon),  
FASA (Hon), FIMSA (Hon), Hon FRCS (Glasg)

*Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey*

The cornerstone events of kidney and liver transplantation history in Turkey are summarized herein.

Organ transplantation for children remains one of the most complex and challenging areas within current medical practice. The practice of transplant in the pediatric population has revolutionized the life of children with end-stage organ failure. Pediatric transplantation as a subspecialty is growing around the world with the establishment of new transplant programs and prioritization of organs for children.

In 1953, the first temporarily successful transplantation of a human kidney was performed by Jean Hamburger in Paris. A 16-year-old boy received the kidney of his mother as living donor transplantation. Then in 1954, a milestone was made with the first long-term successful kidney transplantation by Joseph Murray. Joseph Murray, a plastic surgeon, performed the first successful kidney transplant on the Herrick brothers, adult identical twins. In February 1967, 6-year-old Tommy Hoag became the first Children's Hospital Los Angeles (CHLA) patient to undergo a kidney transplant with a kidney donated by his father.

First attempt in solid-organ transplantation in Turkey began with two heart transplants in 1969. By the early 1970s, we started to conduct experimental studies on liver transplantation and on **November 3, 1975, we performed the first pediatric renal transplantation in Turkey, with a kidney donated from mother to her 12-year-old son.**

In an attempt to start a deceased-donor donation program in Turkey, I contacted and worked in cooperation with international networks, including first the Eurotransplant Foundation (Leiden, The Netherlands) and then, the South Eastern Organ Procurement Foundation (Richmond, Va, USA). Thus, **we were able to perform the first deceased-donor kidney transplantation, which was carried out at our center on October 10, 1978, using an organ supplied by the Eurotransplant Foundation.** Kidneys donated by these organizations were used with a high success rate even though they were anatomically problematic. Following these successful imported kidney transplants, **we increased the cold ischemia time from 12 hours to more than 100 hours.**

It became apparent that it would be necessary to have legislation to govern transplantation activities and, as a result of our efforts, the law on harvesting, storage, grafting, and transplantation of organs and tissues was enacted on **June 3, 1979 and later that year on July 27, 1979 we performed the first local deceased-donor kidney transplantation.**

We also worked with the Turkish public to provide education about the benefits of and social responsibilities involved in organ donation. In addition, we founded The Turkish Organ Transplantation and Burn Treatment Foundation in 1980 to advance these interests. Standardized "Organ Donation Cards" were printed as well, with the aim to promote donation and bring this concept to life in peoples' minds. On January 21, 1982 some new articles were added to Law 2238, with the enactment of Law 2594, which allowed for deceased donation without consent from next-of-kin. We started performing liver transplantations right after this.

In 1963, Thomas Starzl undertook the world's first human liver transplant. The recipient was a 3-year-old boy and the donor was another child. Unfortunately, the pediatric patient died intraoperatively. Four years later, in 1967, Starzl performed the first successful liver transplant, a 19-month old girl with hepatoblastoma who was able to survive for over 1 year.

This was followed by a period of many ground-breaking events; on December 8, 1988 we performed the first successful deceased liver transplant in Turkey and the region. In 1989, Raia and his associates reported the first two pediatric transplantations using grafts taken from living donors in Brasil, but both recipients died of medical complications. Following this, Dr. Broelsch and associates were able to perform living related liver transplantation in Chicago. At the same time, I started experimental studies on sheep. **This was followed by the first pediatric (one-year-old child) living-related segmental liver transplantation in Turkey, the Middle East, and Europe on March 15, 1990, and just one month later, we achieved success with the first adult living related liver transplantation (left lobe) in the world, after grafting tissue from a father to his 22-year-old son.**

**In addition, we conducted heterotopic liver transplantations. In 1998, we performed a heterotopic deceased-donor partial liver transplantation to a 17-year-old girl, heterotopic living-related transplantation to a 16-year-old boy and a heterotopic living-related liver transplantation to a 17-year-old boy from his mother in 1999. These were followed by other heterotopic liver transplantations either from deceased and living related donors in the following years.**

**On May 16, 1992, we performed the first combined liver-kidney transplantation from a living-related donor, which was the first operation of its kind anywhere in the world.**

In 2001, the Ministry of Health established the National Coordination Center as an umbrella organization to promote transplantation activities, especially for deceased donor organ procurement. Transplantation activities are accelerating day by day throughout the country, but deceased donors are still far below the desired rates. Efforts to increase awareness continue through the media, schools, and many public and private institutions. Improvements in legislation, education and coordination are key factors for increasing the quality and the quantity of transplantation activities in Turkey.

**Since 3 November 1975 until 1 January 2022, our team has performed 3288 kidney transplants (380 pediatric and 2908 adult patients), and since 1988, 701 liver transplants (334 pediatric and 367 adult patients). In over 40 years of kidney and liver transplantation history in Turkey, 46.876 (2.502 pediatric patients) kidney and 18.203 (2.612 pediatric patients) liver transplants have been performed nationwide.**

In conclusion, transplantation is currently the best option for children with chronic organ failure. Although pediatric organ transplantation is active in some parts of many developing countries, it is still inactive in many others and mostly relying on living donors. The lacking deceased programs in most of these countries is one of the main issues to be addressed to adequately respond to organ shortage. Still, pediatric kidney transplant outcomes are markedly improved and younger children today experience better long-term graft survival and anticipate even more advances in the future of pediatric kidney transplantation.

**L1****Challenges in Pediatric Kidney Transplantation: A Middle East Perspective****Faissal A. M. Shaheen**

*M.D. Facharzt (Austria), FSM (Neph), FRCP(UK), FACP(USA)*

*Head of Nephrology (DSFH),*

*Senior Consultant Physician and Nephrologist,*

*Past-President, International Society for Organ Donation and Procurement (ISODP)*

*Co-Chairman, WHO Task Force for Organ and Tissue Donation and Transplantation*

The global prevalence of Chronic Kidney Disease (CKD) in the pediatric population is 18 to 58 per million population (pmp). In the Middle East (ME), due to a lack of relevant registry, there is little data on this issue. In recent years, the annual number of pediatric kidney transplants performed in the ME countries has been 298 which constitutes a mere 9% of the total kidney transplants performed. Most of these transplants have been from living donors. In the Kingdom of Saudi Arabia, the number of pediatric transplants performed in 2017 constituted 0.5 pmp of which 7.1 were from deceased donors and 14.6 pmp were from living donors. The challenges unique to pediatric transplantation include the unique etiology of CKD in this population, delayed referral, associated co-morbid conditions, type of dialysis and need for technical expertise. The challenges post-transplant includes immunosuppression protocols, infection, growth, compliance and quality of life. The majority of pediatric CKD cases have unknown etiology (50%) which adds to the problem of post-transplant care. The common co-morbidities in children include poor nourishment, severe anemia and bone diseases and oxalosis. Dialysis facilities are limited in the ME and there is severe lack of technical expertise. In North America, children get priority for transplantation while such practice does not exist in the ME countries. There are major technical issues in pediatric transplantation including size disparity, vascular and ureteric anastomosis and need for specialized intensive care. The dose of immunosuppression needs to be adjusted, there are some serious infections that need to be tackled. The most serious problem is Epstein Barr Virus infection which has an incidence of 4 to 7.5%. The quality of life post-transplant is related to immunosuppressive drugs and non-adherence to drug intake. The reported non-compliance rates vary from 7 to 22%. In conclusion, pediatric transplant activities are limited by lack of deceased organ donation program. Many challenges are to be surpassed and more efforts are needed.



**L2****Pediatric Kidney Transplantation in the Middle East: Challenges and Solutions****Bassam Saeed MD, FRCP***Consultant Pediatric Transplant Nephrologist, Farah Association for Child with Kidney Disease**P.O. Box: 8292. Damascus – Syria**E-Mail: bmsaeed2000@yahoo.com*

Pediatric kidney transplantation (PKT) is the best option for treating children with end-stage renal disease (ESRD). The major challenge in the Middle East (ME) countries is to provide optimal treatment to children with ESRD. Poor economics, paucity of renal replacement therapy (RRT) and transplantation facilities in the government sector and high costs in private sector render majority of children disfranchised from RRT and transplantation.

Transplantation in the ME is shaped by the prevailing religious socioeconomic and health indicators. Living organ donation is the most widely practiced type of donation. However, some countries like Iran, Turkey, Kuwait, and Saudi Arabia already have their well-established deceased donation programs. Epidemiological information from the ME on the pediatric ESRD and PKT is very scant. Overall kidney transplantation rates are low in developing countries mainly due to economic and paucity of facilities. In children, rates are largely unknown and where reported are low, <0.1 per million child population (pmcp) in Pakistan and 4– 5 pmcp in Kuwait. Most reports are single center experiences except few multicenter reports. The kidney graft survival in some ME centers who published their data was 88-92% at one year, 67-89% at five years, and 50-83% at 10 years post-transplant. Most of these figures are quite comparable to western data. In developed countries PKT has become a routinely successful procedure where 1- and 5- year graft survival rates are 93% and 77% from deceased donors and 95% and 85% from living donors. Low health spending, poorly developed infrastructures, delayed referral of children with chronic kidney disease, com-morbidities, lacking technical expertise, inadequate pediatric dialysis programs, extended dialysis time, organ shortage, commercial transplantation, and post-transplant infections are the main pre and post-transplant challenges. The community-government partnership model has shown that pediatric RRT and transplantation can be successfully established in a developing country including many of ME countries. Society can be motivated to accept transplantation as the therapy of choice for ESRD provided the outcomes are good and it is available “free of cost” to all who need it

In this report we present an overview of PRT in ME countries. It highlights the challenges encountered and their solutions for establishing a successful and viable pediatric transplant program in low resource.

**Conclusion:** Although PKT is active in many parts of the ME, it is still inactive in others and mostly relying on living donors. The lacking deceased programs in most ME countries is a main issue to be addressed to adequately responding to the increasing demand for organs

**L3****Pediatric Kidney Transplantation in Kuwait**

**Mustafa Al-Mousawi, FRCS, MB, BS(Lon), LRCP, MRCS(Lon), FRCS(Glasg)**

*President, Kuwait Transplant Society*

*Consultant Surgeon and Chairman, Organ Transplant Center, Kuwait*

*Head, Kuwait Organ Procurement*

*Councilor (Middle East and Africa), The Transplantation Society (TTS)*

*Rumaitheya, B 5, Av. 53, H 24, Kuwait*

In Europe, rate of pediatric kidney transplantation reaches up to 13.5 per million population (pmp), however in so called developing countries rates reported are much lower, the usual excuse is low GDP/capita. Kuwait is a small country with high GDP and a population of 4.5 million.

The annual incidence of pediatric patients requiring renal replacement therapy (RRT) is estimated at 18 pmp but the number of kidney transplantation performed for pediatric patients, in the only transplant center, is about 5 patients only accounting for 5% of total kidney transplants and 1.1 pmp of Kuwait.

There are several reasons for low rate of pediatric transplantation in Kuwait:

1. The transplant program, since it was established in 1997, has been an adult program; and although pediatric transplantation is performed by same team, there is shortage of pediatric transplant surgeons and pediatric nephrologists to follow up patients in the immediate post-operative period.
2. Due to lack of specialized pediatric transplantation program, government often send children, especially small ones, abroad when a family donor is available.
3. Tow third of the population of Kuwait are expatriate foreign employees; majority come to work in Kuwait without their spouses and children.

The study stresses the need to increase pediatric transplantation in Kuwait organ transplant center by employing experienced staff in this subspecialty.

**L4****Pediatric Kidney Transplantation in Africa: 1 Case Report****G. Hakim, M. Abounader, N. Hakim****Prof Nadey Hakim, MD PhD Hon.D. Arts***President's Envoy, Imperial College**Vice President, British Red Cross, London**Chevalier de la Legion d'Honneur**Professor of Transplantation Surgery, Imperial College London**President, American College of Surgeons (UK Chapter)**Membre de l'Academie Francaise de Chirurgie*

Successful renal transplantation remains the optimal treatment for chronic kidney failure in paediatric patients with end-stage renal disease. It has been observed that outcomes in paediatric transplantation are nearly identical to those in adults due to improvements in surgical techniques and immunosuppressant application.

A 12-year-old patient presented with elevated blood pressure, creatinine levels 748  $\mu\text{mol/L}$ , urea 29.7  $\text{mmol/L}$ ,  $\text{K}^+$  5.2  $\text{mmol/L}$  and  $\text{Na}^+$  132  $\text{mmol/L}$ . A CT urography revealed minimal excretion from both kidneys and developed a subsequent need for haemodialysis. The patient was diagnosed with ESRD following chronic kidney disease. A significant deterioration in his condition followed and the patient underwent a living donor kidney transplant from his aunt on December 6<sup>th</sup>, 2020.

Immediately following transplantation, the urine output was adequate but decreased several hours post-op. An urgent Renal Doppler US was performed at bedside and revealed poor flows requiring a surgical re-exploration showing a compressed kidney which revived immediately which resulted in increased graft function and urine output. Creatinine levels improved consistently throughout his hospital stay and he was discharged 16 days later.

This case report shows how vital vigilance is in observing patients post-operatively. Where ultrasounds cannot be made available 24/7, exploration of the patient is necessary to salvage a precious kidney. Two years on, this patient's kidney function is perfect, and he remains under close observation.

**L5****Challenges and Opportunities in Pediatric Kidney Transplantation in Lower- and Middle-Income Countries (LMIC)****Mignon McCulloch<sup>1</sup>, Arpana Iyengar<sup>2</sup>**<sup>1</sup>*Red Cross War Memorial Children's Hospital, University of Cape Town, South Africa*<sup>2</sup>*St Johns Hospital Medical College Hospital, Bangalore, India*

**Introduction:** Paediatric organ transplantation is accepted standard of care for end stage organ failure but has significant challenges in LMIC which needs careful consideration

**Methods:** Review of issues that exist pertaining specifically to children receiving transplantation.

**Results:** These can be divided into organizational issues including cultural issues, government legislation including organ trafficking and paediatric organ allocation, differences in under resourced areas including donor and recipient issues such as tissue typing and immunosuppression availability. Medical issues of complications including long term outcomes and acute rejection also reviewed. Infections in LMIC are a significant challenge and reviewed in this paper with particular attention to EBV, TB and COVID-19 as well as vaccinations. Post-transplant medical issues including urological and recurrence of primary disease as well as specific paediatric challenges including family issues are also explored. Finally, adolescent specific transition problems is reviewed with some suggestions made. Sister centre training units and involvement of allied health practitioners are also discussed in addition to the success of on-line virtual teaching programs and interactive webinars which have developed in the Covid-19 era.

**Conclusion:** Transplantation in children in LMIC has significant challenges but solutions and opportunities are discussed in this paper.

Iyengar A, McCulloch MI. Paediatric kidney transplantation in under-resourced regions-a panoramic view. *Pediatr Nephrol.* 2021 Apr 10:1–11. doi: 10.1007/s00467-021-05070-3. Epub ahead of print. PMID: 33837847; PMCID: PMC8035609.

**L6****Donor Selection and Outcome for Pediatric Live Donation Kidney Transplantation****Gamal Saadi, MD**

*Professor of Internal Medicine and Nephrology, Cairo University*

*Consultant of Pediatric Kidney Transplantation Unit,*

*Abo El-Reesh Hospital, Cairo University*

*Cairo, Egypt*

Pre-emptive related live donation kidney transplantation carries the best outcome for pediatric ESKD. Donor age, sex and co-morbidities; considering marginal extended criteria donors; are to be considered in selecting the donors.

Kidney size and number of vessels; to match recipient weight and vasculature; are important parameters. Genetic screening is occasionally required according to recipient's primary disease.

Post-transplant, live related donation, follow up and assessment is mandatory to evaluate not only the clinical parameters, but as well the quality of life, social and psychological status.

One year follow up of 50 donors at Abo El-Reesh revealed no significant change in serum creatinine rather than GFR (albeit normal), an incidence of 16% of blood pressure elevation and a tendency of impaired glucose tolerance among females. There was a positive social and psychological impact.

Pre-transplant prompt donor selection is crucial, and post-transplant care and follow up is mandatory.



**L7****Updates on Post-Transplant Diabetes****Mohammad Ghnaimat, MD, FRCPE, FACP**

*President of Jordan Society of Nephrology and Renal Transplantation*

*Past President of Arab Society of Nephrology and Renal Transplantation*

*Member and Immediate Past Chair of ISN Middle East Board Region*

*President Elect of the MESOT*

*President of Jordan Society of Internal Medicine*

*President of Jordan Society of British Medical Graduates*

*Overseas Regional Advisor of the RCPE*

Solid organ transplantation (SOT) is a life-saving procedure and is an established treatment for patients with end-stage organ failure. However, medical complications following transplantation are quite common, of which post-transplant diabetes mellitus (PTDM) is one of the most important because of a well-known association with major complications like cardiovascular and infectious events.

PTDM develops in 8–25% of patients with kidney transplants and in 15–45% of patients who have undergone other SOT.

Major risk factors for development of PTDM are metabolic side effects of immunosuppressive medications, post-transplant viral infections and hypomagnesaemia, in addition to the traditional risk factors seen in patients with type 2 diabetes mellitus.

Prevention of PTDM can be achieved by modifying the dose of immunosuppressant and probably also by lifestyle intervention, However, most patients with PTDM eventually need to be treated with hypoglycemic agents that have been tested for efficacy and safety regarding drug–drug interactions with immunosuppressant drugs and organ function.

In this review I will present the current and most updated knowledge on PTDM, including clinical evolution, reversibility rate, diagnostic criteria, risk factors, pre-transplant metabolic syndrome and insulin resistance and the interaction between these factors and immunosuppressive drugs.

Finally, I will also discuss the current evidence on PTDM treatment.

**L8****New Immunosuppressive Strategies to Achieve Better Compliance and Results****Mohamed Hani Hafez***Professor of Nephrology and Medicine**Cairo University, Cairo, Egypt**President Elect, African Association of Nephrology (AFRAN)**Secretary, Middle East Society for Organ Transplantation (MESOT)*

The problem of decreased compliance to transplant medications is prominent in pediatric and adolescent kidney transplantation. A meta-analysis of medical regimen adherence in pediatric solid organ transplantation found that non-adherence to clinic appointments and tests was most prevalent, at 12.9 cases per 100 patients per year (PPY), followed by non-adherence to immunosuppression at 6 cases/100 PPY.

According to Sellares et al (AJT,2012) ABMR (50%) and Glomerulonephritis including recurrence (18%) were the prominent histological diagnoses in up to 5000 days follow up post-transplant .47% of ABMR was attributed to non-adherence. the overall graft failure rate due to recurrent disease is about 7 percent. Among the glomerular diseases that may recur in the graft, the most frequent is focal segmental glomerular sclerosis ((NAPRTCS database). Even if compliant patient many factors can influence inter and intra-patient variability of tacrolimus exposure for example.

Could we shift to other options including injectable immunosuppressive, could we wait for new drugs in the pipeline to be released?

Conversion Strategies from classic tacrolimus to long acting preparations could help. Shift from CNIs to mTOR inhibitors was shown either de novo in TRANSFORM study, or later in Apollo trial. Co-Stimulation Blockade with intermittent injections Could Replace CNIs specially in some Attractive Indications for Belatacept TMA - Recurrence of FSGS , and in low levels of DSA Ullao et al (Transpl 2019).

There are several immunosuppressives in the pipeline. However, to be ideal the future one should have at least comparable results to current IS, Short and long term benefits, more compliance, Better GFR, Less CAN, Less cardiovascular risk, Less diabetes, less infection, less malignancy, studied in pediatric and adolescent age groups and Less expensive.

Co-stimulation Blockade by anti-CD28 and Anti-CD-40 monoclonal antibodies, Proteasome inhibitors, Anti-CD20 monoclonal antibodies, IDES, C1 esterase inhibitors, Belimumab, and Interleukin-6 inhibitors have been all studied. In particular, Anti-IL-6 wide use in COVID-19 patients is reassuring regarding safety.

Every graft counts much because there is discrepancy between demand and supply of organs.

**L9****Cardiac Death Donation****Hassan Argani, MD**

*Professor of Nephrology,*

*Shahid Beheshti University of Medical Sciences, Tehran, Iran*

*Vice President, Middle East Society of Organ Transplantation (MESOT)*

Increased suitable solid organs for transplantation is very interesting issue for both patients and physicians. It should be supported by ethical and innovative approaches this incremental needs for supplying of transplanted organs.

Solid organ harvested after cardiac death (CD) is one approach to undertake increased numbers of available organs. Many challenges in the practice for CD donors include “how to identify patients as suitable potential CD donors”, “how to support and maintain the trust of mournful families”, and “how to manage the warm ischemia time that should be acceptable professionally, ethically, and legally.”

The source of potential donors for CD could be divided to the “controlled” or “uncontrolled” groups.

In the first group the patient (or first degree relative family) decides to forgo of life supporting care. After resolving of the ethical issue it is allowed that the patients to become an organ donor and to permit the needed solid organs be removed promptly.

In the second group organ is recruited from the death patient as a result of catastrophic injury usually out of hospital. In such cases organization is inferior to the first group. The estimated percentage of potential uncontrolled CD donors was estimated about 4.2% to 19.4% of all of the out of hospital cardiac arrest cases. It means almost 14.3 to 65.4 donors per million populations per year (pmp/year).

Many ethical concerns exist with CD donation; including declaration of death and withdrawal of life support for a patient whose organs are to be retrieved for transplantation. This critical decision needs a separated and full educated team.

Participating physicians for retrieving solid organs should observe the following protocols for harvesting the solid organs from the CD donors:

To diagnose and identify any suitable potential donor candidate for CDC. It is very important to observe and adhere the CD policy in each center and ensure that the decision to withdraw life-sustaining treatment is made prior to and independent of any offer of opportunity to donate organs.

Obtained informed consent for organ donation is mandatory from the first relative family members, similar in the case of brain death (BD) donors.

In the last, ensure that relevant standards for good clinical practice and palliative care are followed when implementing the decision to withdraw a life-sustaining intervention.

**L10****Scientific Publishing Under COVID Stress: Can We Make It More Useful?****Jeremy R. Chapman***Clinical Professor of Medicine, The University of Sydney**Editor in Chief, Transplantation Journals*

The COVID-19 pandemic has exposed many weaknesses in our preparedness for a virus pandemic. Amongst these problems, 2020 exposed the difficulty in getting properly evaluated good research answers to the community through the conventional scientific publishing system.

In Feb and March 2020 the world knew far too little about SAR-CoV-2 and there was a great hunger for knowledge about the clinical course and treatments. Verbal communication between individuals with early experience of infected patients and unreliable general media distorted by the political message imposed by governments, seemingly determined to downplay the epidemic, replaced actual data.

In the early part of 2020 conventional submission and publishing cycles were accelerated by use of professional society websites, pre-print servers, social media and other non-peer reviewed mechanisms for spreading information. Much of the early material in transplantation was unreliable with poorly developed science, such as reliance on homemade and unvalidated pathology tests. This was compounded by study of small cohorts and conclusions extrapolated beyond the data. The publishing cycle was then too slow – on average 21-28 days for peer review and initial decision, then up to 4 weeks back with the authors for revision, followed by another 10 days for a decision on the revision, 10 days to get author signatures and manage the mechanics of sending a paper to production before weeks or months for an author corrected typeset proof online in a journal. Assignment to a weekly or monthly issue of course then delayed a final ‘printed’ version, such that six months from first collecting data to publication, would not be unexpected. Clearly unacceptable in the face of the rolling pandemic and urgent need for information.

At the end of 2021 Transplantation received a paper on a national study of more than 40,000 transplant patients describing the effectiveness of two vaccines to prevent SAR-CoV-2 infection and mortality. It was peer reviewed, revised, accepted and put online as an author corrected final version on the journal website in 21 days, over the Christmas holiday and new year period. Science and scientific publishing must learn the lessons of this pandemic if we are to be better next time.

**L11****COVID-19 Vaccination in Children with Solid Organ Transplant: Critical Appraisal****Antoine Barbari, MD***President, Middle East Society of Organ Transplantation**Professor of Medicine, Lebanese Faculty of Medical Sciences**Director, Renal Transplant Unit, Rafik Hariri University Hospital**Nephrology Senior Consultant, Clemenceau Medical Center**Bir Hassan, Beirut-Lebanon*

Children and immunocompromised pediatric patients have been excluded from most the COVID-19 vaccines trials. None of the recently rolled out vaccines has been rigorously tested in solid-organ transplant recipient (SOTR). Consequently, Short and long-term clinical efficacy, immunogenicity, time span of immune protection and safety data on COVID-19 vaccines are currently lacking. Early cardiovascular and neurological adverse events including risk of death are increasingly acknowledged. Adolescent with chronic kidney disease and SOTR have antibody titers and seroconversion rates after vaccination higher than that in adult transplant patients, but considerably lower compared with vaccine response in healthy controls. Most of adult kidney transplants recipients with previous SARS-CoV-2 infection seroconvert post-vaccination and their T cell responses are similar to those in healthy individuals. Immunocompetent children with primary SARS-CoV-2 infection generate robust, cross-reactive and sustained immune responses to SARS-CoV-2 with focused specificity for the spike protein. Interestingly, spike-specific T cell responses are also detected similarly in a sizable proportion of seronegative adults and children. Risk factors for poor vaccine immunogenicity include older age, shorter time from transplantation, use of mycophenolate, and worse allograft function. In the absence of any well-defined correlate of humoral or cellular immunity, the assessment of immunogenicity of COVID-19 vaccines is highly controversial and remains an important challenge in SOTR. Clinical markers and immune cutoffs for protection from severe COVID-19 are currently unknown regardless of age. Most of the current recommendations in this selected population are based on expert opinion from limited single center observational data, retrospective analysis or extrapolation from studies in the adult population. This appraisal highlights the current paucity of data in pediatric SOTR and stresses the need for future well-designed trials to characterize COVID-19 vaccine safety, immunogenicity, and efficacy in this patients's population.



**L12****Covid-19 and Allograft Rejection****Professor Marwan Masri, PhD Medical Immunopathology***President Mediterranean Transplant Network (MTN)**CEO, Transmedical For Life Canada and Lebanon*[www.tmforlife.com](http://www.tmforlife.com)

Although The immune system that is activated in response to the insult by covid-19 infection and to a transplanted organ is the same, however, the response and the outcome differ. SARS-CoV-2 is primarily a respiratory tract infection, is associated with hypercoagulability, or increased tendency for the blood to clot. In a healthy individual with a competent immune system the virus infects type-II pneumocytes of both the upper and lower respiratory tract cells utilizing the spike protein to bind to the ACE2 receptor on the host cells to penetrate the cells. Following replication inside the cell the virus infects other healthy cells leading to an augmented immunological insult to the body. A rise in the number of virus cause damage or death to the host cell leading to release of damage-associated molecular patterns (DAMPs). These DAMPs can initiate and perpetuate a non-infectious inflammatory response by interacting with pattern recognition receptors (PRRs). The lung epithelial cells, endothelial cells, and alveolar macrophages, have receptors for the DAMPs which upon recognition causes the production by these cells of pro-inflammatory cytokines and chemokines which is responsible for many of the clinical events associated with the virus. On the positive side, the viral DAMPs, cause the release of type I interferon which acts as a fed back mechanism to inhibit virus replication. In at least 10 to 15 % of Covid infection there is a delayed IFN-I production which may lead to further recruitment of inflammatory cells such as monocytes, macrophages, and neutrophils which secrete pro-inflammatory cytokines causing what is known as cytokine storm that damage the lung alveoli leading to severe acute respiratory syndrome as well as multiple organ failure. Currently the serum inflammatory marker C-reactive protein and D-dimer, are be utilized as biomarkers for the prognosis of Covid-19. The influx of the pro inflammatory cytokines effects cellular arm of the immune system by down regulation of T-cell associated markers, CD4, CD8. The decrease in CD4 positive and CD8 positive cells allows more opportunistic infection to overwhelm the immune system leading to an increase in morbidity and mortality. In a transplanted patient who is immune compromised infection with SARS-CoV-2 initiates a cascade of events that potentiating the effect of immunosuppressive drugs which in turn lead to progression to a severe disease. The first step of the immune system cascade, leading to graft rejection, is recognition. Recognition is followed by the ligation of a series of adhesion molecules starting with an antigen to its specific T-cell receptor (TCR) cluster of differentiation (CD) complex, expressed on the surface of the T cell. In order for the activation to proceed additional costimulatory signals, such as ligation of the CD28/B7, CD4/HLA class II and CD/HLA class I antigens are required. During the activation process, the lymphocyte, begins to acquire new CD molecules such as CD25 (IL-2R), CD69, CD71 and HLA-DR. This is accompanied by an increase of cytokines production by the primed T cell. The cytokines are essential for the differentiation, proliferation and amplification of the T-cell The most important of these cytokines is interleukin (IL)- 2, which is essential for activated T-cell proliferation. With the use of immunosuppressant drugs, the virus escapes the compromised immune system and increase its replication leading to a higher viral load and further increase the transition to a severe disease. Although it is contraindicated cessation of immunotherapy can in theory prevent a further health deterioration however the risk of graft rejection increase. The best effect regiment till now is to temporally reduce/stop CNIs and MMF and increase steroid for anti-inflammatory and convert to mTORis-based immunosuppressive therapy.

**L13****Outcomes of SARS-CoV-2 Among Pediatric Waitlisted and Kidney Transplant Recipients: A Single-Center, Observational Study from India**

Vivek Kute, Sanshriti Chauhan, Subho Banerjee, Ruchir Dave, Vineet Mishra, Hari Shankar Meshram

*Department of Nephrology and Transplantation, IKDRC-ITS, Civil hospital Campus, Ahmedabad, Gujarat, India*

**Introduction:** Coronavirus disease has impacted all age groups, but reports among pediatric solid organ transplantation is definitely lacking from the Indian subcontinent which was gravely hit during second wave of the pandemic with the delta variant.

**Materials and Methods:** We performed a single-center, retrospective analysis of pediatric waitlisted and kidney transplant recipients (KTR) who had confirmed COVID-19 infection. The clinical profile, outcomes, and follow-up were explored.

**Results:** We report 22 pediatric patients [ waitlisted(n=11) and KTR (n=11)] with COVID-19. The median (IQR) age for waitlisted and KTR was 11(8.5-15.5) and 14(12-15.5) years respectively. The cohort comprised of male gender (72.7%) predominantly in both groups. The duration from initiation of renal replacement therapy in waitlisted to COVID-19 was (12.9-15.5) months and 15(12-20.5) months for waitlisted and KTR respectively. COVID-19 severity for waitlisted and KT ranged from mild, moderate, and severe in 7,3 and 1 and 8,2 and 1 for waitlisted and KTR respectively. One case of multisystem inflammatory syndrome among the waitlisted group was reported in the whole cohort. One mortality was reported in the waitlisted group. patient with secondary sepsis. Patient and graft survival was 100 % for the KTT. The median follow-up for waitlisted and KT in the cohort was 6(4.5-6) and 5(4-6) months respectively.

**Conclusion:** In our preliminary report, interrogating the COVID-19 spectrum among Indian ethnic pediatric waitlisted and kidney transplant recipients, the outcome was reported to be dormant. A larger cohort study and registries are further required to confirm our findings.

**Keywords:** Renal transplant, dialysis, MISC, SARS-CoV-2

**L14****The Largest Single-Center Report on Pediatric Liver Transplantation**

Seyed Ali Malekhosseini\*, Saman Nikeghbalian, Kourosh Kazemi, Peyman Arasteh, Alireza Shamsaeefar, Hamed Nikoupour, Masood Dehghani, Mohammad Bagher Khosravi  
*Shiraz Transplant Center, Abu Ali Sina Hospital, Shiraz University of Medical Sciences, Shiraz, Iran.*

**Background:** By improvements in surgical techniques, postoperative care, and immunosuppressive drugs, liver transplantation (LT) has become the standard therapy for infants and children with end-stage liver disease. Pediatric patients stand for about 12.5% of all liver transplant recipients. Reports on pediatric LT are highly variable according to geographical region. Moreover aside to some sparse studies, reports from the Middle-east are scarce.

**Objective:** We report the clinicopathological characteristics on pediatric liver transplantation from one of the largest LT centers in the world.

**Methods:** A total of 1141 pediatric patients with LT are included in this report. Data on baseline characteristics, anthropometric indices, clinical and pathological characteristics, laboratory data and prognosis are reported.

**Results:** The mean age of our patients was  $7.83 \pm 5.55$  years old. Overall, 9.2% of patients were neonates and majority of patients were older than 5 years old (57.1%). A total of 40.5% of the grafts were from living donors, the rest were from deceased donors. The most common etiology for LT in the pediatric population was biliary atresia (15.9%), progressive familial intrahepatic cholestasis (13.4%), Wilson's disease (13.3%) and cryptogenic causes (9.6%).

Most MELD scores were between 15 and 29 (61.8%). Most common type of organs used were whole organs and living organs (47.9% and 41%, respectively). The most common in-hospital complications included infections (26.8%), bleeding (23.4%), and vascular complications (18%) and the most common causes of death were sepsis (35.2%), followed by post-transplantation lymphoproliferative diseases (10.5%), and primary nonfunction of liver (9%).

The one-year, five-year, ten-year and fifteen-year survival in our population was 83%, 73.5%, 72.1%, and 71.7%, respectively.

Regarding donor specifics, mean donor age was  $22.15 \pm 12.67$  years old and the cause of death included trauma (58.5%), cerebrovascular events (15.1%), cancers (6.2%), and seizures (5%).

**Conclusions:** Our report provides invaluable information and experiences on baseline and clinicopathology of pediatric LT and is the largest single-center report on pediatric liver transplantation in the world.

**Keywords:** Liver; Transplantation; Pediatric; Survival

**L15**

...

**Professor Refaat Kamel**

*Chair, Department of Surgery Ain Shams University (ASU)*

*Chairman of Hepatobiliary Pancreatic Surgery (ASU)*

*Immediate Past-President, Middle East Society of Organ Transplantation (MESOT)*

Abstract not available.

**L16****Orthotopic Liver Transplantation in Children: Tools for Long-Term Follow-Up****Ignazio R. Marino, MD, ScD, FACS***Professor of Surgery, Sidney Kimmel Medical College, Thomas Jefferson University**Executive Vice President for Jefferson International Innovative Strategic Ventures**Thomas Jefferson University and Jefferson Health**Executive Director, Jefferson Italy Center**Philadelphia, PA 19107, USA*

Liver transplantation is a life-saving therapeutic procedure for children with untreatable end-stage liver diseases. The number of children on a long-term follow-up is increasing worldwide. There are several issues to be followed because the quality of life depends not only on the physical function but also on the patient's psychological welfare and social insertion. Detection of late surgical complications, the potential recurrence of the disease, and chronic rejection are post-transplant drawbacks. Immunosuppressive weaning is advisable to avoid side effects such as delayed growth, diabetes, hypertension, and renal dysfunction. Obesity and cardiovascular disease are emerging post-transplant problems the transplant community will deal with. PTLD and other malignancies (i.e., skin cancer) are peculiar to this group of patients, and specific care should be paid in avoiding EBV infection. Vaccinations are gaining importance, especially in the Covid-19 era, but there are many community-acquired respiratory viruses to be avoided, especially respiratory syncytial virus.

Inclusion of anti-lymphocyte or anti-interleukin-2 antibodies in the induction phase of immunosuppression allows earlier weaning from corticosteroids and lower maintenance levels of calcineurin inhibitors. Still, there should be a role for alternatives such as renal-sparing immunosuppressive agents. Calcium channel blockers and other antihypertensive agents effectively treat hypertension and preserve renal function during calcineurin-based immunosuppression. Physicians should administer long-term growth hormone treatment in children who do not manifest catch-up growth after liver transplantation. Histologic abnormalities in the graft of clinically silent patients should be carefully followed-up.

On the other hand, adolescent issues are strictly connected to risk behavior. Counseling should be given about substance abuse, smoking, alcohol, and contraception. According to developmental maturity, transition to adult care is a multidisciplinary process and should gradually begin around 10 to 11 years. The patient should develop self-management and advocacy skills, take responsibility for medication and appointments, engage with care providers or seek care if needed. Safe living should be advised to minimize post-transplant risks (food, water, animals, and travel). Sports and recreation should be encouraged to improve physical activity. Tattoos and piercings are acceptable if the child has received the hepatitis B vaccine. Last but not least, attention must be paid to psychological issues such as familiar environment, adherence/non-compliance, cognitive function, and quality of life. Psychological, neurological, nutritional, and family follow-up is recommended.



**L17****Expanding the Pediatric Liver Donor Pool without Compromising the Adult Liver Pool. Split Liver Transplantation; Technical Considerations****Hassan Yersiz, MD***Professor of Surgery**Director, Organ Procurement**UCLA Health School of Medicine, Los Angeles, CA, USA*

**Objective:** To examine the techniques of split liver transplantation to achieve the expansion of the pediatric liver pool. **Technique:** Split liver transplantation can be performed ex-vivo or in-situ using the conventional (left lateral segment [LLS] and right trisegment [RTS] technique to add extra pediatric grafts to cadaveric donor pool. Each has its own set of advantages and disadvantages. Ex-vivo splitting does not require extra deceased donor operating room time and results in acceptable patient and graft survival. However, it involves inadvertent graft re-warming, biliary complications, bleeding from the liver's cut surface, and poorer outcomes in critically ill patients.

In-situ splitting allows rapid identification of biliary and vascular structures, hemostasis during the parenchymal transection, and less warm and cold ischemia time. It also can facilitate graft sharing among transplant centers. Disadvantages include longer donor operating room time, the need for a stable donor, and the need for a skilled procurement team at the donor hospital.

**Current Status:** Currently less than %3 of the cadaveric liver grafts is split in the US. The trend towards in-situ splitting continues and the procedure of reduction of the liver decreased dramatically in recent years.

**Conclusions:** Whether performed ex-vivo or in-situ, split liver transplantation is a challenging operation that requires meticulous patient selection and meticulous surgical technique. Split liver grafts exhibit outcomes similar to cadaveric whole organs with only a slightly higher rate of complications. Split liver transplantation offers immediate expansion of the donor pool, and its routine use may decrease the dependency on living donation, thus overcoming the concerns of living donor safety.

**L18****Pediatric Combined Liver and Kidney Transplantation: A Single Center Experience****Fatima Fadel, MD**

*Professor of Pediatric Nephrology, Cairo University, Egypt.*

*Head of Pediatric Kidney Transplantation Unit,*

*Abo El-Reesh Hospital, Cairo University*

Pediatric combined liver and kidney transplantation (CLKT) is a challenging practice for a high risk category of patients with multiple co-morbidities.

It is the best; if not the only; definitive solution for children with end stage kidney disease (ESKD) having additional functional and / or metabolic hepatic disorder. We report the outcome of CLKT in a cohort of 9 children from 2009 to 2019; 2 girls and 7 boys; with Type 1 Primary Hyperoxaluria (PH1).

Three patients died prior to surgery on waiting list. Mean age at transplant was  $8.2 \pm 4$  years. Confirmatory genotyping was performed to 4 out of the 6 cases. The first attempt was planned for consecutive CLKT, and despite initial successful liver transplant, the girl died of biliary peritonitis prior to scheduled renal transplant. Of the 5 who underwent simultaneous CLKT, three survived and are well, two with insignificant complications, and the third suffered from abdominal Burkitt lymphoma managed by excision and resection anastomosis, four cycles of rituximab, cyclophosphamide, vincristine, and prednisone. The other two died, one due to uncontrollable bleeding within 36 hours of procedure, while the other died awaiting renal transplant after loss of renal graft to recurrent renal oxalosis 6 months post-transplant.

CLKT represents the best chance for children suffering from PH1 with ESKD. Organ shortage and frequent complications; including recurrence; with 60% survival represents a challenging experience.

## 01

## Launching Pediatric Kidney Transplant Program in “Okhmatdyt”: First Steps, Current Issues, Perspective

**Oleg Godik<sup>1,2</sup>, Daria Diehtiarova<sup>1,2</sup>, Vasyly Nedbala<sup>1</sup>, Olga Babicheva<sup>1</sup>, Viktoria Apalkova<sup>1</sup>, Serhii Vodianytskyi<sup>1</sup>, Yevhen Grogul<sup>1</sup>, Volodymyr Zhovnir<sup>1</sup>**

<sup>1</sup>National Specialized Children's Hospital “Okhmatdyt”, <sup>2</sup>O.O. Bohomolets National Medical University, Kyiv, Ukraine

**Aim:** Pediatric patients with end-stage kidney disease (ESKD) require transplant as a treatment option that provides not only the survival but the appropriate quality of life. Since the Law on Transplantation was changed in Ukraine, it ensured the transplant-connected health services to be performed under a statutory procedure. Kidney transplant program was launched in the main pediatric clinic of Ukraine. Here, we aimed to represent and analyze 15 kidney transplants (KTs) performed in “Okhmatdyt” between March and December 2021

**Materials and Methods:** We evaluated 15 kidney transplants (KTs) performed in “Okhmatdyt” between March and December 2021. 10 genes HLA-typing was performed to all our potential recipients, and HLA-database was created to save time in following HLA-matching. Our laboratory also performed all pre-transplant cross match tests. Short-term preparation within 1 month took place in 2 kids after ESKD diagnosis was established, both had parents as donors.

**Results:** 15 children (4 males and 11 females, diagnosed kidney disease at the mean age of 7.9±1 years) underwent KT in our clinic at the mean age of 11.5±3.4 years, range 6÷17 years. ESKD in recipients resulted from congenital anomalies (n=6; 40%), kidney dysplasia (n=4; 26.7%), glomerulonephritis (n=2; 13.3%), acute kidney injury (n=2; 13.3%), nephrolithiasis (n=1; 6.7%). Median pre-transplant peritoneal or hemodialysis duration was 12 months (range 1÷52). We performed 6 (40%) living donor kidney transplants (LDKT), mean related (n=6) donors age was 40,1±3,2 years. The rest 9 (60%) were deceased donor kidney transplants (DDKT), mean deceased (n=7) donors age was 38,1±3,2 years, with no significant difference in age (p>0.05). Our clinic received both diseased kidneys in two cases. 1 transplant was urgent for dialysate diffusion into pleural cavities. 1 was a repeat transplant in seven months after first set-graft failure. Median post-transplant hospital stay was 15 days range 11÷65. The longer stay was connected to delayed renal graft function and rejection episodes (n=2). Graft survival is 93.3%, (n=14), one renal graft was removed for acute rejection and graft rupture. Recipients survival is 93.3%, (n=14), one 12 y/o female died of sepsis and COVID-9 complications in 2.5 months after LDKT. The mean follow-up period is 4.6±0.6 months. Rejection episodes were registered in 3 (20%) children, medication intake deflection, for social reasons in 2 cases. All were successfully treated by solumedrol pull-therapy. Pediatric recipients transplanted elsewhere are followed-up in our clinic. Now there are 5 males, mean aged 11.2±2.6 years. 3 of them underwent nephrectomy of non-functioning kidney grafts, 2 were transplanted low-weighted, not exceeding 10 kg (graft survival ranged from 1 to 4 years), one is suffering from recurrent urorenal infections and anemia, and one is being treated from rejection episode.

**Conclusion:** The variety of ESKD causes in children results into the need of KT for pediatric population on regular basis. It is crucial to perform solid organ transplants within a multi-specialty hospital with perfect laboratory support. It is crucial to communicate within a family of transplant centers to avoid graft losses, in most cases caused by the lack of information and cooperation. It is crucial to have support from those with greater experience, to avoid all possible underlying potential problems.

**O2****The Comprehensive Program on Renal Transplant for Children in National Mother and Child Science Center****Isakov Samat***University Medical Center, Nursultan, Kazakhstan*

**Aim:** To analyze clinical experience of renal transplantation for 101 children with chronic renal failure since the beginning of a comprehensive program on kidney transplant for children with ESRD in National Mother and Child Science Center.

**Materials and Methods:** Kidney transplant was performed for total 101 children aged between 3 and 18 from 2012 to May 2021 (45 (44.5%) of them are girls and 56 (55.5%) of them are boys. Age average of children is 10.2). In general, renal diseases causing ESRD are as follows: Congenital anomalies of kidneys and urinary tracts in 43 children (42.6%), glomerular diseases in 35 children (35.6%) and cystic diseases of kidney in 22 children (21.8%). For 70 children (69.3%), kidney was obtained from a living related donor with laparoscopic method while cadaveric renal transplant was performed for 31 children (30.7%). Renal replacement therapies were started with peritoneal dialysis for 54 children (53.5%) and with hemodialysis for 27 children (26.8%); kidney transplant was performed without starting dialysis for 20 children (19.7%). Kidney transplant was performed with midline laparotomy for children with bodyweight of 10 to 15 kg and donor kidney was placed to right iliac fossa in abdominal cavity. Vascular anastomosis was made between renal artery and aorta, vessels and inferior vena cava, respectively. Transplantation was performed by forming a locus for donor kidney with extra peritoneal hokey stick incision for children whose body weight are over 15 kg. “End-to-end” vascular anastomosis was made between iliac vessels. Results: Mortality rate is significantly lower and quality of life is remarkably higher in children with ESRD who undergo renal transplant comparing to children receiving hemodialysis (HD) or peritoneal analysis (PD). Comprehensive program on renal transplant for children with chronic renal failure (CRF) was started in 2012. 1-year survival rate of recipients has been calculated as 95.7% / 92.7%, 3-year survival rate is 93.0% / 90.5% and 5-year survival rate is 88.6% / 84.5%. Graft loss – 11 (10.8%), reasons: Rejection – 6, rejecting use of drug – 3, vascular thrombosis – 1, chronic nephropathy – 1. Mortality rate – 6 (5.9%). Causes: Cardiovascular diseases – 3, infections – 1, pulmonary edema – 1, intestinal obstruction –

**Conclusion:** Kidney transplant is the most effective treatment method for children with ESRD. While evaluating our kidney transplant experiences on 101 pediatric patients, we believe that the efforts spent to implement this program have produced successful results. Moreover, it has been noted that there are some problems which should be solved in the future; rate of cadaveric kidney transplant should be increased and a regulation is necessary for the regulation clearly defining the reasons in deceased organ donation system to be used for children with ESRD who need renal transplant.

## 03

## The Features of Kidney Transplantation with Congenital Anomalies of the Urinary Tract Development (A Practice Case)

A. M. Khadjibaev<sup>1</sup>, F. A. Khadjibaev<sup>1</sup>, P. K. Sultanov<sup>2</sup>, D. N. Ergashev<sup>2</sup>, A. A. Ismatov<sup>2</sup>

<sup>1</sup>Republican Research Center of Emergency Medicine, Department of General Surgery, Republic of Uzbekistan

<sup>2</sup>Republican Research Center of Emergency Medicine, Department of Transplantology, Republic of Uzbekistan

**Introduction:** The most common causes of hydronephrosis in newborns and children is vesicourethral reflux (VUR), which leads to an expansion of the collecting system of the urinary tract and the development of chronic renal failure.

**Case:** A 14-year-old girl presented with Chronic Kidney Disease (CKD), which was diagnosed at the age of 7 when back pain appeared. Diagnosed with ICD with an inflammatory process. At the age of 13, the patient was diagnosed with stage 5 of CKD and was prescribed programmed hemodialysis, which she received for a year. During examinations on MSCT, signs of bilateral urethrohydronephrotic transformation were revealed: on the right, a block in n / 3 of the ureter: the ureter is lengthened, curved, expanded to 15.7 mm, at the level of n / 3 it is visualized, a conical narrowing reaching the entrance to the bladder, on the left is a block in The pelvico-ureteric segment. Diagnostic cystoscopy revealed VUR on both sides: the mouth of both ureters does not close completely, the diameter of the right ureter is up to 1.5 cm, and the diameter of the left is up to 1.7 cm. The donor was the mother of the patient, U.G. born in 1982. HLA compatibility showed HLA-A, B and DR matches - one match each. Cross match - 4%. The patient underwent heterotopic kidney transplantation into the right iliac region with the imposition of an end-to-end anastomosis between the kidney artery and the internal iliac artery, as well as the renal vein with the external iliac vein as an "end-to-side" one. Uretero-vesical anastomosis was applied according to the standard Leach-Gregoire procedure with JJ stenting. The next step was the duplication of the wall of the right ureter on the spinning with the imposition of urethrocystoneoanastomosis on the right with JJ stenting and the imposition of urethrocystoneoanastomosis on the left with JJ stenting. Immediate graft function was observed during the operation. The recipient received standard three-way immunosuppressive therapy. The daily urine output was 5400 ml, which gradually decreased to 3200 ml on the 9th day after the operation. The creatinine level decreased from 0.40 mmol / L to 0.066 mmol / L on the 9th postoperative day. The creatinine level decreased from 0.40 mmol / L to 0.066 mmol / L on the 9th postoperative day. There was a moderate proteinuria of 0.066 g / L on the 2nd day and 0.198 g / L on the 4th day after surgery. The absence of proteinuria was observed only on the 5th day after surgery. Ultrasound of native kidneys on the 17th day after surgery on the right: size 7.3x2.5 cm, contours are even, clear; respiratory mobility is preserved; the thickness of the renal parenchyma (TRP) 0.4-0.6 cm; Pyelocaliceal system (PCS) is not expanded; the pelvis is not dilated, the ureter is not visualized. Left: the size of the kidney is 6.3x2.4 cm; respiratory mobility is preserved; TRP 0.3-0.4 cm; PCS is not dilated, cups are not defined; the pelvis is not dilated, the ureter is not defined in the upper third. The patient had ureteral stents removed on the 27th day after the operation. Ultrasound of the transplanted kidney on the 7th day: the contours of the kidney are even, clear, dimensions 10.2x4.6 cm; TRP-1.4-1.5cm; pyramidal pattern is not pronounced; PCS are not expanded; the pelvis is not dilated; blood flow in arcuate arteries - Max V - 28.7 cm / sec, RI-0.61; in segmental arteries - Max V - 50.6 cm / sec, RI-0.65; on the anastomosis: Max V - 120.4 cm / sec, RI-0.72; Conclusion: Doppler ultrasound indices of the transplanted kidney are within normal limits.

**Conclusions:** Kidney transplantation for children has shown good results in surgical transplantation. Early diagnosis and timely treatment of congenital malformations of the urinary tract in children can reduce the incidence of CKD in children and its transition to the terminal stage.

**O4****Prognostic Significance of the Simultaneous Vascular Rejection in Pediatric Patients with Antibody-Mediated Rejection (AMR) in Renal Allografts**

**B. Handan Özdemir<sup>1</sup>, Eda Yılmaz Akçay<sup>1</sup>, Esra Baskın<sup>2</sup>, F. Nurhan Özdemir<sup>3</sup>, Mehmet Haberal<sup>4</sup>**

<sup>1</sup>Baskent University Faculty of Medicine, Department of Pathology, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

<sup>3</sup>Baskent University Faculty of Medicine, Department of Nephrology, Ankara, Turkey

<sup>4</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

**Introduction:** The prognostic significance of simultaneous vascular rejection (VR) and AMR on graft survival is not clear enough, especially in the pediatric population. Accordingly, we aimed to determine the impact of simultaneous VR and AMR on the development of transplant glomerulopathy (TG) and interstitial fibrosis (IF) with the resulting graft survival.

**Methods:** Forty-five recipients younger than 18 were separated into Group 1 patients (n:25) with pure AMR and Group 2 patients (n:20) with simultaneous VR+AMR. Tubular expression of TNF- $\alpha$ , TGF- $\beta$ , and HLA-DR was evaluated. Peritubular capillary (PTC) and interstitial leukocytes were highlighted with TNF- $\alpha$ , HLA-DR, and CD68. The loss of HLA-DR expression on PTCs was studied to determine the PTC destruction. Diffuse IF and TG development were analyzed in the follow-up biopsies.

**Results:** The response of Group 2 patients to rejection therapy was lower than Group 1 ( $p < 0.001$ ). PTC C4d expression was found higher in Group 2 than Group 1 ( $P < 0.001$ ).

Group 2 showed a higher PTC destruction, IF, and TG incidence than Group 1 ( $P < 0.01$ ). The development of IF and TG increases with the increasing degree of glomerulitis, C4d expression, and PTC destruction ( $p < 0.01$ ). Tubular and interstitial TNF- $\alpha$ , TGF- $\beta$ , and HLA-DR expressions were found higher in Group 2 compared to Group 1 ( $p < 0.01$ ). The degree of PTC destruction and C4d expression increased with increasing leukocyte and macrophage infiltration in PTCs and interstitium ( $p < 0.001$ ). The development time of IF and TG decreased with increasing intensity of PTC and interstitial infiltration, glomerulitis, PTC destruction, and C4d expression ( $p < 0.01$ ). Also, the development of IF and TG shortened with increasing HLA-DR, TNF- $\alpha$  expression in inflammatory cells and increasing TNF- $\alpha$ , TGF- $\beta$ , HLA-DR expression in tubular cells ( $P < 0.01$ ). Overall the 1-, 3- and 5-year graft survival was 96%, 92%, and 79%, respectively, for Group 1 patients, while 95%, 40%, and 10% respectively for Group 2 recipients ( $p < 0.001$ ).

**Conclusion:** The prognosis and course of antibody-mediated vascular rejection are noticeably different from pure AMR, with antibody-mediated vascular rejection having the poorest outcome through leading the early development of IF and TG via augmenting inflammatory and fibrotic pathways. Thus, developing new treatment strategies for antibody-mediated vascular rejection could salvage many kidney allografts.



## 05

## Pediatric Renal Transplant Recipients Admitted to The Intensive Care Unit: A Retrospective Study

**Fatma İrem Yeşiler<sup>1</sup>, Deniz Kaya<sup>1</sup>, Helin Şahintürk<sup>1</sup>, Ender Gedik<sup>1</sup>, Pınar Zeyneloğlu<sup>1</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>Department of Anesthesiology and Critical Care, Başkent University Faculty of Medicine, Ankara, Turkey

<sup>2</sup>Department of General Surgery, Division of Transplantation, Baskent University Faculty of Medicine, Ankara, Turkey

**Introduction:** Renal transplantation (RT) is the best treatment for pediatric patients with end-stage kidney disease (ESKD). Pediatric RT recipients may need follow-up in intensive care unit (ICU). However, there is a lack of studies and data about pediatric RT recipients admitted to ICU. Approximately 10% of adult RT recipients need intensive care unit, most commonly 6 months after RT. The aim of this study is to identify the demographic characteristics, main reasons and outcomes of pediatric RT recipients admitted to the ICU during the early and late postoperative period.

**Methods:** Medical records of all patients <18 years old who underwent RT between May 2011 and October 2021 were reviewed retrospectively.

**Results:** In the study period, 115 pediatric patients underwent RT. Out of 115 RT recipients, 19 of them (16.5%) were admitted to ICU with a mean age of  $10.2 \pm 4.9$  years (range 1-17 years) including 13 males (68.4 %) and 6 females (31.6 %). The mean body weight, height and body mass index (BMI) were  $31 \pm 17.2$  kg,  $127 \pm 27.1$  cm,  $17.7 \pm 4.4$  kg/m<sup>2</sup>, respectively. According to BMI, 14 recipients were underweight, 4 normal, and 1 obese. Eighteen of the transplanted organs were from living donors (94.7%). The most common comorbidity was hypertension (21.2 %). The etiologies of ESKD included cystic-hereditary-congenital diseases (n=8, 42.1%), congenital anomalies of the kidney and urinary tract (CAKUT) (n=5, 26.3%), primary glomerular diseases (n=4, 21.1%) and large vessel diseases (n=2, 10.5%). Ten patients (52.6%) were admitted to ICU more than 6 months after transplantation. The most common immunosuppression regimen was the combination of prednisolone, mycophenolate mofetil, and tacrolimus (57.9%). Renal replacement therapy (RRT) was performed to 78.9 % (n=15) of the recipients before transplantation. The main causes of ICU admission were epileptic seizure (31.6%, n=6), respiratory failure (21.1%, n=4) and cardiac diseases (10.5 %, n=2).

Five (26.3%) and 4 (21.1%) patients required invasive mechanical ventilation and RRT during ICU follow-up. The mean length of stay in the ICU and hospital were  $12.4 \pm 28.5$  and  $25.8 \pm 29.4$  days, respectively.

The hospital mortality rate was 3.5 %. Main causes of death in the ICU were hemorrhagic cerebrovascular disease, cardiogenic shock secondary to pericardiocentesis and acute hepatic failure.

**Conclusion:** In our cohort, study, CAKUT and focal segmental glomerular sclerosis were the most common causes of ESKD among children similar with reported studies. Pediatric RT recipients differ from adults in many aspects such as clinical features, causes, and complications. Although acute respiratory failure, septic shock and acute kidney injury are more frequently reported reasons for ICU admission among adult RT recipients, in our children most common ICU admissions were due to epileptic seizure and acute respiratory failure. The ICU and hospital survival rates of our pediatric RT recipients were 78.9% and 97%, respectively. Therefore, successful management for pediatric RT recipients admitted to ICU requires a multidisciplinary approach with coordination between pediatric nephrologists, transplantation surgeons and intensive care team.

## 06

## Association Between Vitamin D Deficiency and Anemia in Pediatric Renal Transplant Recipients

**Begum Avci<sup>1</sup>, Esra Baskin<sup>1</sup>, Kaan Gulleroglu<sup>1</sup>, Aysun Caltik Yilmaz<sup>1</sup>, Emre Karakaya<sup>2</sup>, Gokhan Moray<sup>2</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

**Introduction:** It has been shown that low vitamin D level is associated with low Hb concentration and anemia. The relationship between vitamin D deficiency and anemia has been evaluated in patients with CKD. However, there is no study examining this relationship in renal transplantation patients. In this study, we examined the relationship between Vitamin D levels and anemia in pediatric renal transplant patients.

**Materials and Methods:** Records of pediatric renal transplant recipients (aged 0-18 years), who were followed up at Baskent University between January 2011 and June 2021 for at least one-year after renal transplantation, were examined retrospectively. Transplant age, donor type, immunosuppressive treatments, infection, rejection, graft loss status and complete blood count, serum iron (Fe), serum iron-binding capacity (SDBK), ferritin, urea, creatinine, calcium, phosphorus, alkaline phosphatase, parathyroid hormone (PTH) values, and Glomerular Filtration Ratio (GFR) values were recorded. Anemia was defined as hemoglobin level below 11 g/dl; vitamin D deficiency defined as 25(OH)-D values were <20 ng/ml. Patients were grouped according to their 25(OH)-D levels (<20 ng/ml; group 1, 20-30 ng/ml; group 2, >30 ng/ml; group 3).

**Results:** Seventy-five patients were included in to study. The mean age of renal recipients was 11.8±4.9 years (34 girls and 41 boys). There were 41 patients (54.7%) in group 1, 24 patients (32%) in group 2, and 10 patients (13%) in group 3. The groups were similar in terms of gender, transplantation age, donor type, immunosuppressive therapy, and follow-up times. Mean hematocrit and ferritin levels were found to be significantly lower in group 1 when compared with the other groups (p<0.05). However, there was no significant difference between the groups in terms Hgb, serum Fe, transferrin saturation and serum Ca, P, ALP, and PTH values (p>0.05). Serum Fe levels were low in patients with vitamin D deficiency, but no statistically significant difference was found. The groups were similar in terms of infection, rejection, graft loss, and 3rd-year eGFR (p>0.05).

Anemia was present in 20 (26.6%) patients. and 94% of these had Vitamin D deficiency or insufficiency in 7 (12.7%) patients without anemia Vitamin D levels were within normal limits, while only 1 (5.6%) of patients with anemia had normal Vitamin D levels. Vitamin D levels were found to be lower in patients with anemia. PTH and eGFR values were similar in with and without anemia group. There was no significant difference between the two groups in terms of infection (45%, 38%; p>0.05), rejection (45%, 29%; p>0.05) and graft loss (5%, 1.8%; p>0.05).

**Conclusion:** Vitamin D deficiency is a treatable risk factor for graft loss and mortality in patients with persistent anemia after renal transplantation Vitamin D levels of the patients should be followed up and if deficiency is detected, it should be treated. Further studies are needed on the relationship between Vitamin D level and anemia in renal transplant patients.

## 07

## The Beneficial Impact of D3 Vitamin on the Decline of Rejection, Epithelial-Mesenchymal Transition (EMT), and Interstitial Fibrosis Among Pediatric Renal Transplant Patients

**B. Handan Özdemir<sup>1</sup>, Eda Yılmaz Akçay<sup>1</sup>, Esra Baskın<sup>2</sup>, F. Nurhan Özdemir<sup>3</sup>, Mehmet Haberal<sup>4</sup>**

<sup>1</sup>Baskent University Faculty of Medicine, Department of Pathology, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

<sup>3</sup>Baskent University Faculty of Medicine, Department of Nephrology, Ankara, Turkey

<sup>4</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

**Introduction:** Vitamin D3 is known to prevent T-cell proliferation and inhibit the production of TNF- $\alpha$ . Vitamin D3 also has a critical role in reorganizing the cytoskeletal of the cells and E-cadherin (Ecad) expression necessary for maintaining the epithelial state. Ecad downregulation is considered a hallmark of EMT. We aimed to understand the role of D3 in the development of acute rejection (AR), EMT, and interstitial fibrosis (IF).

**Materials and Methods:** Of 51 cases, 24 were treated with D3 (Group D), and 27 did not (Group C). The intensity of interstitial macrophage and lymphocyte infiltration graded in the first indication biopsies. The  $\alpha$ -SMA and paxillin expression on tubules were evaluated to detect EMT development. Additionally, tubular TGF- $\beta$ , TNF- $\alpha$ , and Ecad expression were studied. Follow-up biopsies were analyzed for the development of IF during 18 and 24 months after transplant.

**Results:** Both AR and IF development during 18 and 24 months was found lower in Group D than Group C ( $p < 0.001$ ). Group D patients showed higher degrees of tubular Ecad expression than Group C ( $p < 0.001$ ). Tubular,  $\alpha$ -SMA, paxillin, TGF- $\beta$ , and TNF- $\alpha$  were found significantly lower in Group D than Group A ( $p < 0.001$ ). Tubular  $\alpha$ -SMA, paxillin, TNF- $\alpha$ , and TGF- $\beta$  expression positively correlated with the IF development ( $p < 0.001$ ). The degree of inflammatory cells showed a positive correlation with the tubular  $\alpha$ -SMA, paxillin, TNF- $\alpha$ , and TGF- $\beta$  expression ( $p < 0.01$ ). In contrast, they showed a negative correlation with E-cad expression ( $p < 0.01$ ). Tubular E-cad expression was negatively associated with the IF,  $\alpha$ -SMA, paxillin, TNF- $\alpha$ , and TGF- $\beta$  expression ( $p < 0.001$ ). The overall -5 and 10-year graft survival was 91% and 87 % for Group D, 70% and 63% for Group C, respectively ( $p < 0.05$ ).

**Conclusion:** With increasing degree of inflammation, TNF- $\alpha$  and TGF- $\beta$ , the activation of EMT and therefore the occurrence of IF was found higher in Group C cases who had increased  $\alpha$ -SMA and paxillin expression with Ecad downregulation. Contrarily, Group D patients had a lower incidence of AR, EMT, IF, and favorable graft prognosis. Thus, D3 therapy is beneficial in renal transplant patients with its antifibrotic and immune modulator properties.

## 08

**Results of Kidney Transplantation in “Tbilisi State Medical University and Ingorokva High Medical Technology University Clinic LLC”**

**Kiladze S.<sup>1</sup>, Kasradze T.<sup>2</sup>, Tomadze G.<sup>3</sup>, Chokhnelidze I.<sup>2</sup>**

<sup>1</sup> *Department of General Surgery and Transplantation, Tbilisi State Medical University and Ingorokva high Medical Technology University Clinic LLC.*

<sup>2</sup> *Department of Nephrology, Tbilisi State Medical University and Ingorokva high Medical Technology University Clinic LLC.*

<sup>3</sup> *Surgery Department Tbilisi State Medical University, President, Georgian Association of Transplantologists*

**Abstract:** Kidney transplantation is the treatment of choice for a minority of patients with end-stage renal disease (ESRD). Most adult patients with ESRD are never referred for evaluation for transplantation, and have a 60-70% 5 – year mortality on dialysis. Pediatric patients are less lucky as there is no center for pediatric kidney transplantation in Georgia. Improved technology, surgical skills, adequate immunosuppression therapy, great support from Georgian Association of Transplantologists (GAT) and financing from government gave us ability to perform organ transplantation and have good results. Graft survival and long-term graft function have made kidney transplantation a more cost-effective alternative to dialysis.

**Materials and Methods:** Since 1995, according to the National Transplant Registry of Georgia Association of Transplantologists there are 473 recipients. 140 liver recipients and 327 kidney recipients and 6 heart recipients. Totally in Georgia was done 430 organs transplantation: 349 kidneys and 81 LivTx. Nowadays in Georgia there are 3 centers where is done organ transplant: Evex hospitals - living related liver transplantation, Urology center in Tbilisi -living related kidney transplantation and Tbilisi State medical university and Ingorokva high medical technology university clinic LLC - living related kidney transplantation. Our center “Tbilisi State medical university and Ingorokva high medical technology university clinic LLC” is the biggest nephrology center in Georgia. About 600 patients get dialysis in 3 shifts. Clinic got emergency nephrology service and kidney transplantation service. In our team, there are 16 nephrologists, 1 transplant surgeon, 1 anesthesiologist, 2 general surgeons. Laboratory service for organ transplantation. Since 2011 in our center was performed 103 living related kidney transplantation. Nowadays it is the biggest kidney transplant center in Georgia. Donor male/female ratio 30%/70%. Average age of the donor 45-60 y. Recipient 28-51y. 1-year graft survival is 95%, 5 years graft survival 90%. Etiology of ESRD in transplanted patients: FMF 3.5%, DM 12.18%, ADPKD 5.7%, GN 14.21%, Urological etiology 4.6%, Nephrosclerosis unknown etiology 29.43%. HLA sensitization: 88% no sensitized patients, 12% sensitized patients. Acute rejection rate TCMR – 12.5%, ABMR 6.9%. Last year with our Belarus colleagues, we started pediatric kidney transplantation program. We did one living related pediatric kidney transplantation operation. Operation was successful. Recipient was 5 years old boy with hypoplasia. Donor 52 years old grandmother.

**Conclusion:** Our future plans are to increase kidney transplant program in adult and pediatric patients. To start laparoscopic donor nephrectomies, start liver transplantation programme and start cadaveric organ transplant programme.



## Pediatric Kidney Transplantation Experience in Kazakhstan

**B. Altinova**

*University Medical Center, Nursultan, Kazakhstan*

**Aim:** To analyze the accessibility of children with chronic renal failure to kidney transplant in Republic of Kazakhstan and effectiveness of implementation of comprehensive program on kidney transplant for children in Republic of Kazakhstan.

**Materials and Methods:** Pediatric patients were referred to other countries for kidney transplant since 1991. Kidney transplant procedures started to be performed in Republic of Kazakhstan in 1997. Generally, cadaveric kidney transplant procedures were being performed (56%). Kidney transplant was performed for total 56 children within 20 years (until 2011). Pediatric kidney transplant program has been implemented in Republic of Kazakhstan since 2012. 109 pediatric kidney transplant procedures were performed in Republic of Kazakhstan within this period (11 years).

**Findings:** Number of children receiving renal replacement therapy (dialysis) is 73 as of 2021. This corresponds to 14 children out of every 1 million children. Number of children “starting” dialysis therapy is 16 per year. There are 82 children on the waiting list. This corresponds to 14 children out of every 1 million children. The kidney transplant program for children which started to be implemented in 2012 provided highly successful outcomes that can be compared to the outcomes around the world: 1-year survival rate of recipients has been calculated as 95.7% / 93.6%, 3-year survival rate is 93.0% / 85.5% and 5-year survival rate is 88.6% / 83.1%. Preemptive kidney transplant was performed for 20% of recipients. Cadaveric organ transplant was performed for 30.7% of total 109 recipients.

**Results:** Kidney transplant is the most effective social rehabilitation method for children with end stage chronic renal failure. Support of the government in pediatric transplantology have helped boosting the quality of life for children with end stage chronic renal failure.

## O10

## Experience in Kidney Transplantation in Children with Steroid-Resistant Nephrotic Syndrome

**Gani Kuttymuratov<sup>1</sup>, Ardak Aynakulov<sup>2</sup>, Venera Altynova<sup>3</sup>, Saltanat Rakhimzhanova<sup>3</sup>, Samat Issakov<sup>3</sup>, Myltykbay Rysmakhanov<sup>1</sup>**

<sup>1</sup>“University Medical Center” Corporate Foundation, Department of Organ Transplantation, Kazakhstan

<sup>2</sup>“University Medical Center” Corporate Foundation, Department of Urology and Kidney Transplantation, Kazakhstan

<sup>3</sup>“University Medical Center” Corporate Foundation, Department of Nephrology, Dialysis and Kidney Transplantation, Kazakhstan

**Introduction:** Kidney transplantation in children with end-stage renal failure associated with steroid-resistant nephrotic syndrome (SRNS) is a difficult task due to the lack of effect when using immunosuppressive therapy and the return of the disease after transplantation. SRNS can be return as early as 24 hours after kidney transplantation.

**Materials and Methods:** From 2018 to 2021 four kidney transplants were performed (three from a living donor and one from a cadaver) in children with morphologically diagnosed Focal segmental glomerulosclerosis (FSGS), manifested by SRNS. Proteinuria, arterial hypertension, edema was clinically observed in all patients. They received hemo- or peritoneal dialysis with an average duration of  $3\pm 1.5$  years. The children were  $7\pm 2$  years old. Before transplantation, all patients underwent a genetic study–full exome sequencing, as a result of which the presence of specific genetic disorders that were the cause of the development of SRNS was revealed.

**Results:** After transplantation, all children had proteinuria. In order to prevent recurrent NS, they underwent plasma exchange therapy two to three times a week on days 2–4 after surgery. The volume of plasma replacement ranged from 800 to 1,400 mL for one session. One child also developed transplant dysfunction. In two children after three and five plasma exchange sessions, respectively, proteinuria was arrested, the function of the graft remained satisfactory. The third child with proteinuria continues to receive plasma exchange without impairing the function of the graft. Immunosuppressive therapy included basiliximab, cyclosporine, mycophenolate mofetil and glucocorticoid.

**Conclusions:** In patients with SRNS, serological examination of donor-specific antibodies, histopathological examination, genetic research to predict the course of the disease and determine the tactics of treatment after transplantation should be performed. After kidney transplantation, it is necessary to conduct plasma exchange sessions to prevent graft dysfunction. The diagnosis of FSGS graft return can be established on the basis of nephrobiopsy.



011

## Renal Poly (ADP-Ribose) Polymerase (PARP) Expression Augments the Development of Epithelial-to-Mesenchymal Transition (EMT), Transplant Glomerulopathy, and Interstitial Fibrosis in Pediatric Patients with Antibody-Mediated Rejection

**B. Handan Özdemir<sup>1</sup>, Alev Ok Atılğan<sup>1</sup>, Esra Baskın<sup>2</sup>, F. Nurhan Özdemir<sup>3</sup>, Mehmet Haberal<sup>4</sup>**

<sup>1</sup>Baskent University Faculty of Medicine, Department of Pathology, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

<sup>3</sup>Baskent University Faculty of Medicine, Department of Nephrology, Ankara, Turkey

<sup>4</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

**Introduction:** It is well known that PARP activation increases inflammation, but its role in developing EMT, interstitial fibrosis (IF), and transplant glomerulopathy (TG) are still unclear. Therefore, we investigate the role of PARP in the development of EMT, IF, and TG in recipients with antibody-mediated rejection (AMR).

**Materials and Methods:** A total of 45 pediatric cases with AMR were included in to study. Expressions of tubular and glomerular PARP,  $\alpha$ -SMA, TNF- $\alpha$ , TGF- $\beta$ , and HLA-DR, were studied. Tubular  $\alpha$ -SMA expression was noted as tubular EMT. Peritubular capillary (PTC) and interstitial leukocytes were highlighted with PARP, TNF- $\alpha$ , HLA-DR, and CD68. Follow-up biopsies were analyzed for IF and TG development.

**Results:** PARP expression in tubules, glomeruli, and infiltrated leukocytes was positively correlated with PTC, glomerular, and interstitial leukocyte and macrophage infiltration ( $p < 0.001$ ). Tubular and glomerular PARP expression also correlated with PTC and interstitial leukocyte PARP, TNF- $\alpha$ , TGF- $\beta$ , and HLA-DR expression ( $p < 0.001$ ). Tubular  $\alpha$ -SMA expression (EMT development) positively correlated with tubular, glomerular, PTC, interstitial, PARP, TNF- $\alpha$ , HLA-DR, and CD68 expression ( $p < 0.01$ ). C4d expression positively correlated with an increasing degree of leukocyte and macrophage infiltration in PTCs and interstitium ( $p < 0.001$ ). Expression of PARP in tubules, PTCs, interstitium, and glomeruli was shown to increase with the intensity of C4d expression ( $p < 0.01$ ). Response to rejection treatment decreases with increasing tubular, interstitial, PTC, glomerular PARP, TNF- $\alpha$ , HLA-DR, and CD68 expression ( $p < 0.01$ ). The development time of IF was negatively correlated with the increasing PTC and interstitial leukocyte and macrophage infiltration ( $p < 0.001$ ). The incidence of IF and TG development was found to increase with an increasing degree of renal PARP expression and tubular EMT development ( $p < 0.01$ ). Additionally, the IF development time shortened with increasing PARP, HLA-DR, TNF- $\alpha$ , TGF- $\beta$ ,  $\alpha$ -SMA expression in inflammatory and tubular cells ( $P < 0.01$ ).

The mean graft survival time decreased with increasing interstitial, tubular PARP, and  $\alpha$ -SMA expression ( $p < 0.01$ ). The 5-year graft survival was 96% for recipients with negative tubular PARP while 60%, 19%, and 18% for recipients with grade 1, grade 2, and grade 3 tubular PARP expression, respectively ( $p < 0.001$ ).

**Conclusion:** Increased PARP activation leads to early graft loss by augmenting inflammation and IF via activation of inflammatory signaling pathways and tubular cells' myofibroblastic differentiation (EMT). Therefore, we suggest that PARP inhibitor drugs combined with immunosuppressive therapy may control inflammation and fibrosis to prevent early graft loss.

**O12****An Unusual Cause of Elevated Serum Creatinine After Kidney Transplantation in an Adolescent**

**Emre Leventoğlu, Bahar Büyükkaragöz, Kibriya Fidan, Oğuz Söylemezoğlu, Sevcan A. Bakkaloğlu, Necla Buyan**

*Gazi University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey*

**Introduction:** Acute phosphate nephropathy is an unusual and overlooked cause of acute or chronic kidney dysfunction. Patients exposed to high doses of phosphorus who had already impaired kidney functions are at greater risk of developing acute phosphate nephropathy (1).

**Materials and Methods:** Here, we present an adolescent patient who was given phosphorus supplementation due to hypophosphatemia after kidney transplantation and consequently had deterioration in graft functions.

**Results:** A 15-year-old female with kidney failure due to autosomal recessive polycystic kidney disease with a combined heterozygous mutation in the PKHD1 gene [Exon35: c.5735G>A (p.W1912\*); Exon33: c.5353T>C (p.F1785L)] received a living donor kidney transplantation in 2017. The fully-matched donor was her mother and her serum creatinine was 0.71 mg/dL before kidney harvest. She received antithymocyte globulin for the induction immunosuppression; corticosteroids, tacrolimus and mycophenolatemofetil were commenced as the maintenance therapy. Serum creatinine was 0.56 mg/dL on the post-transplant 5<sup>th</sup> day, but asymptomatic hypophosphatemia of 1.38 mg/dL was present. Therefore, oral phosphate solution at a dose of 50 mg/kg/day was prescribed. On the post-transplant 13<sup>th</sup> day, elevation of serum creatinine to 1.22 mg/dL was noted. Results of additional laboratory studies for the evaluation of kidney dysfunction at that time are listed in Table 1.

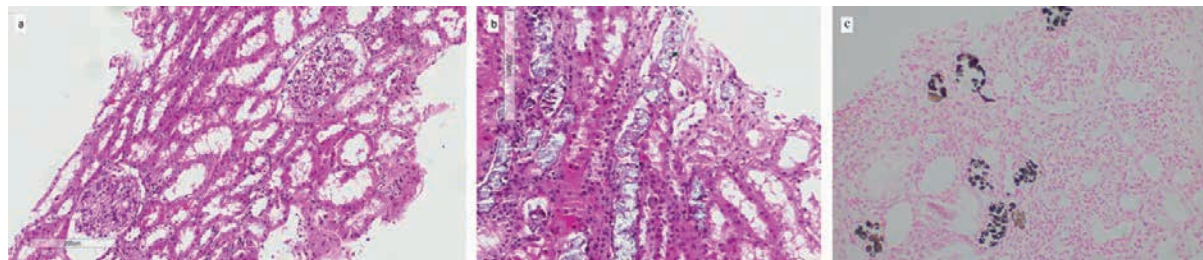
The patient was admitted for kidney biopsy. In the tubular system, blue-violet crystal structures compatible with diffuse luminal calcium phosphate deposition, especially in the distal tubular segments were detected. These crystals were positively stained with von Kossa dye and did not reflect under polarized light. The biopsy images are shown in Figure 1. With these findings, the patient was diagnosed as acute phosphate nephropathy.

The oral phosphorus solution was discontinued initially and serum creatinine declined to 0.73 mg/dL with this intervention. However, after a very short time, the oral phosphorus solution had to be started again at a lowest recommended dose (30 mg/kg/d, twice daily) because the serum phosphorus decreased to 1.1 mg/dL and the patient had profound muscle weakness. Abundant hydration was provided. The treatment was used for overall one month by cautiously monitoring the serum creatinine and phosphate levels. At the end of this period, serum creatinine and phosphorus were 1.01 and 3.04 mg/dl, respectively.

Control allograft biopsy was performed in the 1st post-transplant year, and it revealed persistence in the findings in terms of acute phosphate nephropathy as well as moderate degrees of tubular atrophy and interstitial fibrosis. Nevertheless, at the last visit of our patient in the 4th post-transplant year in October 2021, no significant deterioration in the kidney functions was observed when compared to the time she was diagnosed with acute phosphate nephropathy; her current serum creatinine level is 1.36 mg/dL.

**Conclusion:** With this case, we would like to emphasize that it should be kept in mind that even when using a drug that seems innocent, especially in kidney transplant recipients, the possibility of causing allograft dysfunction should be considered while prescribing each drug. Therefore, all physicians also need to weigh the risks and benefits when starting oral phosphorus supplementation at the post-transplantation period.

**Figure 1.** The first biopsy, H&E and von Kossa. Neither glomerulitis nor capillaritis were seen. There were no thrombi in the capillary lumens (a). Acute tubular injury findings were accompanied by blue-purple, irregular, mostly spherical crystals in the lumen of the distal tubules (b). Blue-violet crystal structures compatible with diffuse luminal calcium phosphate deposition in the distal tubular segments (c).



### References:

1. Abcar A, Hever A, Momi JS, Sim JJ (2009) Acute phosphate nephropathy. *Perm J* 13:48-50.

**Table 1.** Laboratory Values Pre and Post-Transplantation

	pre-Transplantation Period	post-Transplantation Period				Reference values
		5th day	13th day	1st year	4th year	
<b>Blood</b>						
BUN (mg/dL)	39	17	12	33	31	5-18
Creatinine (mg/dL)	5.91	0.56	1.22	1.37	1.36	0.26-0.77
Ca (mg/dL)	9.1	9.3	8.6	9.6	8.8	8.4-10.2
P (mg/dL)	6.2	1.38	2.87	3.6	2.50	2.3-4.5
25-hydroxyvitamin D (ng/mL)	26			20	13	30-50
PTH (pg/mL)	1194.7	923		252.5	390.5	12.2-77.4
pH	7.42	7.42	7.42	7.40	7.39	7.35-7.45
HCO <sub>3</sub> (mmol/L)	22.1	21.3	23.4	24.6	20.3	22.0-30.0
BE (mmol/L)	-1.6	-2.4	-1.4	0.3	-3.9	(-2)-(+2)
Tacrolimus (ng/mL)		11.4	10.2	8.3	6.5	4-11
<b>Urine</b>						
pH	8.0		6.5	6.5	6.0	5.0-7.5
Density	1005		1010	1004	1010	1005-1030
Leukocyte esterase	+		+	-	-	-
Nitrate	-		-	-	-	-
Hb	Trace		Trace	-	Trace	-
Leucocyte (/HPF)	23		19	1	1	<5
Erythrocyte (/HPF)	3		4	6	5	<5
Protein (mg/day)	652.5		359.8	204.8	213.0	<150
Volume (mL/day)	630	2990	3900	3650	2600	

BUN: Blood urea nitrogen; Ca: Calcium; P: Phosphate; PTH: Parathormone; HCO<sub>3</sub>: Bicarbonate; BE: Base excess; Hb: Hemoglobin

**O13**

## Clinical Different Presentation of Family Members with the Same Homozygot DGKE Mutation: A Case Series

Evra Çelikkaya<sup>1</sup>, Tülin Güngör<sup>1</sup>, Deniz Karakaya<sup>1</sup>, Evrin Kargın Çakıcı<sup>1</sup>, Fatma Yazılıtaş<sup>1</sup>, Fatih Özaltın<sup>2</sup>

<sup>1</sup>*Dr. Sami Ulus Maternity Child Hospital, Department of Pediatric Nephrology, Ankara, Turkey*

<sup>2</sup>*Hacettepe University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey*

**Introduction:** Membranoproliferative GN (MPGN) and renal microangiopathies may manifest similar clinical presentations and histology. Diacylglycerol kinase  $\epsilon$  (DGKE) is an intracellular lipid kinase that phosphorylates diacylglycerol to phosphatidic acid that is present in endothelial cells, platelets, and podocytes. The mutations in the gene encoding DGKE identified a novel pathophysiologic mechanism leading to atypical hemolytic-uremic syndrome (aHUS) and/or MPGN. Nephrotic syndrome, as reported in some individuals with DGKE mutations, is characterized by heavy proteinuria ( $>3.5$  g/d) and is universally associated with alterations of the podocyte cytoskeleton and effacement of podocyte foot processes.

In this study we wanted to examine the different clinical presentations and treatments in family members carrying the same homozygous DGKE mutation, this case series may provide new insights into the corresponding function analysis of the DGKE protein.

**Case Series Report:** In this study, we describe a family of four individuals with DGKE nephropathy. The first patient was 5 years and 3 months old at diagnosis, he applied with the clinic of nephrotic syndrome. The kidney biopsy of the patient who was accepted as steroid resistant nephrotic syndrome resulted as MPGN; partial remission was achieved with cyclophosphamide, cyclosporine and mycophenolate mofetil in the treatment. The second patient, age at diagnosis 5 years and 7 months, presented with overlapping aHUS/MPGN. The remission could not be achieved with cyclophosphamide, cyclosporine, mycophenolate mofetil in the treatment. In the process, CKD developed, hemodialysis treatment was started in the patient whose estimated glomerular filtration rate (eGFR) rapidly decreased below 15, he reached end stage kidney disease (ESRD) 10 years from the first admission in the follow-up, and kidney transplantation was performed successfully.

The third patient was admitted with the diagnosis of nephrotic syndrome at 13 months of age, the kidney biopsy of the patient was concluded as MPGN due to the history found in the cousins, and spontaneous remission developed in the follow-up. He presented with atypical HUS clinic 15 months after the first admission. Dialysis was needed due to volume overload, plasma infusion was administered, remission was not achieved, partial remission was achieved with eculizumab treatment, complete remission was achieved by arranging plasma infusion and eculizumab treatment together, and the treatment is continued with plasma infusion. The fourth patient's sibling was examination and genetic analysis was sent. The same mutation was described in the 7-month-old patient who had no clinical or laboratory findings. We performed genetic analysis, and the mutation in exon 2:c.473G>A(p.W158\*) was detected.

**Discussion:** In the family with the same mutation, 1 cases showed clinical and histological MPGN patterns without TMA, while the other 2 cases progressed with overlapping clinical and histological aHUS/MPGN, another case did not show clinical signs at an early age. In conclusion, we did not observe a clear genotype-phenotype correlation in patients with DGKE nephropathy, suggesting additional factors mediating phenotypic heterogeneity. In addition, the benefits of anti-complement therapy are questionable, but plasma infusion may be a viable option in the treatment of patients and kidney transplantation is the curative treatment for patients with end stage renal disease.

**O14****Covid-19 Infections and Pediatric Renal Transplant Recipients**

**Aysun Caltik Yilmaz<sup>1</sup>, Esra Baskin<sup>1</sup>, Kaan Gulleroglu<sup>1</sup>, Aydinca Akdur<sup>2</sup>, Gokhan Moray<sup>2</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>*Department of Pediatric Nephrology, Baskent University School of Medicine, Ankara, Turkey*

<sup>2</sup>*Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey*

The most of research to date indicates that children who have received a renal transplant are not at elevated risk of COVID-19 infection and generally have a mild illness course. Children are recognized as having a lower risk of severe COVID-19 infection than adults, although the most of pediatric renal transplant recipients had mild symptoms, severe illness and death have been reported in a small proportion of patients.

We present 26 cases of COVID-19 infection from 215 pediatric patients with kidney transplantation. The average age of the patients was 14.2 (range 4-19), with 11 of them were female. The mean follow-up time after transplantation was 66.8 (range 6-148) months. In 16 patients (61.5%), fever was the most frequent symptom. Seventeen patients (65%) had mild respiratory symptoms such as cough, chest pain and loss of smell. Our 5 patients (21%) needed hospitalization. Four of them also developed acute kidney injury. One of these patients was hospitalized with a diagnosis of COVID-19 infection one week after being treated with IVIG and rituximab for acute antibody-mediated rejection. That patient developed significant lung disease and multi-organ failure. The second patient was a 5-year-old male who was admitted to the hospital due to diarrhea and required fluid and electrolyte replacement. Other hospitalized patients developed pneumonia but did not require intubation and recovered fully with antibiotic, antiviral and supportive therapy. Most of our patients (80.7%) had minor symptoms and recovered completely after receiving supportive treatment. Even though 23 of the patients were in close contact for COVID-19, the transmission could not be demonstrated by PCR test, and the patients did not exhibit any symptoms.

According to our experience, COVID-19 is generally overcome with mild symptoms in pediatric renal transplant patients. Due to new vaccines and new virus strains, the clinical picture may alter in coming years.

**O15**

## Use of Eculizumab in Pediatric Patients with Late Antibody-Mediated Rejection After Kidney Transplantation

Meraj Alam Siddiqui<sup>1</sup>, Esra Baskin<sup>1</sup>, Feza Yarbug Karakayali<sup>2</sup>, Atilla Gemici<sup>1</sup>, Kaan Gulleroglu<sup>1</sup>, Aysun Caltik Yilmaz<sup>1</sup>, Gokhan Moray<sup>2</sup>, Mehmet Haberal<sup>2</sup>

<sup>1</sup>Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

**Background:** Late antibody-mediated rejection (ABMR) triggered by donor-specific antibodies (DSA) is a leading cause of kidney allograft failure. Effective treatment options for late ABMR are limited in renal transplant patients. Here, we report two pediatric cases of severe late ABMR resistant to conventional immunosuppressive therapy successfully treated with eculizumab.

**Methods:** Two patients who fulfilled the late ABMR diagnostic criteria (positive DSA, elevated means fluorescence index (MFI) value, acute and/or chronic morphological lesions in the microvasculature and abnormal kidney function test) were included in this study. Both patients were previously unsensitized with panel-reactive antibody 0%.

### Results:

**Case 1:** A 12-year-old male patient with kidney failure secondary to vesicoureteral reflux (VUR) underwent related-living donor kidney transplantation 2 years ago. The patient was diagnosed with late AMR since his donor-specific antibody (DSA) was positive and means fluorescence index (MFI) value was > 10000. Despite an aggressive conventional ABMR treatment, signs of rejection persisted. The patient was treated with 2 doses of eculizumab. Following the eculizumab treatment, MFI value dropped below 10000. The serum creatinine level dropped from 3.8 mg/dL to 1.5 mg/dL.

**Case 2:** An unsensitized 16-year-old male patient of Turkish ethnicity with kidney failure secondary posterior urethral valve (PUV) underwent related-living donor kidney transplantation 4 years ago. The patient was diagnosed with late AMR since his donor-specific antibody (DSA) was positive and means fluorescence index (MFI) value was > 10000. Despite an aggressive conventional immunosuppressive regimen, signs of rejection persisted. This patient was also treated with 2 doses of eculizumab. Following the eculizumab treatment, MFI value dropped below 10000 and serum creatinine level decreased from 2.1 mg/dL to 1.01 mg/dL.

**Conclusion:** In both patients, eculizumab therapy effectively reduced the markers of late antibody-mediated rejection and improved the kidney function. An early initiation of eculizumab treatment as primary therapy is safe and effective for late antibody mediated graft rejection in kidney transplant patient.



016

## Pediatric Liver Transplantation: The Experience of Single Center

Gani Kuttymuratov<sup>1</sup>, Dulat Mustafinov<sup>2</sup>, Arailym Baizhanbayeva<sup>2</sup>, Omar Mamlin<sup>2</sup>, Myltykbai Rysmakhanov<sup>1</sup>, Damir Jenalayev<sup>2</sup>

<sup>1</sup>“University Medical Center” Corporate Foundation, Department of Organ Transplantation, Kazakhstan

<sup>2</sup>“University Medical Center” Corporate Foundation, Department of Pediatric Surgery, Kazakhstan

**Introduction:** Congenital liver damage in children is still an urgent problem. Liver transplantation is currently the only and optimal method for treating terminal liver diseases. Palliative interventions, like Kasai's portoenterostomy, in most cases do not give the desired and long-term effect.

**Materials and Methods:** 13 children's liver transplants were performed in our center from 2014 to 2021, and all of them were performed from a living donor. The ages of the children ranged from 6 to 17 months. The body weight of the recipients ranged from 11 to 36 kg. The causes of terminal liver damage were congenital malformations, mainly biliary atresia. In one case, the child suffered from Budd-Chiari syndrome. Other causes of cirrhosis in children were intrauterine infections (cytomegalovirus). All transplants were performed according to the group compatibility of the donor and recipient. The donors were the relatives of the patients. In all cases, the left lateral sector (1 and 2 segments) of the liver was implanted. Immunosuppressive therapy included: induction - basiliximab, basic - tacrolimus, MME, glucocorticoids.

**Results:** Of the 13 transplants performed, various complications were observed in 4 cases (30.8%). All complications were corrected by repeated surgery. In the early post-transplant period, complications were observed in two recipients. One child had a hepatic artery thrombosis. Re-anastomosis of the artery was not successful. Immediately, the child underwent liver retransplantation from a living donor. In the second case, there was a portal vein thrombosis, after reanastomosis of which the blood flow was restored. In 2 cases, in the long-term period after transplantation, biliary stricture developed. In both cases, patency was restored by the method of percutaneous transhepatic cholangiostomy or biliary drainage.

The mortality rate was 7.7% (1 child). The cause of mortality was sepsis against the background of a functioning hepatic transplant. The donors had no complications. The duration of the surgery was  $3 \pm 1.8$  h in donors and  $8.2 \pm 3$  h in recipients.

The average length of stay of donors in the hospital was 13.2 bed-days; the recipients were in the hospital on average 42.4 bed-days.

Of the 13 liver transplants performed in children, we independently performed 4 operations. Colleagues from Turkey, India, and Belarus performed the rest of the transplantations.

**Conclusion:** We consider liver transplantation from a living donor to children to be a more optimal method of treatment compared to transplantation from a cadaveric donor. Removing the left lateral liver for transplantation is safer for a living donor.

**O17**

## **Predisposing Risk Factors Affecting the Early Outcome in Liver Transplant Patients Younger Than 3 Years**

**Ebru H. Ayvazoğlu Soy**

*Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey*

**Introduction:** Outcome of the liver transplantation improved with the advances in surgical techniques. Here we aimed to report our early outcome of the liver transplant recipients younger than 3 years old and to evaluate the predisposing factors affecting the early outcome of this challenging group.

**Materials and Methods:** Since December 1988, we performed 701 liver transplant (LT) procedures (334 pediatric, 367 adult) at our center. Among these 334 pediatric liver transplants, 146 patients were younger than 3 years old. We retrospectively evaluated the demographic and surgical features of these patients younger than 3 years old and define the predisposing factors affecting the mortality during the first month of the liver transplant.

**Results:** We performed 334 pediatric LT; 146 recipients were  $\leq 3$  years, 185 recipients were  $>3$  years. Among these 146 recipients, we lost 35 LT patients and 14 of them were lost during the first month of LT. The rest 132 LT survived for longer time. The comparison of 14 early mortality LT group and 132 longer survivor LT group were retrospectively done according to the demographic data, surgical features and postoperative complications. The results showed that predictors of early mortality were found to be; preoperative high PELD score (mean 28,6 vs 20,15), preoperative low body weight (mean 7,9 vs 8,9kg), long ICU stay (mean 6,3 vs 2,7 days), long operation time (mean 9,5 vs 8,6 hrs) and long anhepatic phase (mean 81,4 vs 71,25 min).

**Conclusion:** Since management of young liver transplant recipients is a challenging issue, it should be managed multidisciplinary in experienced hands and more caution is needed for children with high PELD scores and low body weight.

018

## An Alternative Abdominal Closure Technique After Pediatric Liver Transplant: Bogota-Bag Technique

Emre Karakaya, Aydıncan Akdur, Ebru Hatice Ayvazoğlu Soy, Adem Şafak, Gökhan Moray, Mehmet Haberal

*Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey*

**Introduction:** In conditions such as large for size, post reperfusion hepatic edema, and intestinal edema, primary closure of the abdominal wall can cause respiratory complications, thrombosis of vascular structures due to compression of graft vascular structures, ischemia of the graft, and intestinal complications. In this study, we aimed to compare the results of primary abdominal closure (PAC) and temporary patch closure (bogoto-bag technique) (BB) in pediatric liver transplant recipients.

**Material and Methods:** The first liver transplant in 1988 was performed by our team. Between 8 December 1988 and 31 December 2021, we performed 701 liver transplant. Of these liver transplants 334 were pediatric and 367 were adults. We performed PAC in 295 recipients. In 39 pediatric liver transplant recipients, we preferred BB technique as the abdominal closure technique in patients with suspected intra-operative tense abdominal closure or intra-abdominal hypertension. In these patients we used this technique, we sutured the sterilized saline bag to the skin at the edge of the defect continuously with a 3/0 polypropylene suture by shaping the defect so as not to cause abdominal hypertension. PAC was achieved in patients after control laparotomies at 48-hour intervals.

**Results:** The mean age of the PAC group was 8.38 years, while the mean age of the BB group was 2 years. The average weight of the PAC group was 26.38 kg, and the average weight of the BB group was 7.93 kg. Biliary atresia was the most common indication in both groups. The mean length of hospital stay was 21 days in PAC group and 24 days in BB group. Six patients in the BB group were died due to sepsis or bleeding in the early postoperative period. Wound closure was achieved within 2 weeks in 25 patients and within 8 patients in three weeks.

**Conclusion:** Temporary patch closure technique can be used safely in experienced centers in low weight and young children, large for size and increased intra-abdominal pressure.

Variable	Primary Abdominal Closure (n=295)	Bogota-bag Technique (n=39)
<b>Sex</b>		
Male	157	19
Female	138	20
<b>Age (year)</b>	8.3 (0.5-17)	2 (0.3-10)
<b>Recipient weight (kg)</b>	26.3 (6-80)	7.93 (4-22)
<b>Graft weight (g)</b>	410 (175-956)	435 (210-1054)
<b>Graft type</b>		
Right lobe	2	0
Left lobe	99	1
Left lateral lobe	178	35
Whole	16	3
<b>Main indication</b>		
Biliary atresia	148	21
Metabolic disease	51	11
Acute failure	27	4
Other	69	3
<b>Hospital stay (day)</b>	21 (7-49)	24 (8-65)
<b>Exitus</b>	14	6

019

## Endovascular Treatment of Active Bleeding After Pediatric Liver Transplantation

**Ozgur Ozen<sup>1</sup>, Fatih Boyvat<sup>1</sup>, Ali Harman<sup>1</sup>, Emre Karakaya<sup>2</sup>, Ebru H. Ayvazoglu Soy<sup>2</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>Department of Radiology, Baskent University School of Medicine, Ankara, Turkey

<sup>2</sup>Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey

**Introduction:** Transcatheter arterial embolisation (TAE) has been used for many years to effectively control active haemorrhage at different anatomical locations. Hematomas can suddenly deteriorate and become life-threatening for transplant patients. Hematomas following transplantation requires prompt diagnosis and intervention rather than conservative management. The purpose of this study was to evaluate the performance of computed tomography (CT) in the treatment planning and to report the effectiveness of transcatheter embolization for the management of hematomas in pediatric liver transplant patients.

**Materials and Methods:** The first liver transplant (LT) in 1988 was performed by our team. Since 1988 we performed 700 liver transplant. Of these liver transplants 334 were pediatric and 366 were adults. Mean age of 7.34 years (0.5 months – 17 years). Nineteen (5.7%) of the LT were deceased donor LT and 315 (94.3%) were living donor liver transplant. Most cause of liver failure was biliary atresia (n=169). Mean weight of recipients was 23.3 kg (4-80 kg). Most of graft types was left lateral graft (n=204). Between June 2012 and December 2021, 10 pediatric liver transplant patients referred to the interventional radiology unit for interventions. 6 patients with active bleeding were treated via endovascular techniques. Computed tomography and angiograms were reviewed for the location of the hematoma and presence of extravasation. The correlation of CT and angiography findings and technical and clinical success of the endovascular interventions were analyzed.

**Results:** Active leak of contrast material during arterial phase was detected on 9/10 CT scans. Although there was no active bleeding on CT in 1 patient, active arterial bleeding was detected on angiography. On the contrary, in 2 patients, although active bleeding was observed on CT, active bleeding could not be detected on angiography. Source of bleeding was superior mesenteric artery branches in 4, hepatic artery branch in 2, superior epigastric artery in 1, and phrenic artery in 1 patient. 6 of 8 patients with active bleeding on angiography were treated with endovascular procedures. One patient who bled to the liver cut surface originating from a hepatic artery branch, was treated by open surgery because the bleeding branch was too thin for catheterization. One patient was decided to be treated surgically because patient was hemodynamically unstable and selective catheterization of the internal mammary artery would take time. Embolization procedures were performed with N-Butyl 2-Cyanoacrylate (NBCA) diluted with iodized oil in 2 patients, coils and NBCA with iodized oil in 1 patient. Embolization with coils was performed in 3 patients. Of 8 patients with active bleeding on angiography, 6 were successfully treated with endovascular methods and 2 with surgical methods. The success rate of transcatheter arterial embolisation was found to be 75%. We did not experience any complications related to the patients' comorbidities or the embolization procedure such as mistarget embolization, reflux of glue to the another innocent vessels or catheter adherence. Except 1 patient, CT detected bleeding source correctly in all treated patients. None of the patients died due to a progression of the hematoma.

**Conclusion:** TAE is an effective and safe treatment modality for pediatric liver transplant patients who has hematomas. CT is valuable in identifying the bleeding source and its anatomical relationships, may enhance our intervention abilities to become quicker, more effective and more secured.

020

## Immunological Aspects of the Cytomegalovirus Infections After Pediatric Liver Transplantation

Nazira Yerimova<sup>1</sup>, Shirtayev Bakhytzhana<sup>1</sup>, Baimakhanov Bolatbek<sup>2</sup>, Chormanov Almat<sup>2</sup>, Aruzhan Akhbetova<sup>1</sup>

<sup>1</sup>National Scientific Center of Surgery named after A.N. Syzganov, Department of Pediatric Surgery, Republic of Kazakhstan

<sup>2</sup>National Scientific Center of Surgery named after A.N. Syzganov, Department of Hepatobiliary Surgery and Liver, Republic of Kazakhstan

**Introduction:** The cytomegalovirus (CMV) is one of the most frequent virus agents having an influence on the results of hepatic transplantation. The cytomegalovirus (CMV) is widespread both among the patients in the condition of long-term medicamentous prophylactic suppression and among the population in general (60-100%). It is the main risk that can cause the loss of the transplant and the death of the patient after fulfillment of the hepatic transplantation. Decrease in the quantity of similar complications by means of various methods of prevention was demonstrated in the two meta-researches. According to the information received, HCMV develops within the first year after hepatic transplantation fulfillment without use of preventive antiviral preparations approximately in 44–65% of the cases.

**Materials and Methods:** Thirty (30) surgery operations on pediatric hepatic transplantation have been fulfilled since March, 2016 with use of the materials taken from live kin donors. The age of the patients: 6 months - 8 years old, as follows: 23 (76.6%) patients - *Biliary Atresia*; 2 (6.9%) patients - *Hepatic Cirrhosis* in the outcome of autoimmune hepatitis; 1 (3.3%) patient - *Primary Hyperoxaluria*; 1 (3.3%) patient - *Cholangiocarcinoma*; 1 (3.3%) patient - *Inoperable Hepatoblastoma*; 1 (3.3%) *Hepatic Cirrhosis* in the outcome of *Viral Hepatitis «C»* against the background of langerhans cell histiocytosis. The number of the female infants - 17 (56.7%) patients and the male infants - 13 (43.3%) patients.

**Results:** All the patients with the positive *quantitatives PCR* took *Cytomegalovirus immunoglobulin* 3-5 before the operations. The left lateral sector was transplanted to the 23 (76.6%) patients with biliary atresia from their CMV seropositive kin intravital donor (D+/R+) and the 4 (23.3%) patients - from their CMV seronegative donors (D-/R+). The total number of the seropositive donors (D+/R+) - 26 ones (86.6%). The total number of the seronegative donors (D-/R+) - 4 ones (13.4%). One *Simultaneous Liver-Kidney Transplantation* was fulfilled for one infant patient. All the patients with biliary atresia had CMV infection. Eight (8) patients had an active form of the disease. The follow-up period: 14 days - 3 years after transplantation. The ternary phylactic suppression therapy was fulfilled after each operation - *Prednisolone*, *Cell- Cept*, *Tacrolimus*. Activation took place in 3 (12%) patients with a not active form of CMV. The neurologic symptoms were in progress in 2 patients. The active CMV form in 1 patient was connected with the toxic effect of the fulfilled phylactic suppression therapy (*Tacrolimus*). The preparation had to be discontinued temporarily to stop the intoxication and the conservative methods and preparations were prescribed for the patient. All the patients with CMV infection took antiviral therapy with the preparation *Valganciclovir* (18 mg/kg) for a month and the viral load was decreased in the patients with the active form of CMV. Six (6) months later the *quantitatives PCR* for CMV became negative in all the patients. Nine (9) months later the viral load increased in 1 (3.3%) patient with the not active form of CMV. Twelve (12) months later *Viremia* was diagnosed in 6 (20%) patients and they were prescribed the antiviral therapy during the period of 3-6 months with *Valganciclovir*. Decreasing the total number of T-lymphocytes and T-helpers was registered against the background of phylactic suppression therapy and viremia (8 patients).

The imbalance was revealed in the content of the main subpopulations of T-lymphocytes ( $CD3+CD4+/CD3+CD8+ = 1:65$ ) and activation was increased ( $CD3+CD25+ = \pm 8.59\%$ ) in 50% of the patients against the background of the decreased total number of T-lymphocytes ( $CD3+CD4+ = 30.34\%$  and  $CD3+CD8+ = \pm 18.3\%$ ) of the main subpopulations of T-lymphocytes ( $CD3+CD4+ = \pm 18.3\%$ ). The insignificant proliferation of B-lymphocytes (30-44%) was marked as well. The cause of the revealed changes in the cellular level may be the immunodeficiency induced with the presence of a center of not-acute inflammatory process. Three (37.5%) patients had the following level of lymphocytes:  $CD3+ = \pm 60.39\%$ . The expressed imbalance in the main subpopulations of T-lymphocytes was revealed as well: ( $CD3+CD4+/CD3+CD8+ = \pm 0.99$ ). It was conditioned with decreasing the content of the helper subpopulation of T-lymphocytes ( $CD3+CD4+ = \pm 30.59\%$ ). The level of the lymphocytes of the late activation was increased - ( $CD3+HLA-DR+ = \pm 9.29\%$ ) as well as the level of the T-NK cells - ( $CD3+CD(16+56)+ = 7.15\%$ ). The content of the B-lymphocytes ( $CD19+ = 24.73\%$ ) and NK-cells ( $CD3-CD(16+56)+ = \pm 13.87\%$ ) was within normal range. The expressed immune imbalance was marked because of using the phylactic suppression therapy and presence of a CMV-disease or *CMV Viremia*. The higher the concentration of the phylactic suppression therapy was, the higher the CMV-titres in the blood became. The following serological researches were fulfilled for all the patients: Definition of the IgM and IgG antibodies both with the CMV methods and the methods of Enzyme Immunoassay as well as the definition of DNA of CMV in the blood and Liver Biopsy Slide with the method of PCR. The positive result of any abovementioned tests (the antibodies IgM and IgG with low avidity, the DNA of CMV in the blood and in the tissues and also specific inclusions in the LBSs) was considered as a case of a CMV-infection.

**Conclusions:**

1. The main prophylaxis of the CMV infection has to become the combination of the monitoring of the activity of the infection process with a long-term medicamental prophylaxis and treatment of all the episodes of the active CMVI.
2. Prescribing the pulse-therapy in case of rejection of the hepatic transplant it is necessary to take into account the character of the running of CMVI and apply the antiviral prophylaxis with *Valganciclovir* or *Ganciclovir* as needed as well as to fulfill all the necessary researches of the CMV activity in the plasma of the blood with PCR method.
3. It is recommended to prescribe a double medical dosage of *Ganciclovir*, *Valganciclovir* and human normal immunoglobulin, immunoglobulin against CMV and also decrease of the level of medicamentous phylactic suppression or its temporary cancellation in case of resistance of CMVI to basic therapy.
4. The liver recipients may be used the abovementioned immunoglobulins to correct the immune imbalance taking into account the immunodeficient condition caused with the phylactic suppression therapy.



**O21****Salvage Liver Transplantation in the Treatment of a Child with Local Recurrence of Hepatoblastoma: A Case Report**

**Ersin Gumus<sup>1</sup>, Hayriye Hizarcioglu Gulsen<sup>1</sup>, Hasan Ozen<sup>1</sup>, Diclehan Orhan<sup>2</sup>, Ali Varan<sup>3</sup>, Ahmet Bulent Dogrul<sup>4</sup>**

<sup>1</sup>Hacettepe University Faculty of Medicine, Department of Pediatric Gastroenterology, Ankara, Turkey

<sup>2</sup>Hacettepe University Faculty of Medicine, Department of Pediatric Pathology, Ankara, Turkey

<sup>3</sup>Hacettepe University Faculty of Medicine, Department of Pediatric Oncology, Ankara, Turkey

<sup>4</sup>Hacettepe University Faculty of Medicine, Department of General Surgery, Ankara, Turkey

**Introduction:** Hepatoblastoma (HBL) is the most common primary liver cancer of childhood, accounting for two-thirds of primary malignant hepatic neoplasms in this population. Radical surgical removal combined with efficient chemotherapy is essential for the cure of HBL. Complete tumor resection is of critical importance for achieving long-term survival. HBL may recur as isolated local disease. Based on SIOPEL (International Childhood Liver Tumor Strategy Group), local (intra-hepatic) recurrence of HBL after liver resection is amongst the indications of liver transplantation in HBL patients. Here, we present a patient who underwent salvage liver transplantation for the treatment of local recurrence of HBL.

**Case presentation:** A 13-year-old boy who was diagnosed with hepatocellular carcinoma arising from left liver lobe and treated with a left hemihepatectomy to achieve complete tumor resection, was admitted to our outpatient oncology clinic for further evaluation as alpha-fetoprotein (AFP) levels started to increase following a dramatic decrease after tumor resection. Medical records of the patient revealed that AFP was >80.000 µg/L at diagnosis and decreased to 576 µg/L before increasing again. Histopathological re-examination of hemihepatectomy material in our institution showed a histological aspect of an epithelial fetal hepatoblastoma rather than hepatocellular carcinoma. The patient underwent an MRI exam, which showed multifocal lesions in the right liver lobe compatible with local recurrence of the primary malignant tumor. He was treated with SOPEL 3 study high risk hepatoblastoma protocol including cisplatin alternated carboplatin and doxorubicin. Favorable initial response to chemotherapy has been obtained by normalized AFP levels and regression of hepatic lesions. After completing chemotherapy regimen, tumor showed progression with multifocal lesions in the right liver lobe with increased AFP levels. <sup>18</sup>F-FDG PET-CT revealed a normal FDG activity without any sign of metabolically active disease. The patient immediately underwent a comprehensive transplant evaluation by pediatric transplant team including specialists in hepatology, oncology, radiology, and transplant surgery. Following the evaluation, the patient was deemed a viable candidate for an urgent liver transplantation. The patient received CDDP+FU chemotherapy in the meantime until a suitable donor was found. The patient underwent right lobe living donor liver transplantation without any immediate and short-term complications. Epithelial fetal type hepatoblastoma was confirmed with histopathological evaluation of the liver explant. Seven months post-transplant, he has excellent graft function without any complications or sign of malignancy. The patient is being followed closely regarding graft function and recurrence of HBL following liver transplantation.

**Conclusion:** The use of liver transplantation in the treatment of children with hepatoblastoma has been increasing. Beside primary liver transplantation for unresectable tumors by conventional surgery, salvage liver transplantation is an important treatment option for patients with local recurrence of HBL. However, liver transplantation in the salvage setting was reported to be associated with worse outcome when compared with its use in primary treatment.

**O22****Clinical Features and Outcomes Following SARS-Cov-2 Infection in Pediatric Liver Transplant Patients**

**Meraj Alam Siddiqui<sup>1</sup>, Oğuz Bakırcı<sup>1</sup>, Utku Dönger<sup>1</sup>, Khaled Warasnhe<sup>1</sup>, Figen Özçay<sup>2</sup>**

<sup>1</sup>*Department of Pediatrics, Başkent University Faculty of Medicine, Ankara, Turkey*

<sup>2</sup>*Department of Pediatric Gastroenterology, Başkent University Faculty of Medicine, Ankara, Turkey*

**Background:** Several studies suggest that chronic immunosuppressive treatment in pediatric liver transplant recipients may predispose to increased risk of acquiring SARS-CoV-19 infection, however, the severity of the infection and mortality rates remains unclear due to the lack of sufficient clinical data. Herein, we assessed the severity and clinical features following SARS-CoV-19 infection in our pediatric liver transplant recipient's cohort.

**Methods:** We assessed total of 118 pediatric liver transplant recipients between 1-18 years of age who had been followed between 01 March 2019 to December 2021 (SARS-CoV-19 era) at Başkent University Hospital, Ankara, Turkey. Demographic data, clinical and laboratory features were obtained from Başkent University Hospital's electronic medical record system as well as the state-owned centralized system (e-Nabiz). The information regarding the severity of the symptoms, length of hospitalization, and outcomes of the infection were obtained from the telephone inquiries. The patients were excluded if they had been diagnosed with COVID-19 infection before the liver transplantation, unknown hospitalization status and unconfirmed SARS-CoV-PCR tests. The demographic, clinical and laboratory features of the patients were analysed descriptively.

**Results:** A total of 16 out of 118 (13.5%) pediatric liver transplant recipients were diagnosed with COVID-19 infection. Eleven (68.8%) patients were male with a median age of 14.8 (interquartile range, 8-16) years. The main presenting symptoms were as follows; fever in 8 (50%), cough in 6 (37.5%), sore throat in 4 (25%), runny nose in 5 (31.3%), myalgia in 3 (18.8%), and abdominal pain in 2 (12.5%) patients. None of the patients exhibited respiratory failure, arthralgia, smell and taste loss, or diarrhea. Detailed epidemiological and clinical features are presented in Table 1. Out of 16 COVID-19 patients, 6 (37.5%) had complete blood count, biochemistry tests and coagulation profile. Four of them exhibited leukopenia and mildly elevated C-reactive protein. One patient required computed tomography of thorax due to respiratory distress which revealed the ground-glass opacity and minimal pleural effusion. Only 3 out of 16 patients required hospitalization with a mean 2.67-days length of stay. Two out of 16 patients received favipiravir and two patients required antibiotics treatment due to suspected pneumonia. No SARS-CoV-19 infection associated intensive care admission or death were observed in our study.

Nine out of 16 patients with SARS-CoV-19 were unvaccinated due to following reasons: 8 patients were younger than 12 years (vaccine does not recommend in this age group by the current guidelines of Turkish Ministry of Health), and 1 patient was recently tested positive for COVID-19 infection. Rest seven out of 16 patients had two doses of COVID-19 vaccination.

**Conclusion:** In this study, pediatric LT patients with SARS-CoV-19 infection showed a wide range of clinical presentations while the outcomes of the infection were generally mild.

**Table 1.** Epidemiologic and Clinical Characteristics of Covid-19 Infection in Pediatric Liver Transplant Recipients

Categorical variables	SARS-CoV-2 (n=16, %)
Sex - no. (%)	
Male	11 (68.8)
Female	5 (31.3)
Age - median [IQR] - no. (%)	14.8 y (8 - 16)
Symptom	
Fever - no. (%)	8 (50)
Cough - no. (%)	6 (37.5)
Sore throat - no. (%)	4 (25)
Runny nose - no. (%)	5 (31.3)
Myalgia - no. (%)	3 (18.8)
Headache - no. (%)	26 (12.6)
Abdominal pain - no. (%)	2 (12.5)
Arthralgia - no. (%)	1 (6.3)
Vomiting - no. (%)	1 (6.3)
Anosmia - no. (%)	1 (6.3)
Congested nose - no. (%)	1 (6.3)
Vaccination	
Unvaccinated - no. (%)	9 (56.3)
Vaccinated - no. (%)	7 (43.8)
Sinovac-CoronaVac - no. (%)	3 (18.3)
BioNtech - no. (%)	4 (25.1)

\* Percentages may not be total 100 because of rounding.

**O23**

## Vascular Complications in Pediatric Liver Transplants and Their Management

**Emre Karakaya<sup>1</sup>, Aydıncan Akdur<sup>1</sup>, Ebru Ayvazoğlu Soy<sup>1</sup>, Fatih Boyvat<sup>2</sup>, Gökhan Moray<sup>1</sup>, Mehmet Haberal<sup>1</sup>**

<sup>1</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of Radiology, Ankara, Turkey

**Introduction:** Unlike other organs, the blood supply of the liver occurs through two systems. One of these is the hepatic artery, and it supply approximately one-third to one-fifth of the liver. The rest of the liver is supplied with blood via the portal vein. The outflow of blood circulation in the liver is via the hepatic veins. Any disruption in this blood circulation results in deterioration in liver functions. In this study, we aimed to evaluate early vascular complications in pediatric liver transplants.

**Methods:** From 8 November 1988 to 31 December 2021, we performed 701 LT procedures and 334 of them were pediatric. We reviewed the medical records of these recipients for the following: primary cause of liver failure, age, and weight at the time of transplantation, type of graft, vascular complications and their management. One hundred and seventy-six of the recipients were male and 158 were female. Mean age of 7.34 years (0.5 months – 17 years). Nineteen (5.7%) of the LT were deceased donor LT and 315 (94.3%) were living related liver transplant. Most cause of liver failure was biliary atresia (n=169). Mean weight of recipients was 23.3 kg. Most of graft types was left lateral graft (n=204).

**Results:** Hepatic vein complications occurred in 3 patients. In all three patients, stenosis was detected in the portal vein anastomosis region and was successfully treated with interventional radiological methods by placing a stent in the anastomosis region. Portal vein complications occurred in 3 patients. In one of these patients, hemostasis was performed by surgical method due to bleeding from the portal vein anastomosis. In the second patient, the anastomosis was surgically revised due to thrombus formation in the portal vein. In the third patient, due to a stenosis of more than 50% in the portal vein anastomosis, a stent was placed in the anastomosis region after balloon dilation using interventional radiological methods, and blood flow was successfully maintained. Hepatic artery complications occurred in 54 patients. Hepatic artery thrombosis occurred in 31 patients, hepatic artery stenosis in 13 patients, bleeding from hepatic artery anastomosis in 7 patients, hepatic artery dissection in 2 patients, and pseudoaneurysm in the hepatic artery in 1 patient. 43 of these patients were successfully treated with interventional radiological methods and 11 of them surgically.

**Conclusion:** Vascular complications seen in liver transplants can cause deterioration in hepatic functions and acute liver failure. Especially hepatic artery complications are one of the most important causes of biliary tract complications that will develop in the future. Vascular complications can be successfully treated at an early stage in experienced organ transplant centers.

**O24****The Role of Interventional Radiology in the Management of Early Vascular Complications After Pediatric Liver Transplantation**

**Behlül İgüs<sup>1</sup>, Fatih Boyvat<sup>1</sup>, Aydınca Akdur<sup>2</sup>, Özgür Özen<sup>1</sup>, Emre Karakaya<sup>2</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>Department of Radiology, Baskent University School of Medicine, Ankara, Turkey

<sup>2</sup>Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey

**Purpose:** Evaluation of the efficacy and safety of percutaneous treatment of early vascular stenosis and occlusions in pediatric liver transplant recipients.

**Materials and Methods:** The first liver transplant (LT) in 1988 was performed by our team. Since 1988 we performed 700 liver transplant. Of these liver transplants 334 were pediatric and 366 were adults. Mean age of 7.34 years (0.5 months – 17 years). Nineteen (5.7%) of the LT were deceased donor LT and 315 (94.3%) were living donor liver transplant. Most cause of liver failure was biliary atresia (n=169). Mean weight of recipients was 23.3 kg (4-80 kg). Most of graft types was left lateral graft (n=204). Twelve children (mean age 5.4 years (4 months-15 years) underwent interventional procedures for early (0-7 days post-transplant period) vascular complications after liver transplantation. Patients had stenosis of portal veins (n =2 ), stenosis of hepatic vein (n = 1), stenosis of inferior vena cava (n=1) or stenosis or occlusion of hepatic arteries (n = 8). Technical and clinical success rates were evaluated.

**Results:** Ten patients had an arterial complication which was consisted of 7 HAT and 3 HAS. For patients with hepatic artery thrombosis, selective intra-arterial thrombolysis (0,25-0,75mg/hr) was performed through the catheter. Five of the seven patients were treated with thrombolytic treatment and balloon angioplasty. Three patients required stent insertion due to re- occlusion after EVT on the first day, three months, and eight months, respectively. One patient required stent insertion after the thrombolytic treatment. One patient required revision surgery after the tPa infusion due to excessive arterial kinking Three patients with HAS have been treated, 2 of them balloon angioplasty and one with stent insertion. A total of four biliary complications were observed. Portal vein interventions were performed by transhepatic puncture in the first day of transplantation. Primary stent was placed and balloon angioplasty also performed. Stent was placed after unsatisfactory angioplasty in IVC stenosis and balloon angioplasty to hepatic vein stenosis.

**Conclusion:** Interventional radiology allows effective and safe treatment of vascular stenosis or occlusion after pediatric liver transplantation. Early diagnosis is important to treat the patients as soon as possible. The variety, the characteristics, and the individuality of interventional management of all kinds of possible vascular stenosis or occlusions after pediatric liver transplantation are shown.

**O25****Pediatric Liver Transplantation Indications and Outcomes in Glycogen Storage Disease: A Single Center Experience**

**Hazel Delal Dara Kar<sup>1</sup>, Khaled Warasne<sup>1</sup>, Figen Özçay<sup>2</sup>, Halil İbrahim Aydın<sup>3</sup>,  
Aydıncan Akdur<sup>4</sup>, Mehmet Haberal<sup>4</sup>**

<sup>1</sup>Department of Pediatrics, Başkent University Faculty of Medicine, Ankara, Turkey

<sup>2</sup>Department of Pediatric Gastroenterology, Başkent University Faculty of Medicine, Ankara, Turkey

<sup>3</sup>Department of Pediatric Metabolic Diseases, Başkent University Faculty of Medicine, Ankara, Turkey

<sup>4</sup>Department of General Surgery, Division of Transplantation, Başkent University Faculty of Medicine, Ankara, Turkey

**Introduction:** Glycogen storage diseases (GSDs) are inherited metabolic disorders result from impaired glycogen storage, glycogen or glucose breakdown. Liver transplantation is considered as a treatment option for patients with glycogen storage diseases present with hepatic malignancy, liver failure or metabolic decompensation. Glycogen storage disease type 1a is associated with impaired glucose homeostasis due mutations in the glucose-6-transporter/glucose-6-phosphatase complex while glycogen storage disease type 9 results from phosphorylase kinase deficiency, an enzyme necessary for glycogen breakdown. Herein, we present our experience and transplantation outcomes in 7 pediatric patients with GSD who underwent liver transplantation.

**Results:** Liver transplantation was performed in 6 patients with GSD type 1a and one patient with GSD type 9. Four patients had a family history of consanguinity (3 patients 1<sup>st</sup> degree, 1 patient 2<sup>nd</sup> degree). Mean age of diagnosis was 7.28 (1-24) months. Mean age of liver transplantation was 128.5 (13-216) months. Transplantation indications were hepatic adenoma (4/7), poor metabolic control (4/7) and cirrhosis (1/7). Extra-hepatic findings included proteinuria (4/7), Focal segmental glomerulosclerosis (1/7), proximal tubulopathy (4/7), nephrolithiasis (2/7), hyperlipidemia (7/7), delayed puberty (3/7), hypertension (2/7), short stature (6/7), epilepsy (2/7) and osteoporosis (4/7). One patient with GSD1a underwent cataract surgery. Three patients with GSD1a incidentally had the same G6PC gene mutations (c.247C>T). Three patients had normal cognitive functions and development (WISC-R Test). Two patients had mild where one patient had moderate mental retardation. One patient had %30 developmental delay (AGTE Test).

Six patients underwent LT from living-related donors while one patient had cadaveric donor. Patients who underwent LT from live donors received left lateral segment. Explant liver pathology revealed variable numbers (1-12) of hepatic adenoma in 4 patients. Hepatocellular carcinoma (HCC) was detected in one patient. Serum lactate, uric acid and triglyceride levels normalized after LT. Tubulopathy resolved in one patient while epilepsy continued in two patients. Height SD scores were improved in 4 patients while remained unchanged in one patient after 5-year follow up.

Acute graft rejection was detected in 4 patients. Mean follow up time was 80 (3-183) months. All patients are still alive and routinely followed up at our department.

**Conclusion:** Liver transplantation improved the quality of life in our GSD patients with metabolic decompensation and severe disease manifestations. Biochemical parameters (lactate, uric acid and triglyceride levels) normalized after transplantation. Our patients displayed improved height growth. LT should be considered in GSD patients with poor metabolic control despite dietary management, hepatic malignancy or progressive liver failure.



**O26****Long-Term Outcomes of Patients with Progressive Familial Intrahepatic Cholestasis After Biliary Diversion**

**Hakan Öztürk<sup>1</sup>, Sinan Sarı<sup>1</sup>, Hakan Sözen<sup>2</sup>, Ödül Eğirtaş Gürkan<sup>1</sup>, Buket Dalgıç<sup>1</sup>, Aydın Dalgıç<sup>2</sup>**

<sup>1</sup>Gazi University Faculty of Medicine, Department of Pediatric Gastroenterology, Ankara, Turkey

<sup>2</sup>Hacettepe University Faculty of Medicine, Transplantation Center, Ankara, Turkey

**Introduction:** Surgical techniques such as biliary diversion to reduce enterohepatic circulation are performed in the treatment of PFIC (progressive familial intrahepatic cholestasis). We aimed to evaluate the outcomes of the patients with PFIC who underwent biliary diversion in our center.

**Methods:** The medical records of 9 patients who underwent biliary diversion between January 2007 and February 2020 were reviewed retrospectively.

**Results:** Eight partial external biliary diversion (PEBD) and one internal diversion surgery were performed in two PFIC 1, six PFIC 2 and one PFIC 3 cases. One patient required PEBD after liver transplantation because of diarrhea and hepatosteatorosis. Five of the patients were girls and 4 were boys. The mean age of diversion surgery was 4.6 years. There was no need for transplantation in five patients during the mean follow-up of 9 years after diversion. In 2 of these 5 cases, the complaints of itching and diarrhea completely recovered, and in 3 cases, the itching continued. One of the three patients was performed internal diversion and switch to PEBD is planned because of the unresponsiveness to the surgery. Liver transplantation was planned for the other patient. The other case, which itching has decreased, is being followed. Liver transplantation was performed in three patients a mean of 4.6 years after diversion.

**Conclusion:** Biliary diversion is a very useful option in PFIC cases with medical treatment-resistant itching and diarrhea. Biliary diversion may eliminate or delay the need for liver transplantation in patients with PFIC. PEBD may be required after liver transplantation in patients with PFIC 1.

**O27****Progressive Familial Intrahepatic Type-1 Case with Partial External Biliary Diversion After Liver Transplantation**

**Demet Teker Düztaş<sup>1</sup>, Sinan Sarı<sup>1</sup>, Ödül Eğritaş Gürkan<sup>1</sup>, Mustafa Hakan Sözen<sup>2</sup>, Buket Dalgıç<sup>1</sup>, Aydın Dalgıç<sup>2</sup>**

<sup>1</sup>*Gazi University Faculty of Medicine, Division of Pediatric Gastroenterology, Ankara, Turkey*

<sup>2</sup>*Gazi University Faculty of Medicine, Division of General Surgery, Ankara, Turkey*

**Introduction:** In patients with progressive familial intrahepatic cholestasis-1 (PFIC1) who have had a liver transplant, severe diarrhea after surgery is one of the major variables determining morbidity and mortality. We present a case of PFIC1 with refractory diarrhea and malnutrition who improved with partial external biliary diversion (PEBD) after liver transplantation.

**Case Report:** A one-month-old female patient was diagnosed with PFIC1 with neonatal cholestasis with low GGT. In the follow-up, resistant watery diarrhea and growth retardation were added to the clinical findings. Owing to severe itching that disrupted sleep patterns, refractory diarrhea, and severe malnutrition (Weight z score: -3.47), PEBD was planned at the age of two years, but the family rejected it due to cosmetic concerns. At the age of three, liver transplantation from a cadaver was performed due to chronic liver disease. From the first month after surgery, her watery diarrhea worsened, causing episodes of dehydration and metabolic acidosis, which required recurrent hospitalizations. Although synthesis functions improved, transaminase levels remained 2-3 times higher than normal. Except for severe adiposity and minimal inflammation, no other histopathological factor was found to cause elevated transaminases. After the regression of diarrhea with percutaneous biliary drainage at the postoperative 19th month, PEBD was performed due to growth retardation (weight z score: -4.51), persistent diarrhea and fatty liver. Although there was no significant regression in transaminase levels after PEBD, it was observed that diarrhea improved and the weight z-score began to increase (z score: -3.4 at 1 year after diversion surgery).

**Conclusion:** PFIC1 is an autosomal recessive disease caused by mutations in the ATP8B1 gene encoding P-type ATPase (FIC1). FIC1 is presented in the apical membrane of the cholangiocyte, enterocytes, and acinar cells of the pancreas. Chronic Liver disease may also be accompanied by persistent diarrhea and pancreatitis. PEBD is the first treatment option in patients without end-stage liver disease. In patients who develop advanced fibrosis and lose the chance of PEBD, liver transplantation improves the cholangiocytes level and increases bile salt flow into the intestine. However, as the problem in enterocytes continues, bile salt malabsorption is exacerbated. It causes persistent diarrhea and severe malnutrition. This is thought to be the main cause of post-transplant graft steatosis. Therefore, PFIC1 patients with persistent diarrhea after liver transplantation may need PEBD to prevent graft damage and malnutrition.

**Keywords:** PEBD, transplantation, PFIC-1

**Table 1.** Clinical and laboratory findings of the patient before and after partial external biliary diversion (PEBD)

Patient	Initial time	Pretransplantation	1 year after from transplantation	Pre-PEBD	After 1 year from PEBD
<b>Weight (g)/z score</b>	4220 / 1,1	9900 / -3,47	8600/- 5,64	10300/ -4,51	13000 / -3,4
<b>Height (cm)/z score</b>	58 / -0,54	83.5 / -2,92	97/ -1,19	99.5 /-1,11	102 / -2,1
<b>AST (U/L)</b>	247	70	102	82	98
<b>ALT (U/L)</b>	301	51	56	62	87
<b>GGT (U/L)</b>	21	26	30	23	57
<b>Total bilirubin/Direct bilirubin (mg/dL)</b>	16.978.7	7.28/4.58	0.3/0.1	0.39/0.12	1.06/0.28
<b>Albumin (g/dL)</b>	3.49	3.8	3.8	3.7	4.1
<b>INR</b>	0.82	1.01	1.06	0.95	0.94
<b>İcter</b>	+++	+++	None	None	None
<b>Acholic stool</b>	+	+	None	none	None
<b>Stool frequency-consistency</b>	1-2 times, normal stool	8-9 times, watery stool	5-6 times, watery stool	9-12 times, watery stool	1-2 times, normal stool
<b>İchting</b>	none	+++	None	none	None

## O28

## Development of Liver Transplantation in Georgia

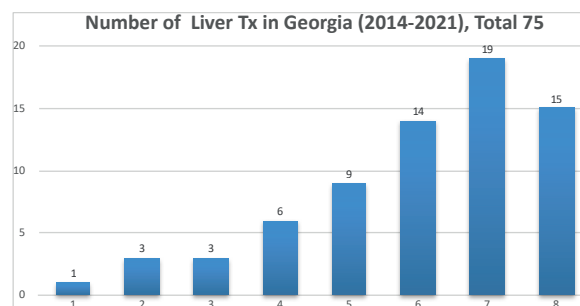
K. Kashbadze

*General Surgery, Evex Hospital, Georgia*

**Background:** Liver transplantation remains to this day as the best mean of radical treatment of terminal liver disease and hepatocellular carcinoma. Among them, living donor liver transplantation is the most difficult method, both technically and parametrically. First kidney transplantation in Georgia was performed in 1972, but it had a sporadic character. To date, only living donor kidney and liver transplantations are performed in Georgia.

**Materials and Methods:** On December 14, 2014, the first living donor right-sided liver transplantation was performed. The operation was successful and the patient continues to perform social activities with a good quality of life and clinical-laboratory values. From 2014 until today, 92 liver transplantations have been performed in two clinical centers in Tbilisi and Batumi. Among them, we will discuss the possibilities of the field on the example of the center in Batumi, where the majority (70) of the transplantations has been done.

**Review and Analysis:** The first transplantation was performed in Batumi in EVEX Referral Hospital in 2014. As we can see on the diagram, the dynamics of the performed operations is increasing, but due to the lack of financial support and absence of cadaver donation, its increase to the desired numbers remains problematic at this stage.



The first liver transplantation in a child was performed in 2017 and to date total of 7 have been performed, due to wilson's disease, congenital biliary atresia and budd-chiari syndrome. In 8 cases, both in children and adults, left lobe graft was used. In 2020, the first successful retransplantation was performed on the patient, who previously underwent transplantation in our center, because of the late stage rejection of graft after 1.5 years. Currently 12 patients have passed away, from which: 3- within first 2 months after the transplantation, 2- within 1 year, 4- within 3 years and 3- after 3 years. One of them was due to cardiac reasons, two cases with acute infections, 8 cases with chronic infections and 1 case with Covid-19 infection. Of course the statistics will not be precise, but survival rates are 83%, which at this stage of development is a satisfactory result.

**Conclusion:** Discussion and interpretation of clinical outcomes demonstrates the need for further development of transplantation, where cadaveric donation and a better support programs from state will be a new important factor in both quantitative growth and consequent improvement.

**029**

## Our Pediatric Liver and Kidney Transplant Activities in 2021

**Emre Karakaya, Aydınca Akdur, Ebru Ayvazoğlu Soy, Gökhan Moray, Sedat Yıldırım, Mehmet Haberal**

*Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey*

**Introduction:** In children with end-stage renal disease, chronic liver failure or acute liver failure, liver (LT) and kidney transplant (KT) is the most effective modality leading to better clinical outcomes compared to other medical or replacement therapies. On the other hand, since solid organ transplantation in children may cause complications at a higher rate, it should only be performed in centers with experience and multidisciplinary expertise. In this study we aimed to assess our LT and KT activities in 2021.

**Materials and Methods:** Between 3 November 1975 and 31 December 2021 we have performed 701 LT and 3290 KT. 382 of these KT and 334 of these LT were pediatric. On March 15, 1990, the first living donor pediatric liver transplant was performed by our team in Turkey, Europe and the region. Between 01 January 2021 and 31 December 2021 we performed 21 LT and 114 KT. 19 of the LT and 12 of the KT we performed in 2021 were pediatric. We recorded age, gender, body mass index (BMI), comorbidities, etiologies, laboratory values and clinical outcomes of the recipients.

**Results:** Between 01 January 2021 and 31 December 2021 we performed 19 pediatric LT and 12 pediatric KT. The mean age of the LT recipients was 3.4 years. Eight of these recipients were male. The most common etiology was biliary atresia (n=7). All of LT's were living related liver transplant and all recipients were relatives with their donors. The mean length of hospital stay was 17.6 days. Except 2 patients all recipients discharged successfully. 2 LT patients died in the early postoperative period due to sepsis.

The mean age of the KT recipients was 14.1 years. Four of these recipients were male. The most common etiology was vesicoureteral reflux (n=3). Except one, all of KT's were living related kidney transplant and all recipients were relatives with their donors. The mean length of hospital stay was 4.3 days. All recipients discharged successfully.

**Conclusion:** Although transplant procedures for young children are more complex, they can be performed successfully in experienced transplant centers.

## O30

**Relationship Between Postoperative Acute Kidney Injury and Early Extubation After Pediatric Liver Transplantation**

**Helin Şahintürk<sup>1</sup>, Buğra Aykenar<sup>1</sup>, Ahmed Uslu<sup>1</sup>, Zeynep Ersoy<sup>1</sup>, Fatma İrem Yeşiler<sup>1</sup>, Pınar Zeyneloğlu<sup>1</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>Department of Anesthesiology and Critical Care, Başkent University Faculty Of Medicine, Ankara, Turkey

<sup>2</sup>Department of General Surgery, Division of Transplantation, Baskent University Faculty of Medicine, Ankara, Turkey

**Introduction:** Postoperative acute kidney injury (AKI) after pediatric liver transplantation (LT) is a serious complication with considerable short and long term consequences. Data on the incidence and risk factors for AKI among pediatric LT recipients are scarce. The association between mechanical ventilation and AKI have been reported among critically ill children. We hypothesized that incidence of postoperative AKI after pediatric LT is lower among those extubated early after surgery in the operating room (OR).

**Materials and Methods:** In this retrospective cohort study, the medical records of all patients aged <18 years undergoing LT from January 2012- December 2020 were reviewed. AKI was defined according to KDIGO (Kidney Disease Improving Global Outcomes) criteria. Children were divided into 2 groups; those who were extubated in the OR and those extubated later in the intensive care unit (ICU).

**Results:** A total of 132 pediatric LT recipients were analyzed. The mean age of transplantation was 58.2±60.1 (4-204) months and 72 (54.5%) were male. Postoperative AKI was seen in 24 (18.2%) children of which 15(11.4%) had AKI stage 1, 8(6.1%) stage 2, 1(0.8%) stage 3. Extubation in the OR was performed in 86 patients (65.2%). Children with or without extubated in the OR were similar in terms of demographic characteristics, preoperative and postoperative laboratory values. There was no statistically significant difference between two groups regarding development of AKI (19.5% vs 15.6%, p>0.05). Length of ICU and hospital stay were significantly shorter in children who were extubated in the OR (3.5±3.5 days vs 9.1±12.5 days, p<0.001; 23.1±15.9 days vs 35.4±19.4, respectively). There was no difference in 28-day mortality in both groups (p=0.3, 10.3% in those extubated in the OR, versus 15.6% in those extubated in the ICU).

**Conclusion:** Our pediatric LT recipients have 18.2% incidence of postoperative AKI and nearly 2/3 of them were extubated in the OR. There was no difference between 2 groups in terms of AKI. The need for mechanical ventilation after surgery was not associated with development of postoperative AKI. However, the length of ICU stay was significantly shorter in children who were extubated in the OR.



**O31****Macular Vessel Density Measurement in Pediatric Renal and Liver Transplantation**

**Almila Sarıgül Sezenöz<sup>1</sup>, Gökhan Tortumlu<sup>1</sup>, İmren Akkoyun<sup>1</sup>, Sibel Oto<sup>1</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>*Department of Ophthalmology, Baskent University School of Medicine, Ankara, Turkey*

<sup>2</sup>*Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey*

**Introduction:** Microcirculatory dysfunction is known to be associated with organ failure and increased mortality in transplantation patients. Non-invasive monitorization of retinal structures of the eye could be a predictor for systemic microvasculature in these patients. Therefore, in this study we aimed to evaluate the retinal microvascular changes in pediatric patients who had undergone liver or renal transplantation surgery, using optical coherence tomography angiography (OCT-A).

**Methods:** This cross-sectional study was performed at Başkent University. The medical records of pediatric patients who had liver or renal transplantation in the last 10 year were reviewed. The macular vessel density (VD) parameters were obtained by OCT-A (Avanti RTVue-XR). The results were compared with the age-, sex-, and spherical equivalent-matched healthy subjects. The IBM Statistics Package for the Social Sciences version 25.0 (SPSS ver. 25.0) statistics program was used for data analysis.

**Results:** 32 eyes of 16 liver transplantation patients and 20 eyes of 10 renal transplantation patients and 64 eyes of 32 healthy controls were included. Superficial macular whole image, superficial perifoveal and deep foveal VDs were found to be lower in liver transplantation group compared to healthy controls ( $p=0.02$ ;  $p=0.01$ ;  $p=0.01$  respectively). Superficial foveal, deep macular whole image, deep foveal and deep perifoveal VDs were found to be lower in renal transplantation group compared to healthy controls ( $p=0.03$ ;  $p=0.04$ ;  $p=0.01$ ;  $p=0.02$  respectively).

**Conclusion:** Macular VD measurements are affected in pediatric renal and liver transplantation patients. In those patients, retinal OCT and OCTA measurements may provide a non-invasive window to the microcirculation.

**O32****Peripapillary Vessel Density Measurement in Pediatric Renal and Liver Transplantation Patients**

**Gülşah Gökğöz<sup>1</sup>, Gökhan Tortumlu<sup>1</sup>, Sezin Akça Bayar<sup>1</sup>, Gürsel Yılmaz<sup>1</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>*Department of Ophthalmology, Baskent University School of Medicine, Ankara, Turkey*

<sup>2</sup>*Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey*

**Introduction:** Non-invasive monitorization of retinal structures of the eye could be a predictor for systemic microvasculature in transplantation patients. In this study our purpose was to determine the optic disc and peripapillary microvascular changes in pediatric patients who had undergone liver or renal transplantation surgery.

**Methods:** The study was performed at Başkent University. The medical records were reviewed and patients who had liver or renal transplantation in the last 10 years were recruited. Only patients younger than 18 years old were included. The optic and peripapillary vessel density (VD) parameters were obtained by OCT-A (Avanti RTVue-XR). The results were compared with the age-, sex-, and spherical equivalent-matched healthy subjects. The IBM Statistics Package for the Social Sciences version 25.0 (SPSS ver. 25.0) statistics program was used for data analysis.

**Results:** 32 eyes of 16 liver transplantation patients and 20 eyes of 10 renal transplantation patients and 64 eyes of 32 healthy controls were included. Whole image peripapillary, inside disc, peripapillary, superior and inferior hemisphere, superior, inferior, temporal and nasal quadrant peripapillary VDs were evaluated. No statistical significant difference in any parameters between healthy control and patient groups were noted.

**Conclusion:** Peripapillary VD measurements are not affected in pediatric renal and liver transplantation patients.

033

## A Fatal Complication of Liver Transplantation: Posttransplant Lymphoproliferative Disease

Hayriye Hizarcioglu Gulsen<sup>1</sup>, Ersin Gumus<sup>1</sup>, Hulya Demir<sup>1</sup>, İnci Nur Saltik Temizel<sup>1</sup>, Ali Varan<sup>2</sup>, Ahmet Bulent Dogrul<sup>1</sup>

<sup>1</sup>Hacettepe University Faculty of Medicine, Department of Pediatric Gastroenterology, Ankara, Turkey

<sup>2</sup>Hacettepe University Faculty of Medicine, Department of Pediatric Oncology, Ankara, Turkey

<sup>3</sup>Hacettepe University Faculty of Medicine, Department of General Surgery, Ankara, Turkey

**Introduction:** Post transplant lymphoproliferative disease (PTLD) is a potentially fatal complication after solid organ transplantation, which is highly associated with Epstein-Barr virus (EBV). PTLD has higher risk in EBV-naïve patients. Besides, it develops in EBV-seropositive transplant recipients. Here, we present a child who developed PTLD at 18<sup>th</sup> month of liver transplantation (LT) despite close follow-up for cytomegalovirus (CMV) and EBV.

**Case presentation:** A 20-months old boy with citrullinemia type 1 [ASS1 gene c.1168G>A (p.G390R)] was referred to LT due to frequent metabolic decompensations. Liver transplantation from his father was immediately performed due to sudden onset of hepatic encephalopathy. Recipient and the donor were CMV and EBV seropositive before LT. Steroid and tacrolimus were given besides anti-infectious prophylaxis. Subcapsular seroma that was determined on the 24<sup>th</sup> day resolved after percutaneous biliary drainage, and concomitant liver biopsy showed no positive staining for EBV and CMV or liver rejection. By 3<sup>rd</sup> month of LT, valganciclovir was stopped.

In the 4<sup>th</sup> month, mild rejection was controlled by steroid and mycophenolate mofetil (MMF) was added. In the 6<sup>th</sup> month, he was hospitalized due to vomiting. CMV viremia was determined. Intravenous ganciclovir and subsequently oral valganciclovir were given for 31 and 16 days, respectively. On the 32<sup>nd</sup> day of this hospitalization, fever and tachypnea occurred. He had prerenal azotemia, and elevated liver enzymes and tacrolimus levels. Abdominal computerized tomography (CT) showed pneumatosis along the colonic mucosa and edema of the small bowel wall. Besides antibiotherapy, parenteral nutrition was given for 14 days and then switched to amino acid formula. During the investigation of prolonged fever, EBV PCR level was 10000 copies/ml and acyclovir was added. His tacrolimus dosage was reduced and discharged home at 11 weeks of hospitalization with normal liver enzymes and tacrolimus level of 6.2 ng/mL. One month after discharge, due to 10 times increase of CMV viral load, intravenous ganciclovir was planned but valganciclovir could be provided and given for 3 months until CMV PCR got decreased.

In the 18<sup>th</sup> month of LT, the patient was admitted to emergency department due to vomiting, abdominal pain and cough. Reduced breath sounds on the left hemithorax and tachycardia were determined. Thorax CT showed a solid mass located in the upper front part of the mediastinum and reaching the left pericardiac area so that presses pulmonary conus, left pulmonary artery, left main bronchus and causing mild pericardial effusion. Hemogram, liver enzymes, albumin, venous blood gas, brain natriuretic peptide, alfa fetoprotein and beta-hCG levels were normal but CRP was high. Tacrolimus and MMF were stopped with a provisional diagnosis of PTLD. Steroid treatment was immediately started.

Tru-cut biopsy revealed high-grade B cell lymphoma. Due to the aggressive nature of the tumour, a chemotherapy protocol including COPADM (cyclophosphamide, vincristine, prednisone, adriamycin, methotrexate) and rituximab was started. Acyclovir was started to suppress EBV replication (EBV PCR: 611027 copies/ml). On 24<sup>th</sup> day of hospitalization he died because of septic shock and multiorgan failure.

**Conclusion:** Viral load of CMV and EBV should be closely monitorized and oversuppression after LT should be avoided.

**O34****BK Virus Infection and Risk Factors in Pediatric Patients Undergoing Kidney Transplants**

**Begum Avci<sup>1</sup>, Esra Baskin<sup>1</sup>, Kaan Gulleroglu<sup>1</sup>, Zafer Ecevit<sup>2</sup>, Ebru H. Ayyazoglu Soy<sup>3</sup>, Gokhan Moray<sup>3</sup>, Mehmet Haberal<sup>3</sup>**

<sup>1</sup>*Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey*

<sup>2</sup>*Baskent University Faculty of Medicine, Department of Infectious Diseases, Division of Transplantation, Ankara, Turkey*

<sup>3</sup>*Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey*

**Background:** Infections are among the most critical complications affecting graft survival in patients undergoing kidney transplants. BK polyomavirus (BKV) infection represents a serious complication that is common after kidney transplantation and can cause graft dysfunction and loss. We aimed to determine the frequency of BKV infection in pediatric kidney transplant patients, the effect of BKV infection on graft function, and the risk factors of BKV infection.

**Materials and Methods:** We retrospectively evaluated the data of 144 renal transplant patients (female/male: 67/77) aged 0–18 years who received kidney transplantation in the past 10 years and were followed up for at least one year at our center. The demographic data, renal failure etiologies, donor types, immunosuppressive treatments, and laboratory data were recorded. BKV DNA levels were measured by quantitative polymerase chain reaction (PCR) in the urine and serum, which were determined monthly during the first 6 months after transplantation, periodically (every 3 months) during the next 6 months, and whenever elevated creatinine was observed. The urine BKV PCR viral load of greater than  $10^7$  copies/mL were defined as viruria, and a serum BKV PCR viral load greater than  $10^4$  copies/mL was defined as viremia. The patients were grouped as patients with BKV infection (BKV(+)) and without BKV infection BKV(–). These groups were compared in terms of transplant age, gender, end-stage renal disease (ESRD) etiology, donor type, immunosuppressive treatments, presence of ureteral stents, acute rejection episodes, accompanying viral infections, glomerular filtration rate (GFR) and graft loss rate.

**Results:** BKV infection were detected in 12 patients (M/F:7/5) (8,3%). All these patients had viruria (8.3%), eight (5.5%) had viremia, and four (2.8%) had BKVN. The mean age at transplantation was  $13.12 \pm 6.9$  years. The incidence of BKVN among all patients was 2.8%. Graft loss occurred in two patients (1.4%) because of BKVN. When BKV(+) and BKV(–) patients were compared for risk factors, no statistically significant difference was found in terms of gender, transplant age, donor type, the presence of a ureteral stent, acute rejection graft loss or immunosuppressive treatment in both groups ( $p > 0.05$ ). When both groups were compared in terms of ESRD etiology, the difference was statistically significant with the rate of CAKUT was 30.3% in the BKV(–), and 70% in BKV(+) group ( $p < 0.05$ ). The incidence of CMV infection in the BKV(+) group was significantly higher than that in the BKV(–) group ( $p < 0.05$ ). The first- and third-year GFR values of the patients were similar in both groups ( $p > 0.05$ ).

**Conclusions:** The frequency of BKVN in pediatric patients with kidney transplants in our center was consistent with the data reported from other centers. BKV infection is a serious complication with a risk of graft loss in pediatric patients with kidney transplants. Although no specific treatment is available, graft loss can be prevented by early detection and treatment through close periodic control and adequate evaluation of risk factors, especially in the first 6 months after transplantation.

**O35****Encapsulated Peritoneal Sclerosis in an Adolescent with Kidney Transplantation After Long-term Peritoneal Dialysis**

**Emre Leventoğlu, Bahar Büyükkaragöz, Kibriya Fidan, Oğuz Söylemezoğlu, Sevcan A. Bakkaloğlu**

*Gazi University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey*

**Introduction:** Encapsulated peritoneal sclerosis (EPS) is a clinical syndrome with persistent or recurrent symptoms of intestinal obstruction due to adhesions of the diffusely thickened peritoneal membrane (1). It is a long-term complication of peritoneal dialysis (PD) that causes high morbidity and mortality. The prevalence of EPS in children was 2% (2). Long period of peritoneal dialysis, frequent peritonitis and ultrafiltration failure are the risk factors (3).

**Materials and Methods:** Herein, we report a case of a 18-year-old adolescent girl who developed EPS whose EPS-related problems continued after kidney transplantation.

**Results:** We report a case of a 18-years-old girl who was admitted to the hospital when she was 8-years-old with complaints of weakness and failure to thrive. She was diagnosed as renal failure with serum creatinine as 10.98 mg/dL and peritoneal dialysis was started.

She was followed up in the peritoneal dialysis program for seven years, had recurrent peritonitis. High-concentration dialysates were used due to insufficient ultra-filtrate. The peritoneal dialysis was discontinued and hemodialysis program was started at the age of 15 years-old. The patient developed progressive abdominal distension within a few weeks. Intense acid was observed in the ultrasonography. Abdominal tomography showed loculated peritoneal fluid extending from the liver to the pelvis, pushing the bowel loops and stomach posteriorly. In addition, peritoneal thickening that became nodular in places was remarkable. With these findings, the patient was diagnosed with EPS. The patient's complaints regressed and the abdominal circumference decreased from 68 cm to 59 cm with the treatments of steroid and tamoxifen.

Two months after the EPS treatment, kidney transplantation was performed from a HLA fully-matched deceased donor. She received antithymocyte globulin for the induction immunosuppression; corticosteroids, tacrolimus and mycophenolatemofetil were commenced as the maintenance therapy. Tamoxifen, which had been used for 10 months, was discontinued due to an increase in uterine wall thickness.

Three years after the transplantation, the patient presented with complaints of vomiting and abdominal distension. Serum creatinine increased up to 5.02 mg/dL while tacrolimus level was quite high as 18.8. It was observed that there was a 12x25x31 cm peritoneal fluid, increased peritoneal thickness and milimetric calcifications. Dilatation and air-fluid levels were seen in the intestinal loops. Pulse steroid was given after 2000 mL of excretory paracentesis. 16mg/day prednol and 10mg/day tamoxifen were started. However, the patient developed a writhing abdominal pain complaint, and vomiting intensified. Serum amylase and lipase values were found to be 1754 U/L and 2354 U/L, respectively. The patient's intake was discontinued and intravenous hydration was started with the diagnosis of acute pancreatitis. In the follow-up, signs and symptoms regressed, amylase and lipase levels decreased to normal levels and serum creatinine decreased to the basal value of 0.63 mg/dL.

**Conclusion:** In this case, it was stated that factors such as long-term use of PD, a history of bacterial peritonitis, use of high-concentration dialysate may cause EPS. It has been emphasized that it may cause recurrent symptoms after transplantation and even graft loss due to various complications it causes.

**References:**

1. Jagirdar RM, Bozikas A, Zarogiannis SG, Bartosova M, Schmitt CP, Liakopoulos V. Encapsulating Peritoneal Sclerosis: Pathophysiology and Current Treatment Options. *Int J Mol Sci.* 2019 Nov 16;20(22):5765.
2. Honda M, Warady BA. Long-term peritoneal dialysis and encapsulating peritoneal sclerosis in children. *Pediatr Nephrol.* 2010 Jan;25(1):75-81.
3. Stefanidis CJ, Shroff R. Encapsulating peritoneal sclerosis in children. *Pediatr Nephrol.* 2014 Nov;29(11):2093-103.

**O36**

## **Bile Acid Synthesis Defect Due to Aldo-keto Reductase 1D1 (AKR1D1) Mutation: An Underdiagnosed Entity Successfully Treated with Liver Transplantation**

**Khaled Warasneh<sup>1</sup>, Figen Özçay<sup>2</sup>, Serkan Belkaya<sup>3</sup>, Emre Karakaya<sup>4</sup>, Mehmet Haberal<sup>4</sup>**

<sup>1</sup>*Department of Pediatrics, Başkent University Faculty of Medicine, Ankara, Turkey*

<sup>2</sup>*Department of Pediatric Gastroenterology, Başkent University Faculty of Medicine, Ankara, Turkey*

<sup>3</sup>*Department of Molecular Biology and Genetics, Bilkent University, Ankara, Turkey*

<sup>4</sup>*Department of General Surgery, Division of Transplantation, Başkent University Faculty of Medicine, Ankara, Turkey*

**Introduction:** Inborn errors of bile acid synthesis are rare genetic disorders of neonatal cholestasis. AKR1D1 mutations result in  $\Delta^4$ -3-oxosteroid-5 $\beta$ -reductase (5 $\beta$ -reductase) enzyme deficiency. 5 $\beta$ -reductase enzyme deficiency results in the production of hepatotoxic and cholestatic 3-oxo- $\Delta^4$  bile acids. Patients typically present with neonatal cholestasis or neonatal liver failure characterized with elevated transaminases, normal GGT levels, direct hyperbilirubinemia and progressive coagulopathy. Herein, we present a patient with neonatal cholestasis progressed to chronic liver failure due to 5 $\beta$ -reductase enzyme deficiency who successfully treated with liver transplantation.

**Case:** The patient was third child born to first-degree consanguineous parents. The first child of the family died due to gastrointestinal bleeding and chronic liver failure at the age of 4 months.

Our patient presented with jaundice without acholic stools or pruritis at the age of one month. Laboratory tests revealed elevated liver transaminases and direct hyperbilirubinemia with normal GGT levels. Metabolic tests revealed slightly elevated tyrosine levels with positive reducing substance (+2) in urine. Urine succinylacetone level was normal. Chitotriosidase, sphingomyelinase, glucocerebrosidase levels and GALT enzyme activity were normal. Treatment with ursodeoxycholic acid and fat soluble vitamin supplementations was initiated. Bile acid levels were elevated 116.4  $\mu\text{mol/L}$  secondary to exogenous ursodeoxycholic acid treatment. During her follow up she was unresponsive to ursodeoxycholic acid treatment.

The patient was referred to our department for liver transplant evaluation due to progressive liver disease at the age of five months. Physical examination revealed hepatosplenomegaly and jaundice. Biochemical tests were significant for albumin 2.8 g/dL, total bilirubin 30.9 mg/dL, direct bilirubin 20.9 mg/dL, AST 1059 U/L, ALT 926 U/L, GGT 67 U/L, INR 2.86, and AFP 76506.86 IU/mL. Autoimmune liver disease panel and viral markers were negative. A1-Antitrypsin levels were normal. Biochemical and metabolic testing failed to identify the etiology of the underlying cholestasis. At the age of 6 months, the patient underwent left lateral segment liver transplantation from living-related donor. Explanted liver pathology revealed diffuse parenchymal loss, paucity of bile ducts, severe fibrosis, severe hepatic canalicular cholestasis and extra medullary hematopoiesis. Post-transplantation follow-up was unremarkable except for EBV infection and food allergy. After liver transplantation, PFIC panel (ABCB11, ABCB 4, TJP2, NR1H4, ATP8B1) revealed heterozygous c.530C>T mutation in ATP8B1 with unknown clinical significance. Later, whole exom sequencing analysis was performed and a novel c.143G>C homozygous mutation was detected in AKR1D1 gene. Her mother was heterozygous for c.143G>C AKR1D1 gene mutation. Retrospectively, the patient was diagnosed with 5 $\beta$ -reductase enzyme deficiency. She has been routinely followed at our department for 8 years.

**Conclusion:** AKR1D1 mutations (5 $\beta$ -reductase deficiency) should be considered in infants present with progressive neonatal cholestasis or neonatal liver failure. Treatment with chenodeoxycholic acid and cholic acid ameliorates disease progression and normalize hepatic functions. A total of six patients with 5 $\beta$ -reductase deficiency underwent liver transplantation were previously reported. Liver transplantation is curative and should be considered in patients with delayed diagnosis.



**037**

## Two Cases with Neonatal Cholestasis and Renal Findings: DCDC2 (Doublecortin Domain Containing 2) Mutation

Demet Teker Düztaş<sup>1</sup>, Sinan Sarı<sup>1</sup>, Ödül Eğritaş Gürkan<sup>1</sup>, Gülsüm Kayhan<sup>2</sup>, Aydın Dalgıç<sup>3</sup>, Buket Dalgıç<sup>1</sup>

<sup>1</sup>Gazi University Faculty of Medicine, Division of Gastroenterology, Ankara, Turkey

<sup>2</sup>Gazi University Faculty of Medicine, Division of Medical Genetics, Ankara, Turkey

<sup>3</sup>Gazi University Faculty of Medicine, Division of General Surgery, Ankara, Turkey

**Introduction:** Cilia are microtubule-based structures on the mammalian cell surface that mediate the transmission of intercellular signals. With mutations in the genes encoding these ciliary proteins, ciliopathies develop. DCDC2 gene mutations are also in this group and cause hepatic-renal ciliopathy. In this case report, two ciliopathy cases with neonatal cholestasis and different kidney findings and DCDC2 mutation detected during follow-up are presented.

**Case-1:** A five-year-old male patient was referred to our center due to upper gastrointestinal bleeding. The patient was evaluated for neonatal cholestasis. The liver biopsy performed at the age of 2 months were compatible with biliary atresia, but the passage of bile into the intestine was observed in hepatobiliary scintigraphy. His parents were relatives. His brother with jaundice and fever died at the age of 3 months. Physical examination revealed massive splenomegaly and hepatomegaly consistent with portal hypertension. Band ligation was applied to varicose veins detected in upper gastrointestinal endoscopy. Repeated liver biopsy was considered compatible with non-cirrhotic fibrosis. Distal splenorenal shunt was performed due to uncontrollable bleeding. DCDC2 mutation was detected in the patient by whole exome sequencing analysis. At the age of 11, he was diagnosed with Burkitt lymphoma after an operation for ileocolic intussusception. Hemodialysis was started in the patient who developed chronic renal failure in the follow-up due to chemotherapy. Doppler ultrasonography performed on the patient who developed hepatic encephalopathy showed an open shunt but thrombosis in the portal vein. Although the encephalopathy was activated from time to time, it was controlled with medical treatment. The patient underwent combined kidney and liver transplantation. In the follow-up he has uneventful graft functions after transplantation.

**Case-2:** A 1.5-year-old female patient was admitted to our center with neonatal-onset cholestasis. There was consanguinity between her parents. On physical examination, the patient was icteric, and the liver was 6 cm palpable. Abdominal ultrasonography revealed heterogeneous liver parenchyma and dilatation of the intrahepatic bile ducts. Liver biopsy showed as chronic cholestatic liver disease with cirrhotic background. She was admitted at the age of six because of a mass in the kidney. On physical examination, she was icteric and had hepatosplenomegaly and clubbing fingers. Laboratory evaluation revealed signs of hypersplenism as well as impaired liver synthesis functions. Urinary ultrasonography revealed an increased size of the right kidney and a 72x54 mm cystic mass with necrotic content in the upper pole parenchyma. Excisional biopsy was consistent with changes secondary to pyelonephritis and *Escherichia coli* was grown in the cyst fluid. Liver biopsy taken during the operation was evaluated as biliary type cirrhotic liver characterized by bilirubinostasis and ductopenia. DCDC2 mutation was detected by whole exome sequencing analysis. Liver transplantation was appropriate due to progressive liver disease and hepatopulmonary syndrome, the patient was referred to the transplantation center.

**Conclusion:** DCDC2 mutations have been recently described in the literature and are known to be associated with nephronophysis, renal dysplasia, and degeneration. DCDC2 is a structural and signaling protein normally found in the cytoplasm and cilia of cholangiocytes. In DCDC2 mutations, the mutative protein accumulates in the cytoplasm, is not found in the cilia, and ciliopathy develops. As a result, it causes neonatal sclerosing cholangitis in the patient and biliary cirrhosis in the later period. Although neonatal sclerosing cholangitis is a very rare condition, it should be considered in cases mimicking biliary atresia and DCDC2 mutations should be investigated as a cause.

**O38****The Role of Platelet-Lymphocyte Ratio and Neutrophil-Lymphocyte Ratio in Predicting the Delayed Graft Function in Pediatric Renal Transplant Patients**

Meraj Alam Siddiqui<sup>1</sup>, Esra Baskın<sup>1</sup>, Kaan Savaş Gülleroğlu<sup>1</sup>, Aysun Çaltık Yılmaz<sup>1</sup>, Gökhan Moray<sup>2</sup>, Mehmet Haberal<sup>2</sup>

<sup>1</sup>Department of Pediatric Nephrology, Baskent University School of Medicine, Ankara, Turkey

<sup>2</sup>Department of General Surgery, Division of Transplantation, Baskent University School of Medicine, Ankara, Turkey

**Background:** Delayed graft function common is a common adverse outcome after renal transplantation in pediatric patients. An early prediction and prevention of DGF is often challenging and misleading. Herein, we investigated the correlation between delayed graft function and non-invasive hematologic parameters to predict the possible adverse outcomes prior to the renal transplantation in pediatric patients.

**Materials and Methods:** In this retrospective study, we randomly selected and compared the hematologic parameters of 16 patients with DGF with the 35 patients without DGF and assessed the correlation between DGF and neutrophil to lymphocyte ratio (NLR) and platelet to lymphocyte ratio (PLR). We included a total of 51 pediatric patients, aged between 1-18 years, who underwent renal transplantation at Başkent University Hospital, Ankara, Turkey. Clinical features and laboratory data were obtained from Başkent University Hospital's electronic medical record system. We assessed the complete blood count of 51 pre-operative kidney transplant recipients. Receiving operating characteristic (ROC) curve analysis was performed to classify the optimal cut-off values for PLR and NLR with highest sensitivity and specificity. The categorized data were compared by using the Pearson chi-square test and Fisher exact test. Data was analysed using the IBM SPSS statistics ver. 26.0 (IBM Co., Armonk, NY, USA). A 2-sided  $P < 0.05$  was considered statistically significant.

**Results:** A total of 51 pediatric kidney transplant patients were retrospectively evaluated in this assessment. Thirty-three (64.7%) patients were male with median age of 12 (interquartile range 8-18) years. Selected sixteen (31.4%) renal transplant patients with DGF, and 35 (68.6%) patients without DGF had no concomitant comorbidities. The cut-off values were identified as 160 for PLR (sensitivity and specificity: 0.667 and 0.286) and 5 for NLR (sensitivity and specificity: 0.40 and 0.28). After validating the cut-off values by using receiving operating characteristic curve (ROC) analysis, the inflammation indexes for the patients were further categorized into two groups [PLR:  $\leq 160$  (low) and  $> 160$  (high), NLR:  $\leq 5$  (low) and  $> 5$  (high)]. The low level of PLR and NLR had the higher proportion of delayed graft rejection when compared to the inflammatory index of the rejection free patients (68.8% vs. 31.4%,  $p=0.014$ ; and 98.8% vs. 55.3%,  $p < 0.001$ , respectively).

**Conclusion:** In our study, elevated pre-transplantation low PLR and NLR was associated with the increased number of delayed graft dysfunction. More prospective, longitudinal, and multicentre studies are required to validate their role in determining the prognosis of renal transplantation.

**039**

## Long Term Outcomes of Renal Transplant Recipients with Juvenile Nephronophthisis

**Begum Avci<sup>1</sup>, Esra Baskin<sup>1</sup>, Kaan Gulleroglu<sup>1</sup>, Aysun Caltik Yilmaz<sup>1</sup>, Aydıncan Akdur<sup>2</sup>, Gokhan Moray<sup>2</sup>, Mehmet Haberal<sup>2</sup>**

<sup>1</sup>Baskent University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

<sup>2</sup>Baskent University Faculty of Medicine, Department of General Surgery, Division of Transplantation, Ankara, Turkey

**Background:** Nephronophthisis (NPHP), an autosomal recessive tubulointerstitial nephropathy, is the most common genetic cause of end-stage renal disease (ESRD), accounts for %10-20 of renal failure cases in childhood. The first symptoms of juvenile NPHP generally start at about 6 years of age; ESRD develops at a mean age of about 13 years. Treatment of patients with NPHP is symptomatic; kidney transplantation is the treatment of choice patients with ESRD. Disease recurrence has never been reported after renal transplantation. A few reports have been regarding the outcomes after the renal transplantation of patients with juvenile NPHP. We reported the outcomes of renal transplant recipients with a primary diagnosis of juvenile NPHP in our center.

**Methods and Patients:** We retrospectively analyzed medical records of seventeen renal transplant patients with a primary diagnosis of juvenile NPHP. Demographic data of patients, donor types and rejection and, glomerular filtration rates at 1 and 5th years, graft loss were recorded.

**Results:** The mean age of the patients was  $151.73 \pm 51.45$  months, the mean follow-up period was  $79.5 \pm 41.9$  months. Of the 17 patients, 5 (29.4%) received a cadaveric donor and 12 (70.6%) received a living related donor transplantation. Preemptive renal transplantation was performed in 4 (23.5%) patients. Posttransplantation immunosuppression comprised corticosteroids, a calcineurin inhibitor, mycophenolate mofetil. Thirteen (76.4%) patients received tacrolimus and 3 (17.6%) patients received cyclosporin and 1 (5.8%) patient received sirolimus. After the transplantation in the follow-up period acute rejection developed in 3 (17.6%) cases and graft loss developed in 1 (5.8%) patients. The mean glomerular filtration rates after renal transplantation at 1 and 5 years were  $96.7 \pm 23.2$ , and  $84.7 \pm 31.1$  mL/min/1.73m<sup>2</sup>, respectively.

**Conclusion:** We observed preserved graft functions for long periods, we can say that post-transplant prognosis is good among renal transplant recipients with juvenile NPHP. Chronic allograft nephropathy developed rarely on long term follow-up.

## O40

## The Management of Patients with Venous Thrombosis of a Transplanted Kidney in the Early Postoperative Period (A Practice Case)

A. M. Khadjibaev<sup>1</sup>, F. A. Khadjibaev<sup>1</sup>, P. K. Sultanov<sup>2</sup>, D. N. Ergashev<sup>2</sup>, A. A. Ismatov<sup>2</sup>

<sup>1</sup>Republican Research Center of Emergency Medicine, Department of General Surgery, Republic of Uzbekistan

<sup>2</sup>Republican Research Center of Emergency Medicine, Department of Transplantology, Republic of Uzbekistan

**Introduction:** Renal graft vein thrombosis is one of the formidable complications of kidney transplantation, which occurs in 0.2 to 4.0% of cases and most often leads to the removal of the graft (Lerman, Mark & Mulloy et al., 2019). Thrombolytic therapy may be effective, but angiographic interventions or revision of the anastomosis with thrombectomy may most likely be required.

**Case:** A 13-year-old boy applied for kidney transplantation with a diagnosis of chronic kidney disease, which was diagnosed in 2017. The patient, according to the recommendations of a nephrologist, regularly received outpatient treatment at the residence place. In 2018, the patient was recommended to undergo programmed hemodialysis with the prospect of kidney transplantation. In connection with the refusal of the patient from programmed hemodialysis, the patient was decided to carry out proactive kidney transplantation. The donor was a cousin from the patient's mother T.N. 30 years old. HLA compatibility showed HLA-A, B and DR matches - one match each. Cross match - 10%. The patient underwent a heterotopic kidney transplantation into the right iliac region with the imposition of an end-to-side anastomosis between the kidney artery and the external iliac artery, as well as the renal vein with the external iliac vein as an "end-to-side" one. Uretero-vesical anastomosis was applied according to the standard Leach-Gregoire procedure with JJ stenting. Intraoperatively, there was a small amount of urine flow. After the operation, the patient's hourly urine output did not exceed 50 ml per hour, and ultrasound with Doppler ultrasonography of the graft showed a reverse blood flow of the graft vessels with high vascular resistance index (RI = 1.0). The patient is suspected of thrombosis of the venous anastomosis and is urgently taken to the operating room for revision. When the external iliac vein was opened below the anastomosis, there was a thrombosis of the external iliac vein with spread to the graft vein, completely covering the lumen of the vein. Produced thrombectomy with reperfusion of the transplanted kidney with Kustadiol solution through the arteriotomy opening. Further, the external iliac vein and the arteriomyopathy were sutured. After the start of blood flow, the size, consistency and color of the kidney returned to normal. Intraoperatively, ultrasound of the graft with Doppler sonography was performed - the blood flow was satisfactory, (RI = 0.8). After the operation, diuresis of up to 150 ml per hour was noted. The recipient received standard three-way immunosuppressive therapy. In the postoperative period, in the first 2 days, 2 sessions of hemodialysis were performed. The first postoperative day, the daily urine output was 650 ml, which gradually increased to 4200 ml on the 8th day after the operation. The creatinine level decreased from 0.69 mmol / L to 0.3 mmol / L on the 8th day after surgery. Moderate proteinuria was noted at 1.32 g / l on day 2 and 0.099 g / l on 7 day after surgery. Ultrasound with dopplerography of the transplanted kidney on the 12th day: the contours of the kidney are even, clear, dimensions 12.7x6.3 cm. TRP-1.7-1.9cm; pyramidal pattern is not pronounced; PCS are not expanded; the pelvis is not expanded, there is a stand in the cavity; blood flow in arcuate arteries - Max V - 18.5 cm / sec, RI-0.60; in segmental arteries - Max V - 43.9 cm / sec, RI-0.79; on the anastomosis: Max V - 157.0 cm / sec, RI-0.87;

**Conclusions:** The cause of venous anastomosis thrombosis is most often the kink or twisting of the renal vein, stenosis of the anastomosis, hypotension, hypercoagulability, or acute graft rejection. Doppler ultrasound can detect signs of graft vein thrombosis. Early diagnosis and timely intervention allows you to preserve and restore the function of the graft.

**O41****Value of Neutrophil-Lymphocyte and Platelet-Lymphocyte Ratios in the Evaluation of Acute Rejection and Chronic Allograft Nephropathy in Children with Kidney Transplantation**

Hülya Ercan Emreol<sup>1</sup>, Bahar Büyükkaragöz<sup>2</sup>, Sevcan A. Bakkaloğlu<sup>2</sup>, Kibriya Fidan<sup>2</sup>, Oğuz Söylemezoğlu<sup>2</sup>, Necla Buyan<sup>2</sup>

<sup>1</sup>Gazi University Faculty of Medicine, Department of Pediatrics, Ankara, Turkey

<sup>2</sup>Gazi University Faculty of Medicine, Department of Pediatric Nephrology, Ankara, Turkey

**Introduction:** Neutrophil-lymphocyte ratio (NLR) and platelet-lymphocyte ratio (TLR) have become accepted markers of inflammation in recent years and are used to assess disease activity in some diseases. In this study, we investigated the relationship between NLR and TLR values and acute rejection (AR) attacks as well as their role in determining chronic allograft nephropathy (CAN) in the follow-up of kidney transplant (KTx) patients.

**Material and Methods:** 58 KTx patients aged 5-18 years with at least 5-year follow-up at our center were included. Patients with a history of secondary KTx, concomitant malignancy and a shorter follow-up time were excluded. Physical examination, medical history, laboratory parameters in the post-KTx 1st, 3rd and 6th month, 1st, 2nd, 3rd, 4th and 5th years, and renal biopsy reports were reviewed.

**Results:** Both NLR and TLR were significantly higher during AR attacks ( $p=0.003$  for NLR,  $p=0.002$  for TLR). Although both NLR and TLR values were higher in patients with CAN at the end of 5-year post-KTx follow-up, the difference was not statistically significant ( $p=0.69$  for NLR and  $p=0.55$  for TLR). When the patients with and without CAN within 5 years were compared, the ones with CAN development had significantly higher NLR and TLR values in all periods in the post-KTx first 2 and 4 years, respectively. From the patients with AR attacks, those who subsequently developed CAN had higher NLR in the post-KTx first 3 years, and TLR was higher in post-KTx all time periods, although without a statistically significant level.

**Conclusions:** This is the first study on evaluation of NLR and TLR in children with KTx. Our results indicate that both values can be used as useful and easily accessible markers in AR diagnosis and CAN prediction, the two major causes of post-KTx graft loss. Pediatric studies with larger populations are needed to support our findings.

## Author Index\*

### A

Abounader M 20  
Akça Bayar S 70  
Akdur A 49, 53, 60, 61, 62, 67, 77  
Akhbetova A 55  
Akkoyun İ 69  
Almat C 55  
Al-Mousawi M 19  
Altinova B 43  
Altynova V 44  
Apalkova V 35  
Arasteh P 30  
Argani H 25  
Avci B 40, 72, 77  
Aydın Hİ 62  
Aykenar B 68  
Aynakulov A 44  
Ayvazoğlu Soy EH 52, 53, 54, 60, 67, 72

### B

Babicheva O 35  
Baizhanbayeva A 51  
Bakhytzhana S 55  
Bakırcı O 58  
Bakkaloğlu SA 46, 73, 79  
Banerjee S 29  
Barbari A 27  
Baskın E 38, 40, 41, 45, 49, 50, 72, 76, 77  
Belkaya S 74  
Bolatbek B 55  
Boyvat F 54, 60, 61  
Buyan N 46, 79  
Büyükkaragöz B 46, 73, 79

### C

Caltik Yılmaz A 40, 49, 50, 76, 77  
Chapman JR 26  
Chauhan S 29  
Chokhonelidze I 42  
Çelikkaya E 48

### D

Dalgıç A 63, 64, 75  
Dalgıç B 63, 64, 75  
Dara Kar HD 62  
Dave R 29  
Dehghani M 30  
Demir H 71  
Diehtiarova D 35  
Dogrul AB 57, 71  
Dönger U 58

### E

Ecevit Z 72  
Eğirtaş Gürkan Ö 63, 64, 75  
Ercan Emreol H 79  
Ergashev DN 37, 78  
Ersoy Z 68

### F

Fadel F 34  
Fidan K 46, 73, 79

### G

Gedik E 39  
Gemici A 50  
Ghnaimat M 23  
Godik O 35  
Gökgöz G 70  
Grogul Y 35  
Gulleroglu K 40, 49, 50, 72, 76, 77  
Gumus E 57, 71  
Güngör T 48

### H

Haberal M 38, 39, 40, 41, 45, 49, 50, 53, 54, 60, 61, 62, 67, 68, 69, 70, 72, 74, 76, 77  
Hafez MH 24  
Hakim G 20  
Hakim N 20  
Harman A 54  
Hizarcioğlu Gulsen H 57, 71

### I

Ismatov AA 37, 78  
Issakov S 44  
Iyengar A 21  
İgüs B 61

### J

Jenalayev D 51

### K

Kamel R 31  
Karakaya D 48  
Karakaya E 40, 53, 54, 60, 61, 67, 74  
Kargın Çakıcı E 48  
Kashbadze K 66  
Kasradze T 42  
Kaya D 39  
Kayhan G 75  
Kazemi K 30  
Khadjibaev AM 37, 78  
Khadjibaev FA 37, 78  
Khosravi MB 30  
Kiladze S 42  
Kute V 29  
Kuttymuratov G 44, 51

### L

Leventoğlu E 46, 73

### M

Malekhosseini SA 30  
Mamlin O 51  
Marino IR 32  
Masri M 28  
McCulloch M 21  
Meshram HS 29  
Mishra V 29  
Moray G 40, 49, 50, 53, 60, 67, 72, 76, 77  
Mustafinov D 51

### N

Nedbala V 35  
Nikeghbalian S 30  
Nikoupour H 30

### O

Ok Atılğan A 45  
Orhan D 57  
Oto S 69  
Ozen H 57  
Ozen O 54, 61  
Özaltın F 48  
Özçay F 58, 62, 74  
Özdemir BH 38, 41, 45  
Özdemir FN 38, 41, 45  
Öztürk H 63

### R

Rakhimzhanova S 44  
Rysmakhanov M 44, 51

### S

Saadi G 22  
Saeed B 18  
Saltik Temizel İN 71  
Samat I 36  
Sarı S 63, 64, 75  
Sarıgül Sezenöz A 69  
Shaheen FAM 17  
Shamsaeefar A 30  
Siddiqui MA 50, 58, 76  
Söylemezoğlu O 46, 73, 79  
Sözen H 63, 64  
Sultanov PK 37, 78  
Şafak A 53  
Şahintürk H 39, 68

### T

Teker Düztaş D 64, 75  
Tomadze G 42  
Tortumlu G 69, 70

### U

Uslu A 68

### V

Varan A 57, 71  
Vodianytskyi S 35

### W

Warashe K 58, 62, 74

### Y

Yarbug Karakayali F 50  
Yazılıtaş F 48  
Yerimova N 55  
Yersiz H 33  
Yeşiler Fİ 39, 68  
Yıldırım S 67  
Yılmaz Akçay E 38, 41  
Yılmaz G 70

### Z

Zeyneloğlu P 39, 68  
Zhovnir V 35