Program Book & Abstracts

The 2nd International Congress of

Living Donor Liver Transplantation Study Group

(ILDLT Study Group 2015)

대한간이식연구회
The Korean Liver Transplantation Society

Joint with the Korean Liver Transplantation Society

November 7(Sat) ~ 8(Sun), 2015
JW Marriott Dongdaemun Square Seoul

SEOUL METROPOLITAN GOVERNMENT

www.ildlt.org

C O N T E N T S

The 2nd International Congress of

Living Donor Liver Transplantation Study Group

(ILDLT Study Group 2015)

대한간이식연구회
The Korean Liver Transplantation Society

Joint with the Korean Liver Transplantation Society

INVITATION

On behalf of the Organizing Committee, it is our great pleasure to invite you to the 2nd International Congress of Living Donor Liver Transplantation Study Group (ILDLT Study Group 2015) to be held at the JW Marriott Dongdaemun Square Seoul, Korea on November 7 (Sat) - 8 (Sun), 2015.

The 2nd International Congress of LDLT Study Group is planning an exciting Scientific Program that will provide an opportunity to meet eminent speakers and delegates from all over the world to share the most up-to-date surgical accomplishments and new techniques in the field of Living Donor Liver Transplantation. In particular, we are planning to organize Live LDLT Demonstrations in major centers in Seoul.

Furthermore, Seoul, a dynamic city full of charm, will be in its most beautiful fall season during the congress. In addition to its deep historical and cultural heritage, the capital provides all the possible conveniences and world-class facilities of an international megalopolis that it is today.

We are confident that the Congress will offer much to see, learn, and take away as long-lasting memories, and invite you to participate in this wonderful experience.

We look forward to welcoming you to the 2nd International Congress of LDLT Study Group in Seoul, Korea.

Sincerely yours,

Sung-Gyu Lee, MD, PhD

President, Congress Organizing Committee
The 2nd International Congress of LDLT Study Group

Kyung-Suk Suh, MD, PhD

Vice-President, Congress Organizing Committee
The 2nd International Congress of LDLT Study Group

LDLT STUDY GROUP COUNCIL MEMBERS

PRESIDENT	Sung-Gyu Lee	Asan Medical Center, Ulsan University	Korea
VICE-PRESIDENT	Kyung-Suk Suh	Seoul National University Hospital	Korea
ADVISORY COUNCIL	Chao-Long Chen	Kaohsiung Chang Gung Memorial Hospital	Taiwan
	Shinji Uemoto	Kyoto University	Japan
	Chung-Mau Lo	The University of Hong Kong	Hong Kong, China
	Suk-Koo Lee	Samsung Medical Center, Sungkyunkwan University	Korea
	Elizabeth Anne Pomfret	Lahey Clinic	USA
	Soon-Il Kim	Severance Hospital, Yonsei University College of Medicine	Korea
EXECUTIVE COUNCIL	Hiroto Egawa	Tokyo Womens` Medical University	Japan
	Mureo Kasahara	National Center for Child Health and Development	Japan
	Toru Ikegami	Kyushu University	Japan
	Chih-Chi Wang	Chang Gung University	Taiwan
	Rey-Heng Hu	National Taiwan University	Taiwan
	See Ching Chan	The University of Hong Kong, Queen Mary Hospital	Hong Kong, China
	Choon Hyuck David Kwon	Samsung Medical Center, Sungkyunkwan University	Korea
	Deok-Bog Moon	Asan Medical Center, Ulsan University	Korea
	Kwang-Woong Lee	Seoul National University Hospital	Korea
	Kim Olthoff	Hospital of the University of Pennsylvania	USA
	Jan Lerut	University Hospitals Saint Luc	Belgium
SECRETARY	Gi Won Song	Asan Medical Center, Ulsan University	Korea
AUDITOR	Myung-soo Kim	Severance Hospital, Yonsei University College of Medicine	Korea
	Susumu Eguchi	Nagasaki University Graduate School of Biomedical Sciences	Japan

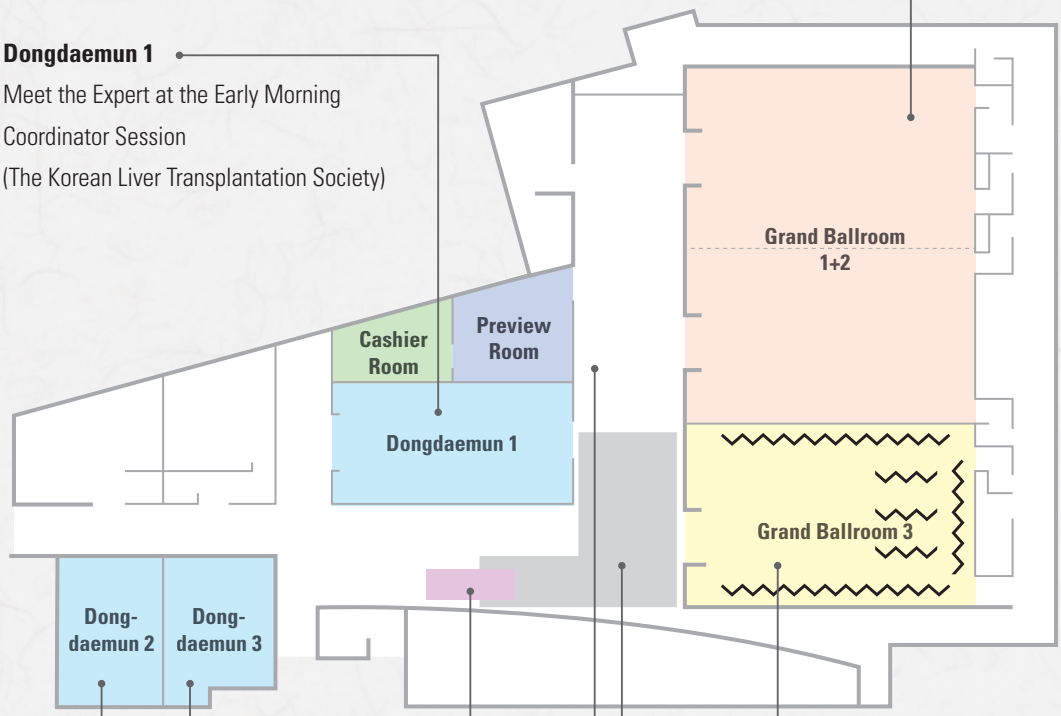
CONGRESS ORGANIZING COMMITTEE

CONGRESS PRESIDENT	Sung-Gyu Lee	Asan Medical Center, Ulsan University	Korea
CONGRESS VICE-PRESIDENT	Kyung-Suk Suh	Seoul National University Hospital	Korea
SECRETARY	Gi Won Song	Asan Medical Center, Ulsan University	Korea
SCIENTIFIC PROGRAM COMMITTEE CHAIR	Kyung-Suk Suh	Seoul National University Hospital	Korea
SCIENTIFIC PROGRAM COMMITTEE MEMBER	Mureo Kasahara	National Center for Child Health and Development	Japan
	Kwang-Woong Lee	Seoul National University Hospital	Korea
	Choon Hyuck David Kwon	Samsung Medical Center, Sungkyunkwan University	Korea
	Gi Won Song	Asan Medical Center, Ulsan University	Korea
PUBLICATION COMMITTEE CHAIR	Soon-Il Kim	Severance Hospital, Yonsei University College of Medicine	Korea
PUBLICATION COMMITTEE MEMBER	Myoung Soo Kim	Severance Hospital, Yonsei University College of Medicine	Korea
	Deok-Bog Moon	Asan Medical Center, Ulsan University	Korea
	Nam-Joon Yi	Seoul National University Hospital	Korea
	Chongwoo Chu	Pusan National University	Korea

FLOOR PLAN

Grand Ballroom 1+2
ILDLT Study Group 2015 Sessions
General Assembly of LDLT Study Group
General Assembly of the Korean Liver Transplantation Society
Luncheon Symposium

Dongdaemun 1
Meet the Expert at the Early Morning
Coordinator Session
(The Korean Liver Transplantation Society)



Registration Desk

Closing Reception

Dongdaemun 2, 3
Meet the Expert at the Early Morning

Grand Ballroom 3
Poster Presentation with Coffee
Sponsor Booth

Foyer
Sponsor Booth

CONGRESS INFORMATION

CONGRESS OVERVIEW

TITLE
The 2nd International Congress of LDLT Study Group (ILDLT Study Group 2015)
Joint with the Korean Liver Transplantation Society

PERIOD
November 7 (Sat) - 8 (Sun), 2015

VENUE
JW Marriott Dongdaemun Square Seoul

PROGRAM HIGHLIGHTS
- Meet the Expert at the Early Morning
- Symposium 1: Immunology in Liver Transplantation
- Symposium 2: How to Establish a New LDLT Program?
- Symposium 3: Current Emerging Issues at LDLT
- Video Battle: How Do I Do?
- Debate Session
- Poster Presentation
- Live Demonstration of LDLT at Centers of Excellence

ORGANIZED BY
The Organizing Committee of the 2nd International Congress of LDLT Study Group

OFFICIAL LANGUAGE
English

VENUE INFORMATION

VENUE
JW Marriott Dongdaemun Square Seoul

ADDRESS
279 Cheonggyecheon-ro, Jongno-gu, Seoul, Korea

CONTACT
Tel: +82-2-2276-3000, Fax: +82-2-2276-3001

REGISTRATION

Registration Category & Fees

CATEGORY	CONGRESS REGISTRATION FEE	LDLT STUDY GROUP ANNUAL MEMBERSHIP FEE	TOTAL
Regular / Congress + Membership	USD 50	USD 50	USD 100
Regular / Congress Only	USD 120	-	USD 120
Trainee / Congress + Membership	USD 20	USD 30	USD 50
Trainee / Congress Only	USD 60	-	USD 60

Entitlements

- Access to all scientific sessions
- Program book & Abstracts
- Congress kit
- Coffee break and lunch
- Live Demonstration
- Exhibition

Certificate of Attendance

All participants may download and print a certificate of attendance at My Page of the congress website (http://ILDLT.org). This will be available after the congress.

COFFEE BREAKS

Fresh coffee will be served in the exhibition hall (Grand Ballroom 3, Lower Lobby Floor) during the break times.

*SERVING TIME

COFFEE BREAK	11:20-11:40
POSTER PRESENTATION WITH COFFEE	15:20-16:20

CLOSING RECEPTION

DATE & TIME	November 7 (Sat), 18:00-18:30
PLACE	Foyer, Grand Ballroom, Lower Lobby Floor

*Enjoy cocktails with finger foods at Closing Reception. Best Poster Award will be given during the Closing Reception. There will also be "Lucky Draw" at the end of the Closing Reception.

Do not miss the opportunity to be the winner of the Extenal Hard Disk Drive, Portable Battery Charger and iPad mini4!

PREVIEW ROOM

DATE & TIME	November 7 (Sat), 2015, 07:00-18:30
LOCATION	VIP Room (Lower Lobby Floor)

- Speakers are required to visit the Preview Room and upload your final presentation files 2 hours before the session begins to ensure that the backgrounds, graphics and linked images or videos appear properly.
- Presentation materials should be brought in a USB memory stick.
- If a presentation includes animation(s), movie clip(s) or sound, please let the staff know in advance in the Preview Room.
- If you bring your own laptop, especially MAC, you should also bring all the necessary adaptors which are compatible with the RGB port and visit the Preview Room to check their compatibility with the technical system.
- As lectures by invited speakers will be recorded for e-learning purpose during the congress, we kindly ask the speakers to sign the Copyright Agreement form in the Preview Room if you agree to the usage of your lecture and presentation slides.

CASHIER ROOM

DATE & TIME	November 7 (Sat), 2015, 07:00-18:30
LOCATION	VIP Room (Lower Lobby Floor)

- Awardees and Invited Speakers / Chairpersons are required to visit the Cashier Room to receive your Award or Honorarium.
- Please bring a copy of your passport to identify yourself.

SCIENTIFIC PROGRAM

PROGRAM AT A GLANCE

Time	Day 1 : November 7 (Sat)						Day 2 : November 8 (Sun)			
		Grand Ballroom 1+2 (Lower Lobby)	Grand Ballroom 3 + Foyer	Dongdaemun 1 (Lower Lobby)	Dongdaemun 2 (Lower Lobby)	Dongdaemun 3 (Lower Lobby)	Asan Medical Center	Samsung Medical Center	Seoul National University Hospital	Severance Hospital
07:30	Registration			Meet the Expert at the Early Morning 1	Meet the Expert at the Early Morning 2	Meet the Expert at the Early Morning 3	Live Demonstration 1	Live Demonstration 2	Live Demonstration 3	Live Demonstration 4
08:00										
08:30		Break	*Participants may view the submitted poster abstracts in Grand Ballroom 3.							
09:00		Opening Remark								
09:30		Symposium I								
10:00		Debate Session								
10:30										
11:00			*The Poster Presentation with Coffee session will be held from 15:20 to 16:20 in Grand Ballroom 3.							
11:30		Coffee Break								
12:00		Symposium II								
12:30		General Assembly (LDLT Study Group)								
		General Assembly (The Korean Liver Transplantation Society)								
13:00		Luncheon Symposium (Sponsored by Astellas)	*Participants may view the Exhibition in Grand Ballroom 3 and the Foyer.							
13:30										
14:00		Symposium III								
14:30										
15:00										
15:30			Poster Presentation with Coffee							
16:00										
16:30		Video Battle								
17:00				Coordinator Session						
17:30										
18:00			Closing Reception							

*Coordinator Session will be conducted in Korean.

LIVE DEMONSTRATION

DATE November 8 (Sun), 2015

VENUE Asan Medical Center
Samsung Medical Center
Seoul National University Hospital
Severance Hospital

LANGUAGE English

Application is available for the Live Demonstration at the On-site Registration Desk. Detailed programs may differ from center to center.
Shuttle buses will be arranged between the congress venue (JW Marriott Dongdaemun Square Seoul) and each center.

Invited Discussants for the Live Demonstration

CENTER	DISCUSSANT	AFFILIATION	COUNTRY
Asan Medical Center	Batsaikhan Batsuur	The First Central Hospital of Mongolia	Mongolia
	Erdene Sandag	Mongolian National University of Medical Science	Mongolia
	Le Truong Chien	ChoRay Hospital	Vietnam
	Hoang Cong Thanh	ChoRay Hospital	Vietnam
	Tran Dinh Quoc	ChoRay Hospital	Vietnam
Samsung Medical Center	Oliver Soubrane	Beaujon Hospital	France
Seoul National University Hospital	Akihiko Soyama	Nagasaki University Graduate School of Biomedical Sciences	Japan
	Takahito Yagi	Okayama University Hospital	Japan
	Neerav Goyal	Indraprastha Apollo Hospital	India
Severance Hospital	Hee Chul Yu	Chonbuk National University Medical School	Korea
	Chong Woo Chu	Pusan National University Yangsan Hospital	Korea
	Dong Sik Kim	Korea University Medical Center	Korea
	Myoung Soo Kim	Severance Hospital, Yonsei University College of Medicine	Korea

Suttle Bus (from JW Marriott Dongdaemun Square Seoul)

Asan Medical Center	07:50 AM	Samsung Medical Center	08:10 AM
Seoul National University Hospital	07:40 AM	Severance Hospital	08:00 AM

SCIENTIFIC PROGRAMS (Day 1 : November 7)

07:30-08:30	**Meet the Expert at the Early Morning 1**	Dongdaemun 1
	Assessment of Donor Bile Duct Anatomy and Division: How do I do?	Toshimi Kaido (Japan) Gi-Won Song (Korea)
07:30-08:30	**Meet the Expert at the Early Morning 2**	Dongdaemun 2
	Donor Evaluation and Selection Protocol	Sumihito Tamura (Japan) Nam-Joon Yi (Korea)
07:30-08:30	**Meet the Expert at the Early Morning 3**	Dongdaemun 3
	Perioperative Care of LDLT Recipient: What is Different from DDLT?	Chih Chi Wang (Taiwan) Kim Olthoff (USA)
08:50-09:00	**Opening Remark**	Sung-Gyu Lee (Korea)
09:00-10:00	**[Symposium 1] Immunology in Liver Transplantation**	Grand Ballroom 1+2
	CHAIRPERSONS: Yonson Ku (Japan), Suk-Koo Lee (Korea)	
09:00-09:20	De Novo Autoimmune Hepatitis after LDLT	Hiroto Egawa (Japan)
09:20-09:40	Operational Immune Tolerance after Pediatric LDLT: What's the Next Steps?	Mureo Kasahara (Japan)
09:40-10:00	Donor Reactive CD25+CD4+ FoxP3+ Regulatory T-cells - Bench to Bedside	Sang-Mo Kang (USA)
10:00-11:20	**[Debate Session]**	Grand Ballroom 1+2
	CHAIRPERSONS: Sung-Gyu Lee (Korea), Jan Lerut (Belgium)	
	Debate 1 : Graft Factors and HCC Recurrence after LDLT	
10:00-10:10	Yes: There is Some Association	See Ching Chan (Hong Kong, China)
10:10-10:20	No: There is No Association	Shin Hwang (Korea)
10:20-10:40	Discussion	
	Debate 2 : Constant Wrangling over Graft Selection in Adult LDLT	
10:40-10:50	Right Lobe	Chung-Mau Lo (Hong Kong, China)
10:50-11:00	Left Lobe with Portal Flow Modulation	Elizabeth Anne Pomfret (USA)
11:00-11:20	Discussion	
11:20-11:40	Coffee Break	
11:40-12:20	**[Symposium 2] How to Establish a New LDLT Program**	Grand Ballroom 1+2
	CHAIRPERSONS: Motohide Shimazu (Japan), Hee-Jung Wang (Korea)	
11:40-11:47	New LDLT Program in Mongolia	Sergelen Orgoi (Mongolia)
11:47-11:54	New LDLT Program in Vietnam	Pham Huu Thien Chi (Vietnam)
11:54-12:00	New LDLT Program in Kazakhstan	Zhaksylyk Doskaliyev (Kazakhstan)
12:00-12:10	Outreach LDLT Program	Susumu Eguchi (Japan)
12:10-12:20	How to Support a Beginning LDLT Program	Kwang-Woong Lee (Korea)

12:20-12:40	**General Assembly (LDLT Study Group)**	Grand Ballroom 1+2
12:40-13:00	**General Assembly (The Korean Liver Transplantation Society)**	Grand Ballroom 1+2
13:00-13:40	**Luncheon Symposium (Sponsored by Astellas)**	Grand Ballroom 1+2
	CHAIRPERSONS: Kyung-Suk Suh (Korea)	
	Prolonged-release Tacrolimus: Unlocking the Benefits	John O'Grady (United Kingdom)
13:40-15:20	**[Symposium 3] Current Emerging Issues at LDLT**	Grand Ballroom 1+2
	CHAIRPERSONS: Soon-Il Kim (Korea), Chih-Che Lin (Taiwan)	
13:40-14:00	Optimal Volumetric Assessment of Liver Volume	Toru Ikegami (Japan)
14:00-14:20	Role of Cine-portography in Patient with Portal Vein Thromsbosis	Deok-Bog Moon (Korea)
14:20-14:40	Living Donors and Donor-Recipient Matching Using a Novel Living Donor Risk Index	Kim Olthoff (USA)
14:40-15:00	Biologic Markers in LT for HCC	Jan Lerut (Belgium)
15:00-15:20	LT for Hilar Cholangiocarcinoma	Johnny C. Hong (USA)
15:20-16:20	**Poster Presentation with Coffee**	Grand Ballroom 3
16:20-17:55	**[Video Battle] How Do I Do?**	Grand Ballroom 1+2
	CHAIRPERSONS: Rey-Heng Hu (Taiwan), Dong-Goo Kim (Korea)	
	Battle 1: Pure Laparoscopic Donor Right Hemihepatectomy	
16:20-16:30	Samsung Medical Center	Choon Hyuck David Kwon (Korea)
16:30-16:40	Asan Medical Center	Ki-Hun Kim (Korea)
16:40-16:55	Discussion	
	Battle 2: Standard Anastomosis Technique: From HV to BD	
16:55-17:10	Chang Gung Memorial Hospital	Chih-Che Lin (Taiwan)
17:10-17:25	Samsung Medical Center	Jae-Won Joh (Korea)
17:25-17:40	Global Hospitals & Health City	Mohamed Rela (India)
17:40-17:55	Discussion	
16:40-17:55	**[Coordinator Session]**	Dongdaemun 1
	CHAIRPERSONS: Hea Seon Ha (Korea), Hyung Sook Kim (Korea)	
16:40-17:05	Pitfalls of Current Regulation of Emergency Status 2A in LT	Ji Yeon Park (Korea)
17:05-17:30	The Role of the Transplant Coordinator of the Transition to the MELD System	Kyung Ock Jeon (Korea)
17:30-17:55	The Quality of Life in Living Donors after Liver Transplantation	Seung Heui Hong (Korea)
18:00-18:30	**Closing Reception**	

POSTER PRESENTATIONS

15:20-16:20	**Poster Presentation 1**	Grand Ballroom 3
	CHAIRPERSONS: Gi-Won Song (Korea), See Ching Chan (Hong Kong, China)	
PP-1008	Liver transplantation for biliary atresia: a nationwide investigation from 1996 to 2013 in mainland (China)	Ping Wan (China)
PP-1032	Outcomes of living and deceased donor liver transplant recipients according to the MELD score	Juhan Lee (Korea)
PP-1003	Analysis of early reoperation following living donor liver transplantation	Takanobu Hara (Japan)
PP-1017	Outcome of Living Donor Liver Transplantation using Partial Liver Allografts with Multiple Arterial Supply	Kyo Won Lee (Korea)
PP-1021	Impact of intraoperative blood transfusion on long-term outcomes of liver transplantation for hepatocellular carcinoma	SL Sin (Hong Kong, China)
PP-1125	Impact of genetic relation of the donor on the outcome of living donor liver transplantation. A single center experience	Mahmoud Ali (Egypt)
15:20-16:20	**Poster Presentation 2**	Grand Ballroom 3
	CHAIRPERSONS: Kwang-Woong Lee (Korea), Toru Ikegami (Japan)	
PP-1040	Dealing with tuberculosis in the living donor liver transplantation setting: a decade of experience from India	Prashant Bhangui (India)
PP-1036	Efficacy of biliary splint at the anastomosis for postoperative endoscopic treatment of biliary stricture following living donor liver transplantation	Satomi Okada (Japan)
PP-1029	The Role of Curative Intent Surgical Resection for the Recurrent HCC	Seung Hwan Song (Korea)
PP-1028	The benefit of dual tracer 11C-acetate and 18F-FDG PET CT as part of routine work up in living related liver transplant- A single Center Experience	Tan To Cheung (Hong Kong, China)
PP-1062	Tips and Pitfalls of Intraoperative Direct Spleno-renal Shunt Ligation at Liver Transplantation in Patients with Big Spleno-renal Shunt	Kyung Chul Yoon (Korea)
PP-1101	Outflow reconstruction using the homologous venous grafts in living donor liver transplantation: Experience at the University of Tokyo Hospital.	Yuichiro Mihara (Japan)

15:20-16:20	**Poster Presentation 3**	Grand Ballroom 3
	CHAIRPERSONS: Choon Hyuck David Kwon (Korea), Chih-Chi Wang (Taiwan)	
PP-1143	Real-Life Effectiveness of Different Antiviral Therapy Regimens in Treatment of HDV-Infection	Kakharman Yesmembetov (Kazakhstan)
PP-1063	Enhanced formation of 3D printed hepatic structure with HepG2 cell line by 3d printing technique	Dooin Lee (Korea)
PP-1160	Initial Experiences in Living Donor Liver Transplantation at Astana City Hospital No. 1	Abylay Donbay (Kazakhstan)
PP-1038	Excellent outcomes of living domino liver transplantation using explanted donor livers from maple syrup urine disease patients	Hiroyuki Kanazawa (Japan)
PP-1082	Adverse events after liver transplantation and associated factors for liver donors: a nationwide study in Taiwan	Chien-Chang Liao (Taiwan)
PP-1034	Should Branch Portal Vein Tumor Thrombosis Be an Absolute Contraindication for Liver Transplantation in Patients With Hepatocellular Carcinoma?	Prashant Bhangui (India)
15:20-16:20	**Poster Presentation 4**	Grand Ballroom 3
	CHAIRPERSONS: Mureo Kasahara (Japan), Mohamed Rela (India)	
PP-1035	Intrapulmonary shunting on macro-aggregated albumin scans in children undergoing liver transplantation for chronic liver disease	Vidyadhar Mali (Japan)
PP-1137	The role of pretransplant therapy for hepatocellular carcinoma in a living donor liver transplantation program	Taizo Hibi (Japan)
PP-1033	Venous reconstruction using the recipient's portal vein as venous patch grafts in pediatric living donor liver transplantation	Jinzhen Cai (China)
PP-1055	Hepatic Histologic Change After Weight Reduction in Potential Living Liver Donors with Fatty Liver	YoungRok Choi (Korea)
PP-1067	Donor and recipient lipid profile of liver transplantation - like father like son	Kevin Ka Wan Chu (Hong Kong, China)
PP-1148	Liver fetal cell therapy as a promising approach for patients with end-stage liver disease on the waiting list	Akhmet Seidakhmetov (Kazakhstan)

POSTERS

PP-1004	Aspergillous osteomyelitis post liver transplantation	Rakesh Rai (India)
PP-1005	De novo hepatocellular cancer following living donor liver transplant.	Rakesh Rai (India)
PP-1007	The possibility of radiotherapy as downstaging to living donor liver transplantation for hepatocellular carcinoma with portal vein tumor thrombus	Jin Yong Choi (Korea)
PP-1009	Surgical planning for dual graft living donor liver transplantation using a right posterior sector and a left lobe: a case presentation	Qigen Li (China)
PP-1011	Outcome of rituximab-based desensitization protocol without local infusion therapy for ABO incompatible living donor liver transplantation at single center experience	Takahiro Murokawa (Japan)
PP-1012	Biliary anastomosis complications after living donor liver transplantation in mongolia	Bat-Ireedui Badarch (Mongolia)
PP-1013	Prospective pilot study of living donor liver transplantation for patients with HCC exceeding milan criteria	Mihai-Calin Pavel (Spain)
PP-1014	Segment 4b and segment 8 liver resection	Muhammad Wahla (Pakistan)
PP-1016	Alveolar hemorrhage in pneumonia after liver transplantation	Adianto Nugroho (Korea)
PP-1018	Total internal biliary diversion during living donor liver transplantation for paediatric progressive familial intrahepatic cholestasis type 1: A unique approach using the caudal end of the roux-en-Y jejunum	Vidyadhar Mali (Japan)
PP-1019	Donor age over than 55 years old in living donor liver transplantation	SeungHwan Lee (Korea)
PP-1020	Living donor liver transplantation across ABO blood group barrier in infantile end-stage liver diseases	Qiu Bi Jun (China)
PP-1022	ABO incompatible living donor liver transplantation: two cases report	Guoyong Chen (China)
PP-1023	Our experience in liver transplantation	Daniyar Toksanbayev (Kazakhstan)
PP-1024	De novo malignancy within one year after LDLT ; Case report	Joo Kim (Korea)
PP-1025	Pediatric hepatocellular carcinoma - outcomes	Kumar Palaniappan (India)
PP-1026	Rejection crisis after liver transplantation	Shokan Kaniyev (Kazakhstan)
PP-1030	Biliary complication after living donor liver transplantation according to biliary reconstruction methods	Jae Geun Lee (Korea)

PP-1031	Posthepatectomy liver failure: impact of glissonean pedicle transection method. single institution experience.	Enkhamgalan Tsiiregzen (Mongolia)
PP-1037	Is large orifice the only solution to prevent outflow disturbance in right lobe living donor liver transplantation? : New simplified one-orifice venoplasty	Joo Dong Kim (Korea)
PP-1039	The challenges of starting living donor liver transplant (LDLT) program in indonesia	Toar Lalisang (Indonesia)
PP-1041	Liver transplantation in viral hepatitis b and c	Maxat Doskhanov (Kazakhstan)
PP-1042	Post-liver transplant follow up: experience at a tertiary care center	Mudassir Laeeq (Pakistan)
PP-1044	Successful experiences of ABO-incompatible adult living donor liver transplantation for high-urgency patients in a single institute	Seok-Hwan Kim (Korea)
PP-1045	Acute graft versus host disease after liver transplantation: single center experience and review of literature	Woo-Hyoung Kang (Korea)
PP-1048	Liver transplantation(LT) is a treatment option to rescue patients with budd-chiari syndrome(BCS) non responsive to either medical or surgical therapy.	Seok-Hwan Kim (Korea)
PP-1049	ABOi LDLT for HCC	Youngin Yoon (Korea)
PP-1050	Does that really mean that living donor liver transplantation as the treatment of intrahepatic cholangiocarcinoma?-single center experience	Wan-joon Kim (Korea)
PP-1051	Outcome and technical feasibility of hepatic re-transplantation at a large volume living donor liver transplantation center	Wan-joon Kim (Korea)
PP-1052	Portal vein stenting is a significant risk factor for biliary stricture in adult living donor liver transplantation: matched case-control study	Min Ho Shin (Korea)
PP-1053	Long-term outcome of ischemia-type biliary stricture after endoscopic treatment in liver living donors	Jae Hyun Kwon (Korea)
PP-1054	Vena caval replacement with cadaveric caval graft for living donor liver transplantation in budd-chiari syndrome associated with hydatid cyst surgery: a case report.	Deniz Balci (Turkey)
PP-1057	predictors of response to interferon / ribavirin therapy in patients with hepatitis c virus infection at upper egypt	Aly Kassem (Egypt)

PP-1058	Cost-effectiveness and convenience of myrept® 500 mg tablet in recipients after liver transplantation	Suk Kyun Hong (Korea)
PP-1059	Alterations of hepatocellular bile salt transporters and effects of immunosuppressants after warm ischemic injury in rats	Hyeyoung Kim (Korea)
PP-1060	Gastrointestinal congestion dilates liver artery	Zhongping Cao (China)
PP-1061	Conjoined unification venoplasty for graft double portal vein branches as a modification of autologous Y-graft interposition	Eunkyoung Jwa (Korea)
PP-1083	Factors associated with increased medical expenditure and prolonged length of stay after transplantation for liver donors in Taiwan	Yi-Chun Chou (Taiwan)
PP-1102	liver transplantation program in JSC "National research center for oncology and transplantology"	Yermakhan Assylkhanuly (Kazakhstan)
PP-1103	Producing artificial bile duct by 3D printers in rabbits	Dooin Lee (Korea)
PP-1114	Prevalence and related factors of fatigue after liver transplantation	Hyo-Sin Kim (Korea)
PP-1115	A case report of drug-induced thrombocytopenia after living donor liver transplantation	Keisuke Arai (Japan)
PP-1116	Establishment of a new transplant program in Kazakhstan: experience of 11 years	Mels Assykbay (Kazakhstan)
PP-1117	Effects of tolvaptan in the early postopertive stage after living donor liver transplantation	Shunichi Imai (Japan)
PP-1124	Cases of paediatric living donor liver transplantation : the role of radiology in detection of complications after liver transplant	Damayanti Sekarsari (Indonesia)
PP-1126	Successful management of HAT after LDLT in the city clinical hospital No. 7	Farabi Stamkulov (Kazakhstan)
PP-1131	200 A-P criteria for indication of liver transplantation for hepatocellular carcinoma	Kwangho Yang (Korea)
PP-1132	Donor safety in adult living donor liver transplantation: single center experience in Algeria.	Kamel Bentabak (Algeria)
PP-1133	Rituximab only protocol for ABO incompatible living donor liver transplantation without antibody removal	Seung Duk Lee (Korea)
PP-1134	Analysis of the liver volumes of korean adults using dr. liver	Jae Do Yang (Korea)

PP-1136	Prognostic factors predicting fatal outcome after living donor liver transplantation for fulminant hepatic failure	Tae-Seok Kim (Korea)
PP-1140	Unexpected thrombotic occlusion of splenorenal shunt after ligation of left renal vein in LDLT	Young Seok Han (Korea)
PP-1144	X-ray endovascular intervention in portal hypertension	Adilbek Mukazhanov (Kazakhstan)
PP-1145	The results of transarterial chemoembolization for malignant liver tumors	Assan Zheksembayev (Kazakhstan)
PP-1147	Liver regeneration kinetics in donor and recipients after living donor liver transplant	Shailesh Sable (India)
PP-1150	The role of international collaborative program in development of adult-to-adult living-donor liver transplantation program in National Scientific Medical Research Center	Marlen Doskali (Kazakhstan)
PP-1151	Impact of malignancy on survival after liver and kidney transplant patients: dalin tzu chi hospital experience	Wen-Yao Yin (Taiwan)
PP-1152	Dual hepatic artery reconstruction in living donor liver transplantation	Siddachari Ravichand Chamarajanagar (India)
PP-1156	Experience with different embolic agents in the treatment of tumors of hepatopancreatoduodenal area	Chokhan Aitbayev (Kazakhstan)
PP-1157	The correlation between pre-operative volumetry and real graft weight: comparison of two volumetry programs.	Nadiar Mussin (Korea)
PP-1158	Estimation of fat by MR in donors of living donor liver transplantation	Guruprasad Shetty (India)
PP-1159	Outcomes of treatment of acute liver failure due to yellow phosphorus poisoning	Ravi Mohanka (India)
PP-2000	Risks and treatment strategies for de novo hepatitis B virus infection from anti-HBc-positive donors in pediatric living donor liver transplantation	Gao Wei (China)
PP-2001	The effect of living donor liver transplantation to patients with hepatic myelopathy	Guo Qingjun (China)
PP-2002	Evaluation of donor safety and graft anatomic variations for right lobe living donor liver transplant	Jiang Wen-tao (China)
PP-2003	The management of ABO-incompatible pediatric living donor liver transplantation: the experience of a single center.	Ma Nan (China)

CHAIRPERSONS

NAME	AFFILIATION	COUNTRY
Rey-Heng Hu	National Taiwan University	Taiwan
Dong Goo Kim	Seoul St. Mary's Hospital, Catholic University of Korea	Korea
Soon-Il Kim	Severance Hospital, Yonsei University College of Medicine	Korea
Suk-Koo Lee	Samsung Medical Center, Sungkyunkwan University	Korea
Sung-Gyu Lee	Asan Medical Center, Ulsan University	Korea
Motohide Shimazu	Keio University	Japan
Kyung-Suk Suh	Seoul National University Hospital	Korea
Hee-Jung Wang	Ajou University Hospital	Korea
Ku Yonson	The University of Kobe	Japan

INVITED SPEAKERS

See Ching Chan

AFFILIATION

Department of Surgery, The University of Hong Kong, Queen Mary Hospital, Hong Kong, China

BRIEF CV

Prof. Chan graduated from The University of Hong Kong with a degree of BDS in 1985 and that of MBBS in 1995. He joined the Department of Surgery for surgical training in 1996. Soon after his promotion to Consultant in 2007, he was appointed Clinical Professor of the University in 2011 and is now Chief of the Division of Liver Transplantation. He is a high achiever strongly committed to excellence and his accomplishments in all respects of his career have been exemplary.

Professor Chan has an innovative spirit in research. He completed 3 doctoral degrees viz. the Master of Surgery in 2005 and the Doctor of Philosophy in 2011, and Doctor

of Medicine in 2013. He has enjoyed good collaborative relationships with local and international researchers as principal and co-investigators. He is a Principal Investigator of the University's State Key Laboratory of Liver Research. Professor Chan has been a sustained contributor of high quality research evidenced by an impressive research output of 200 articles in first-class journals of high impact factors and 10 book chapters. Among his publications, 3 papers on living donor liver transplantation published in the Annals of Surgery and the American Journal of Transplantation respectively have been widely cited and made a significant impact to the transplant community. In 2005 he received the State Scientific and Technological Progress (SSTA) First-class Award from the National Office for Science and Technology Awards. On the ISI Essential Science Indictors 2012, 2013 and 2014, he is among the top 1% most cited scholars in Clinical Medicine. His recognition is evidenced by the regular invitations to speak at important local and international meetings, and his service on editorial board of prestigious journals including Hepatobiliary & Pancreatic Diseases International and World Journal of Transplantation and Liver Cancer. On teaching, Professor Chan is a keen and engaging teacher and is well regarded. He spends a great effort on medical education and training of interns and junior surgeons. Lectures on liver transplantation and bioethics of organ transplantation are delivered regularly. He serves on the Quality Assurance Sub-committee of the Medical Curriculum of the Li Ka Shing Faculty of Medicine. He frequently lectures for various medical and nursing courses. Currently he supervises one PhD and one Master of Science candidates. He is also a mentor of 9 local and overseas liver transplant fellows at Queen Mary Hospital. His commitment has contributed much to the quality of education and training in the Department.

RESEARCH INTERESTS

Small-for-size graft liver transplantation
Bioethics of living donor liver transplantation
Immune competency of liver recipients
Critical role of liver transplantation for hepatocellular carcinoma

Pham Huu Thien Chi

AFFILIATION

Department of Hepato-Bilio Pancreatic Surgery, ChoRay Hospital, Vietnam

BRIEF CV

Prof. Chi graduated from Hue University of Medicine and Pharmacy (Hue city) in 1985. He has worked at Cho Ray Hospital (at Ho Chi Minh City) since 1994 in Department of General Surgery, then Gatrointestinal Surgery, Hepato Bilio Pancreatic Surgery. As a consultant of HBP ad GI surgery of Cho Ray Hospital, he is also lecturer of Department of Surgery - University of Medicine and Pharmacology at Ho Chi Minh City. Since 2010, he has participated the liver transplantation program of Cho Ray Hospital supported by the Ministry of Health of Vietnam and Asan Medical Center (Seoul-Korea).

RESEARCH INTERESTS

1. Diagnosis and treatment of duodenopancreatic injuries – Pham Huu Thien Chi et al - Y hoc TP. Ho Chi Minh* – Vol. 8 – Supplement of No 3 – 2004:1-8.
2. Early results of transhiatal esophagectomy in treatment of cancers of cardia and lower third of esophagus. Pham Huu Thien Chi, Le Quang Nghia * Y Hoc TP. Ho Chi Minh * Vol. 10 - No 3- 2006: 142 – 146.
3. Esophageal replacement in surgical treatment for cancers of cardia and lower third of esophagus. Pham Huu Thien Chi, Le Quang Nghia * Y Hoc TP. Ho Chi Minh * Vol. 11 – Supplement of No1 - 2006: 142 – 146.
4. Bile leaks after hepatobiliary operation. Nguyen Tan Cuong, Pham Huu Thien Chí et al, Y Hoc TP. Ho Chi Minh * Vol. 12 - Supplement of No 4 - 2008: 160 – 165.
5. Evaluation of pancreatic fistula result at Cho Ray hospital for 5 years. Nguyen Tan Cuong, Pham Huu Thien Chi, et al, Y Hoc TP. Ho Chi Minh * Vol. 12 - Supplement of No 4 – 2008, 119 – 125.
6. Treatment of liver trauma by transcatheter arterial embolisation (TAE) with spongel. Le Truong Chien, Pham Huu Thien Chi, Nguyen Tan Cuong * Y hoc TP. Ho Chi Minh * Vol 13 - Supplement of No 1 - 2009:24-28.
7. Initial results of laparoscopic distal pancreatectomy. Nguyen Tan Cuong, Pham Huu Thien Chi et al, Vietnam Journal of Endolaparoscopic Surgery -Vol 1 (3)2013, 26-33.

Zhaksylyk Doskaliyev

AFFILIATION

Department of Organ and Tissue Transplantation, Astana Medical University, Kazakhstan

BRIEF CV

Prof. Doskaliyev graduated from Aktobe State Medical Institute (Aktobe city, Kazakhstan) in 1979. From 1986-1988 - residency in National Surgery Center (Moscow, USSR). In 1989 he defended the candidate of medical science degree. From 1991-1998 he was a head of surgery department in Scientific Center of Surgery named after Syzganov (Almaty city). In 1994 he defended the doctoral of medical science degree. In 1996 he got the Professor degree from the Academy of Sciences of the Republic of Kazakhstan. From 1998-2011 he was as a head of several medical universities, as a head of Helth Ministry of Kazakhstan. From 2013 as a chief of Transplant Program in Kazakhstan he becomes a head of Republic Coordintation Center for Transplantation. He is also Professor and as a hepatic and transplant surgeon in the Department of Surgery, Organ and Tissue Transplantation in National Scientific Medical Research Center, Astana city.

RESEARCH INTERESTS

He is interesting in organ transplantation (kidney, pancreas and liver), hepatopancreatobiliary diseases and surgery, immune cell therapy for end-stage diseases, some aspects of general surgery.

Hiroto Egawa

AFFILIATION

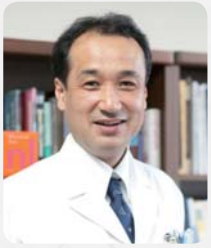
Department of Surgery, Tokyo Women's Medical University, Japan

BRIEF CV

Prof. Egawa graduated from Kyoto University in 1982 and was trained as a HPB surgeon. He participated initial program of LDLT at Kyoto University, and then spent 3 years to learn DDLT at California Pacific Medical Center in USA (1991-1994). He worked at Kyoto from 1994 to 2009, and Gifu from 2009to 2011 as a HBP and transplant surgeon. Heis a professor in the Department of Surgery, Tokyo Women's Medical University, Tokyo, Japan since 2011.

RESEARCH INTERESTS

Surgery in liver transplantation
Infectious complications
Antibody mediated rejection
Long term complication after liver transplantation



Susumu Eguchi

AFFILIATION

Department of Surgery, Nagasaki University Graduate School of Biomedical Sciences, Japan

BRIEF CV

Prof. Eguchi graduated from Nagasaki University. He was at Cedars-Sinai, Medical Center LA with Prof. Suh from 1994-1997 and Groningen University Hospital as an LT fellow from 2003-2005. He has been in Nagasaki University Graduate School of Biomedical Sciences, Japan as a HPB surgery and liver transplant surgeon since 2005. He was a professor appointed in 2014.

RESEARCH INTERESTS

Liver transplantation, HPB Surgery
Liver regeneration, Hepatocyte-based therapy
Regenerative Medicine

Johnny C. Hong

AFFILIATION

Department of Surgery, Medical College of Wisconsin, USA

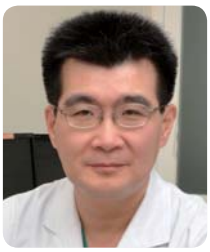
BRIEF CV

Johnny C. Hong, MD, FACS, is Associate Professor of Surgery, holds the inaugural Mark Adams Chair in Surgery and Chief, Division of Transplant Surgery at the Medical College of Wisconsin, Milwaukee, Wisconsin, USA. Dr. Hong also serves as Director, Solid Organ Transplantation Service Line, a joint program of Froedtert & Medical College of Wisconsin, Children's Hospital of Wisconsin, and BloodCenter of Wisconsin.

Dr. Hong completed a general surgery residency as well as an immunology and organ transplantation fellowship at the University of Texas Houston Health Science Center, Houston, Texas, USA. He obtained additional fellowship training in multi-organ transplantation and hepatobiliary surgery at the University of California, Los Angeles (UCLA), USA. Dr. Hong is a highly-accomplished and innovative clinician and researcher. His clinical expertise encompasses the entire spectrum of liver transplantation and hepatobiliary surgery for adults and children. In addition, he is recognized for his expertise in the surgical management of benign and malignant liver and bile duct diseases and tumors.

RESEARCH INTERESTS

Dr. Hong is widely published in the peer-reviewed literature and maintains a research laboratory focusing on organ resuscitation to mitigate the adverse effects of ischemia and reperfusion injury. His innovative work on liver resuscitation, through regulated hepatic reperfusion, aims to convert otherwise discarded marginal deceased donor organs to transplantable livers, in the hopes of decreasing the number of patient deaths while on the transplant waitlist.



Shin Hwang

AFFILIATION

Department of Surgery, Asan Medical Center, Ulsan University, Korea

BRIEF CV

- Professor of Surgery, College of Medicine University of Ulsan, Asan Medical Center, Seoul, Korea
- Director, Organ Transplantation Center, Asan Medical Center
- Chief, Liver Cancer Center, Asan Medical Center
- Working as a faculty member of hepatobiliary surgery and liver transplantation at the Asan Medical Center since 1998
- Working as a visiting researcher at the Emory University Hospital in 2005
- Publishing more than 150 articles on hepatobiliary surgery and liver transplantation
- Chief Editor, Journal of Korean Hepatobiliary and Pancreatic Surgery

RESEARCH INTERESTS

Liver transplantation

Hepatocellular carcinoma

Cholangiocarcinoma

Stem cell therapy

Ischemia-reperfusion injury

Toru Ikegami

AFFILIATION

Department of Surgery and Science, Kyushu University, Japan

BRIEF CV

Prof. Toru Ikegami is from Kyushu University, Fukuoka, Japan. Fukuoka is the biggest city in Kyushu island, which is the most west part of Japan. Thus Fukuoka is located very close to Busan and it is just 50 minutes flight from Fukuoka to Busan. He was graduated from Kyushu University in 1994, and trained as Liver transplant fellow by Prof. Katsuhiko Yanaga after surgical residency. He was also trained by Prof. Goran Klintmalm as a clinical transplant fellow for two years at Baylor University Hospital at Dallas, Texas from 2004 to 2005. Since 2006, He has been involved in the liver transplant team at Kyushu University Hospital. He performs around 50 living donor liver transplantation (LDLT) annually, including left lobe in two-thirds, right lobe in one-third, and a few posterior segment. Recently, he has been largely influenced by refined LDLT techniques originated from Korea both in donor and recipient sides. This time, he would like to report his recent techniques and pitfalls in LDLT donor surgeries.

RESEARCH INTERESTS

Because he is a surgeon, he has been mostly interested in donor and recipient surgeries, especially bloodless donor surgeries via midline incision, efficient recipient heaptectomy techniques, and venous reconstruction techniques in LDLT. Otherwise, he has been interested and involved in antiviral treatment for recurrent hepatitis C using direct acting agents.

Jae-Won Joh

AFFILIATION

Department of Surgery, Samsung Medical Center, Sungkyunkwan University, Korea

BRIEF CV

Born in Seoul, Korea. Graduated Seoul National Univ. Medical College in 1982 and Trained in same hospital in the Department of Surgery until 1987. After 3 years of military service and one year fellowship in Seoul National Univ. Hospital, Joined Chungbuk National Univ. as an Instructor in Surgery in 1991. 1992-1994 Fellowship in Johns Hopkins Hospital and Virgina Common Wealth Univ. Hospital. Jonied Samsung Medical Center in 1994. Became Professor of Surgery, SungKyunKwan Univ. School of Medicine in 2002. Director of Organ Transplant Center of Samsung Medical Center in 2009. Doing over one hundred liver surgery and one hundred thirty liver transplantations in a year. Main author of more than 100 PubMed registered journal paper.

RESEARCH INTERESTS

HCC

Transplantation

Toshimi Kaido

AFFILIATION

Department of Hepato-Biliary-Pancreatic and Transplant Surgery, Kyoto University, Japan

BRIEF CV

Prof. Kaido graduated from Kyoto University in 1987 and Kyoto University Graduate School of Medicine in 1996.

He has been an associate professor in the Department of Hepato-Biliary-Pancreatic and Transplant Surgery since 2009. He thinks change and innovation are essentials for advances in every field including medicine.

In addition, his policy in medical practice is "Patients' benefit", in other words, to introduce beneficial things for patients actively, and to change or stop bad things for patients rapidly. So, he would like to continue change and innovation in various fields with passion.

RESEARCH INTERESTS

Outcome research in liver transplantation

Multimodal treatment for hepatocellular carcinoma

Perioperative nutritional assessment and treatment

Sarcopenia

Perioperative management and ERAS

Sang-Mo Kang

AFFILIATION

Department of Surgery, University of California, San Francisco, USA

BRIEF CV

Prof. Kang received his B.S. in Chemistry from Cornell University, and his M.D. from Harvard University Medical School. He then completed his general surgery residency, as well as the immunology and clinical transplantation fellowships at the University of California, San Francisco (UCSF). He joined the UCSF School of Medicine faculty as an organ transplant surgeon in 2001 and was named Surgical Director of Intestinal Rehabilitation and Transplantation at UCSF Medical Center in 2005. He perform kidney, liver, pancreas and intestinal transplants, as well as surgery for numerous hepatobiliary and gastrointestinal diseases, in both adult and pediatric patients.

RESEARCH INTERESTS

His laboratory is focused upon understanding the fundamental immunology underlying transplantation rejection and tolerance. They have developed a powerful T-cell receptor transgenic model of alloimmunity that has been useful for studying the role of naturally occurring and adoptively transferred regulatory T cells in the induction of allospecific tolerance. Currently, they are studying a profound but poorly understood phenomenon in transplantation: spontaneous liver transplant tolerance. They have also studied the role of donor reactive regulatory T cells in various transplant models and studied their potential therapeutic use in organ transplant models. They are currently translating this work to clinical trials, and he is a principle investigator on two ongoing safety trials of donor reactive regulatory T cells in de novo renal transplantation as well as liver transplantation.

Mureo Kasahara

AFFILIATION

Organ Transplantation Center, National Center for Child Health and Development, Japan

BRIEF CV

Prof. Kasahara has been with NCCHD, Tokyo as a transplant surgeon since 2005. He has over 1300 pediatric liver transplant experience, doing 70 cases of pediatric LDLT annually in NCCHD, which covered 70% of all Japanese Pediatric liver transplantation.

RESEARCH INTERESTS

Pediatric liver transplantation

Organ preservation

Split liver transplantation

Ki-Hun Kim

AFFILIATION

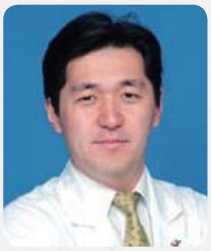
Department of HB Surgery and Liver Transplant, Asan Medical Center, Ulsan University, Korea

BRIEF CV

Dr. Ki-Hun Kim is currently a professor and chief of division of Liver transplantation and Hepatobiliary surgery at Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea. He graduated from Korea University College of Medicine in 1992 where he earned PhD degree in 2003, and completed a surgical resident training in Korea University hospital in 1998. He completed a fellowship training of Hepatobiliary surgery and Liver transplantation at Asan Medical Center. He was an instructor of Department of Surgery at Seoul Baik Hospital, University of Inje, Korea in 2001, a visiting professor of Surgery at Kobe University Hospital, Kobe, Japan in 2006, and participated in the Multivisceral Transplantation Program as a visiting professor at Miami Transplant Institute, University of Miami, USA in 2007. He has been a faculty member of Surgery at Asan Medical Center since 2002. He is a member of ILTS, IHPBA, APHPBA, IASGO, KMS, KAHPBS, KSOT, KASL, KSELS, and KLTSG. He published more than 190 scientific articles in national and international journals.

RESEARCH INTERESTS

Liver transplant
Laparoscopic liver resection
Immune therapy



Choon Hyuck David Kwon

AFFILIATION

Department of Surgery, Samsung Medical Center, Sungkyunkwan University, Korea

BRIEF CV

Prof. Kwon's medical education and surgical training including liver transplant fellowship were all done in Korea at Seoul National University and Samsung Medical Center. He is an expert in liver transplantation and laparoscopic liver resections. He has performed more than 650 laparoscopic liver resection including more than 40 totally laparoscopic donor hepatectomy for adult living donor liver transplantation, having the largest clinical series in the world. He participated in the development of the first and only bioartifical liver support system in Korea. He is a board member of The Korean Association of HBP Surgery, The Korean Society for Transplantation, The Korean Liver Transplantation Study Group, The Korean Laparoscopic Surgery Study Group and The International Living Donor Liver Transplantation Study Group.

RESEARCH INTERESTS

- Minimally invasive liver surgery
- Bioartificial liver support system
- Living donor liver transplantation

Kwang-Woong Lee

AFFILIATION

Department of Surgery, Seoul National University Hospital, Korea

BRIEF CV

Prof. Kwang-Woong Lee graduated from Seoul National University. He was a hepatic and transplant surgeon at Samsung Medical Center and National Cancer Center, Korea. He has also been a LDLT consultant in Johns Hopkins University Hospital. He is now an executive director of the International Health Care Center and a Professor of the Department of Surgery, Seoul National University, Korea. He performed the first successful hepatocyte transplantation in Korea when he was at Samsung Medical Center. He performed the first living donor liver transplantation in pure foreign patients in Korea when he was at the National Cancer Center, Korea, He has also performed more than 35 cases of LDLT in Kazakhstan and Georgia since 2013. He is currently involved as a principal investigator in a randomized study regarding the efficacy of mTORi on the HCC recurrence after LDLT.

RESEARCH INTERESTS

- Hepatocyte transplantation
- Gene delivery into the liver
- Cancer stem cell
- Best Immunosuppressants for HCC
- Bile duct ischemia induced by warm ischemia
- Polymorphisms

Jan Lerut

AFFILIATION

Department of Abdominal and Transplantation Surgery, University Hospitals Saint Luc, Brussels, Belgium

BRIEF CV

Prof. Lerut, MD, PhD trained in General Surgery at the Katholieke Universiteit Leuven (KUL) (B) under the lead of Prof.Jacques A.GRUWEZ and at the H.Heine University of Dusseldorf (G) under the lead of Prof.Karl KREMER and at the Université catholique de Louvain (UCL) (B) under the lead of Prof.Paul Jacques KESTENS.

From the very start of his surgical career he was involved in organ transplantation. This interest resulted in a transplantation fellowship at the Universities Paris-Sud-Centre Hépatobiliaire Paul Brousse under the lead of Prof. Henri BISMUTH and at Pittsburgh Medical Centre under the lead of Prof. Thomas E.STARZL. He was director of the abdominal transplant program at the Inselspital University of Bern (CH) from 1987 to 1991 (Prof. Leslie H.BLUMGART)

Currently he is ordinary Professor of Surgery and Co-director of the Department of Abdominal and Transplantation Surgery as well as Director of the Starzl Abdominal Transplant Unit of the University Hospitals Saint Luc and of the UCL Transplant Centre in Brussels.

He has served as president of the Belgian Society of Transplantation (BST), as chairman of the Eurotransplant (ET) Liver Allocation Committee (ELIAC) and as President of the European Society for Organ Transplantation (ESOT). He is member of different councils and learning societies related to surgery and transplantation as well of the Belgian Superior Health Council. He is active in the EUROLIVER Foundation awareness campaigns for adolescents in relation to organ donation.

Under his Presidency of the ELIAC, the MELD system was introduced within the ET community. His presidency of ESOT was devoted to the broadening of the European transplant community and to the development of a master educational program in the field of transplantation.

He is a member of 22 learning societies. He is the actual president of International Liver Transplant Society (ILTS) and of the Royal Belgian Society for Surgery (RBSS). He was congress-chair of the very successful ESOT 2015 congress in Brussels.

He authored more than 300 peer-reviewed articles, 24 books chapters and 24 scientific films. He made more than 600 communications on national and international congresses, most of them devoted to liver transplantation. He recently co-edited the book Regenerative Medicine Applications in Organ Transplantation (Academic press).

RESEARCH INTERESTS

His research interests focus on the development of technical refinements in liver transplantation, the value of liver transplantation in hepato-biliary oncology; the use of minimal immunosuppression and tolerance induction in liver transplantation.

Chih-Che Lin

AFFILIATION

Department of Surgery, Chang Gung Memorial Hospital, Taiwan

BRIEF CV

Prof. Lin graduated from Kaohsiung Medical University of Taiwan and has been a hepatic and transplant surgeon since 2000. He also qualified PhD from Imperial College London, focusing on xenotransplantation and transplantation immunology. Then he was as a research Postdoc in Thomas Starzl Institute, University of Pittsburgh Medical Center. Currently, he is an associate professor and director in Department of Surgery in Kaohsiung Chang Gung Memorial hospital, Taiwan.

RESEARCH INTERESTS

Hepatocellular carcinoma

surgical techniques and patient care of liver transplantation

Chung-Mau Lo

AFFILIATION

Department of Surgery, The University of Hong Kong, Hong Kong, China

BRIEF CV

Prof. Lo is Chin Lan-Hong Professor and Chair of Hepatobiliaryand Pancreatic Surgery as well as Head of the Department of Surgery at The University of Hong Kong. He is internationally renowned for his expertise in hepatobiliary surgery, liver cancer and liver transplantation. He has published over 440 original articles in refereed national and international journals, and authored 12 book chapters.

His pioneering work in adult right lobe living donor liver transplantation has revolutionalized the practice of liver transplant world-wide and has put Hong Kong and Chinaon the world map of liver transplant. As a result, he and his team were awarded China's top national honor of First-class State Scientific and Technological Progress Award in 2005 and First-class Award in Research Achievements Ministry of Education of ThePeople's Republic of China in 2013. His academic standing in the field of surgery in general and liver transplantation in particular, is duly recognized by his appointment in various international professional organizations and in the editorial board of top journals in the field of surgery and transplantation. He was the President of the International Liver Transplantation Society

and the International Society for Digestive Surgery. He has served as a Deputy Editor of Liver Transplantation, an Associate Editor of the American Journal of Transplantation and World Journal of Surgery, and an editorial board member of the Annals of Surgery and Surgery. He has been elected as an Honorary Fellow of the American Surgical Association and the American College of Surgeons, as well as an Honorary Member of the European Surgical Association.

In recognition of his contribution to public services, Professor Lo has been appointed as Justice of Peace by the Government of Hong Kong SAR since 2012.

RESEARCH INTERESTS

Hepatobiliary and Pancreatic Surgery & Liver Transplantation

Deok-Bog Moon

AFFILIATION

Department of Hepato-Biliary Surgery and Liver Transplantation, Asan Medical Center, Ulsan University, Korea

BRIEF CV

Deok-Bog Moon, MD is the Professor, Hepato-Biliary Surgery and Liver Transplantation, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea.

He completed resident courses of General Surgery in 1997. Since 2001, he has been specialized in Hepato-Biliary Surgery and Liver Transplantation at Asan Medical Center.

He is Hepato-Biliary and Liver Transplantation surgeon, working as a team-member of at Hepato-Biliary Surgery and Liver Transplantation unit with esteemed Professor Sung-Gyu Lee, at Asan Medical Center, Seoul, Korea.

In liver transplantation, his major is recipient surgery including heaptectomy & implantation & hepatic artery anastomosis under microscope. The technique learned from liver transplantation is also very useful to perform hepato-biliary surgery. Therefore, his main interest is to perform the challenging operation which was inoperable before introduction of techniques used for liver transplantation.

RESEARCH INTERESTS

Hepatocelluar Carcinoma and Liver Transplantation, Biliary and Pancreatic surgery.

The 2nd International Congress of
Living Donor
Liver Transplantation
Study Group
(ILDLT Study Group 2015)

John Gerard O'Grady

AFFILIATION

Department of Hepatology and Transplantation, King's College Hospital, United Kingdom, United Kingdom

BRIEF CV

Prof. O'Grady is working as a consultant hepatologist and honorary senior lecturer at King's College Hospital from 1669. He finished his Surgical internship and research fellow at Regional Hospital Galaway in Ireland. He is member of British Society of Gastroenterology, British Association for the Study of the Liver, European Association for the Study of the Liver, American Association for the Study of the Liver, International Liver Transplantation Society and International Liver Cancer Association.

RESEARCH INTERESTS

Liver Transplantation

Kim Olthoff

AFFILIATION

Department of Surgery, Hospital of the University of Pennsylvania, USA

BRIEF CV

Prof. Olthoff joined the surgical faculty at the University of Pennsylvania in 1995. Prior to coming to Penn, she attended the University of Chicago Pritzker School of Medicine, and completed a residency in general surgery and a fellowship in transplantation and hepatobiliary surgery at UCLA. She is the Chief of the Division of Transplant Surgery at the University of Pennsylvania and Co-Director of the Transplant Center at the Children's Hospital of Philadelphia, and the surgical director of the liver transplant programs at both hospitals. Her clinical practice focuses on adult and pediatric liver transplantation, living donor transplantation, and hepatobiliary surgery. She is a past president of the ASTS, past board member and committee chair of UNOS, and a former deputy editor for Liver Transplantation.

RESEARCH INTERESTS

She has an active research effort in both basic/translational and clinical research and is a recipient of NIH funding for studies in liver regeneration and living donor transplantation, focusing on the molecular pathways involved in restoration of liver function and mass in the transplant setting. She has been the PI for the A2ALL study at our center. She is also involved in studies attempting to determine who are the best recipients of LD and DD livers, and efforts to establish better means of allocating livers.

Sergelen Orgoi

AFFILIATION

Department of Surgery, Health Sciences University of Mongolia, Mongolia

BRIEF CV

Prof. Orgoi graduated Mongolian National University of Medical Science (MNUMS) in 1982. She has been with FCH, Mongolia as a hepatic and transplant surgeon since 2007. She is also a professor in the Department of Surgery, MNUMS since 2002. She worked as a leader of liver transplantation team and a director of Organ Transplantation Center of Mongolia. LT project started with ASAN Medical Center of South Korea in 2010. Since 2010 they have done 22 cases of LDLT with ASAN Medical Center and 2 cases have done by their Mongolian LT team.

RESEARCH INTERESTS

- Establish stem cell treatment for Diabetes in Mongolia and analyze the causes, treatment outcome.
- Start the living donor liver transplantation project in Mongolia, its developing surgical techniques and control patient after operation.
- Strengthening emergency and essential surgical care in rural hospitals of Mongolia.
- Develop laparoscopy Mongolian countryside hospitals.

Elizabeth Anne Pomfret

AFFILIATION

Department of Transplantation and Hepatobiliary Diseases, Lahey Clinic, USA

BRIEF CV

Elizabeth A. Pomfret, MD, PhD is the Chair of the Department of Transplantation and Hepatobiliary Diseases at the Lahey Hospital and Medical Center in Burlington, Massachusetts and is Professor of Surgery at Tufts University School of Medicine in Boston. She is an established multi-organ transplant surgeon with additional surgical training in Live Donor Liver Transplantation. Dr. Pomfret is an international leader within the field of transplantation, currently serving the Executive Editor of Transplantation, the most highly cited journal in the field of organ transplantation. She served as the President of the International Liver Transplantation Society (ILTS) from 2014-2015 and as the Chair of the program planning committee for the 2014 International Congress of ILTS, ELITA and LICAGE meeting in London this past year and the 2015 International Liver Transplantation Society meeting in Chicago.

RESEARCH INTERESTS

Dr. Pomfret has a long history of interest in education and initiated a plan for creating and implementing a standardized curriculum for transplant surgery fellows. She served as the first chair of the ASTS National Transplant Surgery Fellowship Curriculum Committee and oversaw the establishment of the platform that hosts over 140 curriculum learning modules. Dr. Pomfret has served as the senior advisor to the ASTS Curriculum Committee for 4 years as it has continued to evolve since its initial launch in 2007. In addition, she is the Fellowship Training Program Director at Lahey Hospital and Medical Center for surgical transplant fellows, mentoring 14 fellows since 1999 and acting as an instructor for surgery residents and medical students at both Tufts Medical School and Lahey Hospital. She served on various organizational and governmental boards including the ASTS Board of Directors as a Councilor-at-Large from 2009 through 2012, and the OPTN/UNOS Board of Directors from 2011 – 2014. In addition to serving as President of ILTS, she currently serves as a Board Member on the UNOS Corporate Affairs Committee and was the former Chair of the OPTN/UNOS Liver and Intestinal Transplantation Committee. Dr. Pomfret is an active researcher with a record of peer-reviewed publications and has lectured worldwide on current issues in the field.

Mohamed Rela

AFFILIATION

Institute of Liver Disease and Transplantation, Global Hospitals Group, India

BRIEF CV

Prof. Rela was appointed as consultant surgeon in the Liver Unit at Kings College Hospital in 1994 and subsequently as Professor of Liver Surgery in 2008. He was involved in the development of Kings College Hospital into one of Europe's foremost centres for adult and pediatric liver transplantation.

In 2009, He returned to India to head the Liver transplantation services at Global Hospitals group. In the last 6 years, Global hospitals has developed into South India's busiest liver transplant centre performing over 250 transplants per year, over 200 of these being LDLT. The program specializes in pediatric liver transplantation and also runs a busy liver resection service.

RESEARCH INTERESTS

Mechanics of liver regeneration

Radical resection for hilarcholangiocarcinoma

Regeneration after Auxiliary partial orthotropic liver transplantation

Gi-Won Song

AFFILIATION

Department of Surgery, Asan Medical Center, Ulsan University, Korea

BRIEF CV

Prof. Song graduated from Pusan National University College of Medicine, Pusan, Korea. After finishing internship Residence and clinical fellowship in Asan Medical Center, he is a clinical associate professor in Asan Medical Center.

RESEARCH INTERESTS

Liver transplantation, HCC

Sumihito Tamura

AFFILIATION

Department of Surgery, The University of Tokyo Hospital, Japan

BRIEF CV

Dr. TAMURA graduated from Osaka University in 1992. Following surgical training including abdominal transplantation surgery fellowship under prof. Tzakis at Jackson Memorial Hospital, Miami, FL USA, he became Assistant Professor under Prof. Makuuchi at The University of Tokyo Hospital in 2004. Currently he is appointed Associate Professor and is also the Director of International Medical Center and Tissue Bank of the institution.

RESEARCH INTERESTS

Liver Disease,
Liver Transplantation
Organ Transplantation
Donor Safety in Living Liver Donor
Tissue Transplantation
Tissue Banking
Cryopreservation of homograft
Medical Education
Surgical Training
Medical Care for Foreign Patients in Japan
Multicultural Resource for Health Care

Chih-Chi Wang

AFFILIATION

Department of General Surgery, Chang Gung Memorial Hospital, Taiwan

BRIEF CV

Education:

China Medical College (1978~1985)

Employment Record :

1. Attending Staff, Division of Trauma Surgery, Lin-Kou Chang Gung Memorial Hospital (CGMH) (1992~1993) Division of General Surgery, Lin-Kou CGMH (1993~1994)
2. Research Fellow, Intensive Care Unit, Department of Anesthesiology, Harbor UCLA (March 1994~Oct. 1994)
3. Research Fellow, Liver Support Unit, Department of Surgery, Cedars-Sinai Medical Center, UCLA School of Medicine, Los Angeles, California (Oct. 1994~Apr. 1996)
4. Director, Division of General Surgery, Kaohsiung CGMH (July 2007~Dec. 2014)
5. Professor, Kaohsiung CGMH (July 2014~now)
6. Vice-superintendent, Chang Gung Memorial Hospital, Chiayi

RESEARCH INTERESTS

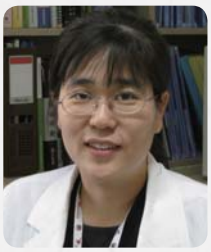
Liver resection

Hepatocellular carcinoma

Liver transplantation

Liver support system

Liver failure



Nam-Joon Yi

AFFILIATION

Department of Surgery, Seoul National University Hospital, Korea

BRIEF CV

Prof. Yi graduated from Ewha Womans University on 1996.

She is mainly working on liver transplantation.

She has a special expertise in living donor liver transplantation and pediatric liver transplantation.

Her work focuses on

Clinical studies of antiviral therapy for the recipients with hepatitis B virus associated liver disease,

Surgical technique for maximum use of a marginal graft and pediatric transplantation

Micro-chimerism and tolerance in the field of pediatric living donor transplantation

Developmental problem in post-transplant children

Biologic behavior of HCC and metastatic tumor

RESEARCH INTERESTS

1. Regeneration of the small-for-size graft
2. Changes of bile salt transporter on canalicular membrane of hepatocyte after transplantation
3. Micro-chimerism of the graft in the pediatric liver transplantation
4. Biologic behavior of liver cancer

SPONSORS & EXHIBITION

SPONSORS

PLATINUM PLUS

astellas
Leading Light for Life

GOLD PLUS

GREEN CROSS

GOLD

Chong Kun Dang Pharm. Seoul,Korea

NOVARTIS

SILVER

DAEWOONG

GILEAD
Advancing Therapeutics. Improving Lives.

Hanmi Pharm. Co., Ltd.

ETHICON
PART OF THE Johnson & Johnson FAMILY OF COMPANIES

Mitsubishi Tanabe Pharma

OLYMPUS

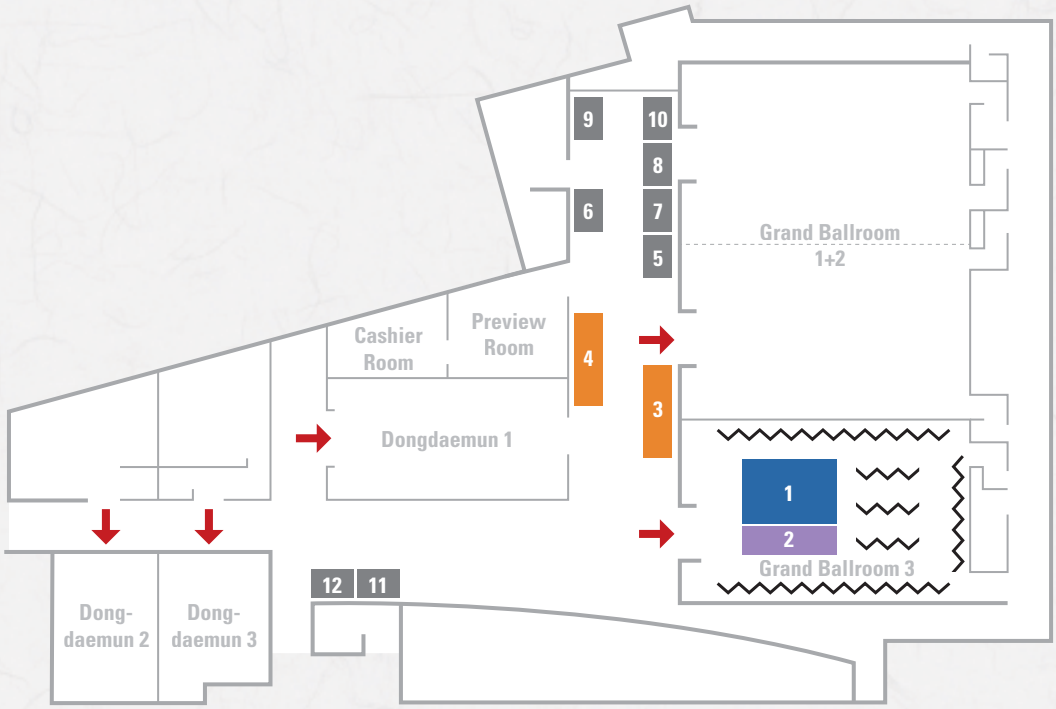
Roche

SK plasma

EXHIBITION INFORMATION

DATE	November 7 (Sat), 2015
OPENING HOURS	07:00-18:00
PLACE	Grand Ballroom 3 & Foyer, Lower Lobby Floor, JW Marriott Dongdaemun Square Seoul

EXHIBITION HALL LAYOUT



1	Astellas Pharma Korea, Inc.	2	GREEN CROSS CORP.
3	Chong Kun Dang Pharm	4	Novartis Korea
5	Roche	6	DAEWOONG PHARMACEUTICAL
7	SK Plasma	8	Hanmi Pharm.co.,Ltd
9	Mitsubishi Tanabe Pharma	10	OLYMPUS KOREA CO., LTD.
11	JOHNSON & JOHNSON MEDICAL COMPANIES	12	Gilead Sciences Korea Ltd.

EXHIBITION DIRECTORY

BOOTH 1 Astellas Pharma Korea, Inc

PRESIDENT	Hai Do Jeong		
FAX	+82-3448-0511	TEL	+82-3448-0504
WEBSITE	http://www.astellas.com/kr/	E-MAIL	
ADDRESS	3F, Geumha bldg., 401, Hakdong-ro, Gangnam-gu		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	135-766		

Astellas Pharma Korea, Inc. is the Korean subsidiary of a leading global pharmaceutical company with outstanding R&D capabilities and a worldwide network. It was founded on April 1st, 2005, through a merger between Fujisawa Pharmaceutical Co., Ltd. and Yamanouchi Pharmaceutical Co., Ltd., using 100% Japanese funding and dedicated to the goal of continued increase in company value. Astellas has contributed to increasing the quality of life of customers by developing drugs to treat adult diseases and disorders such as urination disturbances common in men, frequent urination commonly in women, overactive bladder syndrome that causes frequent bathroom trips, as well as painful atopic dermatitis. The company also developed Prograf and Advagraf, and immunosuppression agent, which has improved the survival rate of organ transplant recipients. Astellas Pharma Korea has been growing as a firm, taking pride in its contributions to customer quality of life, and provision of premium medicines in Korea, including Prograf, Advagraf, Harnal, Vesicare and Protopic Ointment. It also a promising company in the mid-to-long term with many superb products awaiting further development, clinical testing, and launch. Astellas Pharma Korea does not aim to merely expand sales volume, but will continuously increase company value with the goal of maximizing added value for customers and those seeking better health, by establishing its Global Category Leader business model.

BOOTH 2 GREEN CROSS CORP.

PRESIDENT	Eun-chul Huh		
FAX	+82-31-260-9412	TEL	+82-31-260-1977
WEBSITE	www..greencross.com	E-MAIL	woojinya@greencross.com
ADDRESS	107, Ihyeon-ro 30beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Korea		
CITY STATE	Yongin-si, Gyeonggi-do	COUNTRY	Korea
ZIP-CODE	16924		

Having spearheaded the biotechnology industry in Korea for the last half century,
Green Cross is now evolving into 'a global leader in healthcare industry' for a happy future for everyone.
For this, Green Gross promises to you it will put into practice its values : care, compassion, fairness, integrity and respect for all humanity. These are the values embodied by green cross on the basis of the spirit of creativity and challenge.
Our goal is to help people be free from the physical pain caused by diseases, so that they can lead stable and happy lives. Green Cross aims to become a leading healthcare service provider in fields such as medicines, medical equipment and healthcare services, and to help maintain and improve people's physical and mental health through disease prevention, diagnosis and treatment.

BOOTH 3 Chong Kun Dang Pharm

PRESIDENT	Young Joo Kim		
FAX	02-6200-3112	TEL	02-6200-3138
WEBSITE	www.ckdpharm.com	E-MAIL	kyjk4196@ckdpharm.com
ADDRESS	Chong Kun Dang bldg, Chungjeongno 3-ga, Seodaemun-gu, Seoul, Korea		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	03742		

Chong Kun Dang Pharmaceutical Corporation (CKD) has been supplying the best quality medicine to the people in need since its inception in May 1941.
In 1968, CKD obtained USFDA approval for Chloramphenicol API which was the first commemorative USFDA approval for raw materials in Korean pharmaceutical industry. Beyond the Korean market, CKD has exported its finished products to overseas markets.
CKD has a variety of its own products and pipeline: specialty products such as Cyclosporine (Cipol-N®) and Tacrolimus (TacroBell®), new chemical entities - Camtobell® injection, anti-cancer drug and Duvie®, anti-diabetic drug, and biological products – HPV vaccine, Darbepoetin-α and G-CSF biosimilars.
Recently, CKD-732, anti-obesity drug being licensed out to Zafgen (USA), was reported its successful completion of the phase IIa study.

BOOTH 4 Novartis Korea

NOVARTIS

PRESIDENT	Moon Hak Sun		
FAX	+82-785-1939	TEL	+82-768-9201
WEBSITE	www.novartis.co.kr	E-MAIL	Narae.kim@novartis.com
ADDRESS	18F, Yonsei Severance Bldg, 10, Tongil-ro, Joong-gu, Seoul		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	100-753		

Novartis AG, headquartered in Basel, Switzerland, is a leading global innovation-driven pharmaceutical company which is committed to discover and develop innovative drugs to cure diseases, to ease suffering and to enhance the quality of life through its more than 140 years history. Today, Novartis is one of the fastest growing global pharmaceutical companies, ranking the 2nd largest in the world. Novartis Group companies employ about 100,000 people and operate in over 140 countries. Novartis Korea is an affiliate of Novartis AG. Its major products include Neoral(Transplantation, Psoriasis), Certican/Myfortic/Simulect(Transplantation), Diovan/Exforge (hypertension), Glivec/Tasigna (leukemia), Exelon (dementia), Galvus (diabetes), Stalevo (Parkinson's disease), Femara (breast cancer), Lucentis (AMD), Sandimmun Neoral/Certican (immunosuppressant), Aclasta (osteoporosis), Exjade (iron overload). Novartis Korea was created in 1997 through merger of Sandoz Korea established in 1984 and Ciba-Geigy Korea, and has made every effort to improve the nation's quality of life, taking over Novartis' 'caring and curing', corporate mission and philosophy. Novartis Korea is committed to do its best to contribute to Korean society and Korean people's health and is aspired to become the most respected and successful pharmaceutical company in Korea. We also support the rapid development of the Korean healthcare industry. We are making innovative drugs available to Korea and provide recent scientific information through our leading edge clinical programs and our medical expertise.

BOOTH 5 Roche

PRESIDENT	Mike Crichton		
FAX	+82-2-561-7288	TEL	+82-2-3451-3782
WEBSITE	www.roche.co.kr	E-MAIL	taeseok.eom@roche.com
ADDRESS	17th GT Tower(East), 411, Seocho-daero, Seocho-gu, Seoul		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	137-856		

Roche has brought many highly effective drugs onto the market and is a world leader in innovative cancer drugs. Other areas include viral infections, metabolic, central nervous system disorders and inflammantory disease.

BOOTH 6 DAEWOONG PHARMACEUTICAL

PRESIDENT	LEE JONGWOOK		
FAX	+82-2-550-8099	TEL	82-2-550-8344
WEBSITE	WWW.DAEWOONG.COM	E-MAIL	BANG7914@DAEWOONG.CO.KR
ADDRESS	12, BONGEUNSA-RO 114-GIL, GANGNAM-GU, SEOUL		
CITY STATE	SEOUL	COUNTRY	KOREA OF REPUBLIC
ZIP-CODE	135-715		

Established in 1945, Daewoong Pharmaceutical Co., Ltd. has the largest prescription drug sales in Korea and envisions itself to become a top 50 global healthcare company by 2020.

In addition to its product portfolio, which includes 15 blockbuster products, Daewoong has built strong core competency for new drug development and has cultivated a cooperative culture for collaboration with global partners.

In the future, Daewoong will expand its global business with its foreign branches and global partners and become a global healthcare group which contributes to improving the quality of life for people worldwide.

BOOTH 7 SK Plasma

PRESIDENT	Jeongtae Kim		
FAX	+82-2-2008-7899	TEL	+82-2-2008-2567
WEBSITE	http://www.skplasma.com	E-MAIL	Byung-nam.chung@sk.com
ADDRESS	310 pangyo-ro, Bundang-gu, Seongnam-si		
CITY STATE	Gyeonggi-do	COUNTRY	Korea
ZIP-CODE	13494		

SK Chemicals have been transferred to a newly established subsidiary, SK Plasma. SK Plasma was established in order to focus solely on the plasma business. We expect that this change will enable us to expand our business worldwide.

BOOTH 8 Hanmi Pharm.co.,Ltd.

PRESIDENT	Mr. Gwan sun Lee		
FAX	02-410-9159	TEL	02-410-9114
WEBSITE	www.hanmi.co.kr	E-MAIL	
ADDRESS	45 Bangi-dong, Songpa-gu		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	138-724		

Hanmi Pharm established in 1973 has a motto 'to develop better drugs for precious lives' and to advance to the global market as a representative of the Korean pharmaceutical industry by focusing on R&D.

Hanmi Pharm has achieved the first and greatest export performance in 1990's based on 'innovation' and 'creativity', and became a pioneer of developing IMD which was recognized domestically and internationally in the 2000s.

Hanmi is also expected to become the first Korean company to develop a new global drug as clinical trials are conducted in the US and, Europe to develop diabetes and anti-cancer drugs.

Along with this, Hanmi has received GMP certifications from food and drugs authorities of developed countries and also strives to promote public health by exporting finished products to global pharmaceutical companies based upon differentiated quality management.

In order for our nation to become a leader in the pharmaceutical industry, Hanmi strives to lead continuous improvement through ongoing research and development and innovative solutions for healthcare. Hanmi will make every endeavor to become a pioneer in the field and elevate South Korea to "the Switzerland of Asia" in the pharmaceutical industry.

BOOTH 9 Mitsubishi Tanabe Pharma

Mitsubishi Tanabe Pharma

PRESIDENT	Matsuoka Kazuharu		
FAX	+82-2-579-125	TEL	+82-2-579-0121
WEBSITE	www.mt-pharma-korea.com	E-MAIL	achasan@mt-pharma-korea.com
ADDRESS	21F MMAA Bldg, 2806, Nambusunhwan-ro, Gangnam-gu, Seoul, Korea		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	KS013		

Mitsubishi Tanabe Pharma's philosophy states that "We contribute to the healthier lives of people around the world through the creation of pharmaceuticals." In accordance with this philosophy, as we implement our business activities we strive to realize our vision, which expresses that "We strive to to be a global research-driven pharmaceutical company that is trusted by communities."

BOOTH 10 OLYMPUS KOREA CO., LTD.

OLYMPUS

PRESIDENT	OKADA NAOKI		
FAX	02-6255-3457	TEL	02-6255-3336
WEBSITE	www.olympus.co.kr	E-MAIL	sookjung.lee@olympus-ap.com
ADDRESS	9F, Olympus Tower A, 446, Bongeunsa-ro, Gangnam-gu, Seoul, 06153 Korea		
CITY STATE	Seoul	COUNTRY	Republic of Korea
ZIP-CODE	06153		

Total Solution Provider for Surgery

SEE MORE TREAT BETTER

The **OLYMPUS HD 3D Imaging Solution** provides improved speed, accuracy and precision for surgical tasks while helping to shorten the learning curve, based on testing conducted using a simulated surgical model.

The **THUNDERBEAT** is the WORLD's ONLY integration of Ultrasonic and Advanced BiPolar energies delivered through a single multi-functional instrument. The patented jaw design provides precise, controlled dissection and always available Bipolar hemostasis without sacrificing grasping ability.

BOOTH 11 JOHNSON & JOHNSON MEDICAL COMPANIES

ETHICON
PART OF THE Johnson & Johnson FAMILY OF COMPANIES

PRESIDENT	Swami Raote		
FAX	02)2094-3907	TEL	02)2094-3664
WEBSITE	http://www.jnjmed.co.kr/	E-MAIL	Jhyewon@its.jnj.com
ADDRESS	24F, Hangangdaero 92, Yong-San gu		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE			

From creating the first sutures, to revolutionizing surgery with MIS, Ethicon has made significant contributions to surgery for more than 80 years.
Our continuing dedication to Shape the Future of Surgery is built on our commitment to solve the world's most pressing health care issues, and save more lives.

BOOTH 12 Gilead Sciences Korea Ltd.

GILEAD
Advancing Therapeutics. Improving Lives.

PRESIDENT	Paul Lee		
FAX	02-6030-3399	TEL	02-6030-3338
WEBSITE	http://www.gilead.com	E-MAIL	So-yeon.kwon@gilead.com
ADDRESS	26, Euljiro 5 gil, Jung-gu		
CITY STATE	Seoul	COUNTRY	Korea
ZIP-CODE	04539		

Advancing Therapeutics,Improving Lives

Gilead Sciences, Inc. is a research-based biopharmaceutical company that discovers, develops and commercializes innovative medicines in areas of unmet medical need. We strive to transform and simplify care for people with life-threatening illnesses around the world. Gilead's portfolio of products and pipeline of investigational drugs includes treatments for HIV/AIDS, liver diseases, cancer, inflammatory and respiratory diseases, and cardiovascular conditions.
Our portfolio of marketed products includes a number of category firsts, including complete treatment regimens for HIV infection available in a once-daily single pill and the first oral antiretroviral pill available to reduce the risk of acquiring HIV infection in certain high-risk adults.

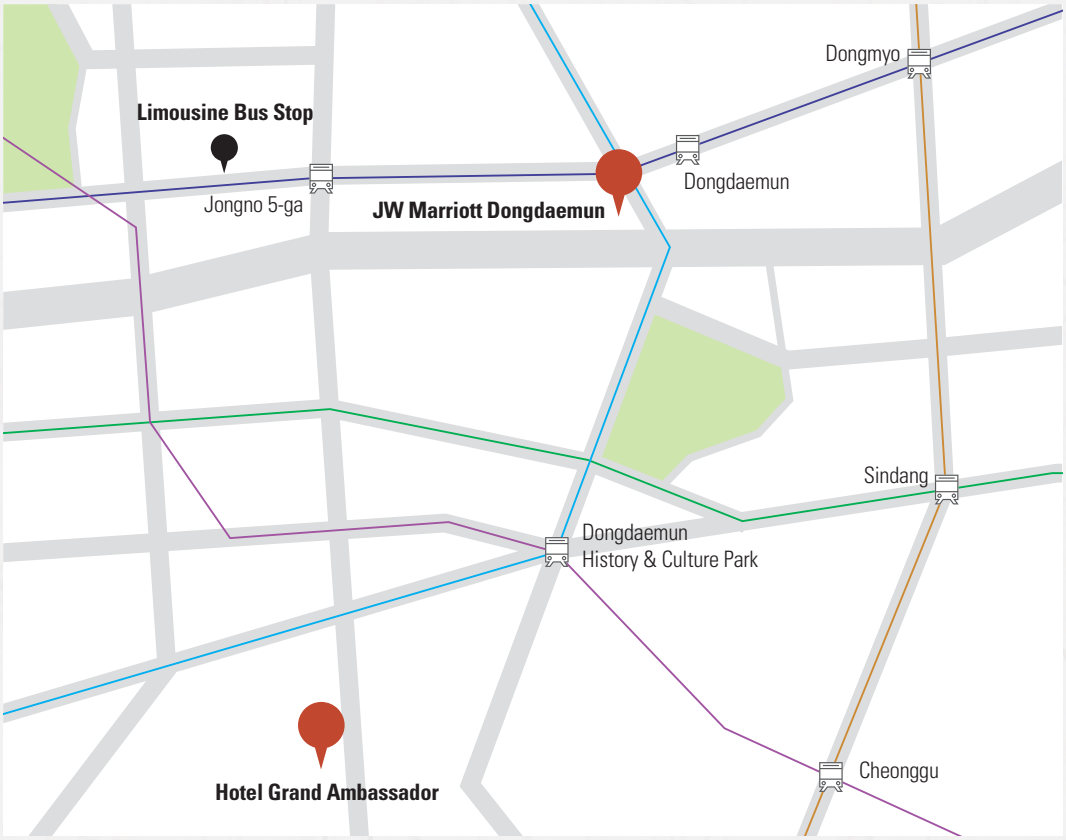
Strength Through Partnership

Collaborations of all kinds – with partners in science, academia, business and local communities – are central to our work. Partnerships enhance our ability to develop innovative medicines and deliver them to people as efficiently as possible.

Growing Worldwide Reach

Gilead was founded in 1987 in Foster City, California. Since then, we have grown to become one of the world's largest biopharmaceutical companies, with 7,500 employees across six continents.

HOTEL INFORMATION



Venue Hotel: JW Marriott Dongdaemun Square Seoul

No.	Hotel	Address	Distance from Venue
1	JW Marriott Dongdaemun Square Seoul	279, Cheonggyecheon-ro, Jongno-gu Seoul 110-126 Korea	Main Venue
2	Grand Ambassador Seoul	287 DongHoRo Joong-Gu Seoul Korea	2km / 10min by Car

*Check-in time is 15:00 and check-out time is 12:00.

GENERAL INFORMATION

Emergency

Dial 119 for the fire department and medical assistance and 112 for the police.

Climate & Clothing

The weather in Seoul in November is usually changeable with daily temperatures ranging from 2°C to 14°C. It is recommended that you take an outer garment with you when you go outside.

Currency

The unit of the Korean currency is the Won (₩). Coin denominations are ₩10, ₩50, ₩100, and ₩500. Banknotes are ₩1,000, ₩5,000, ₩10,000, and ₩50,000. The exchange rate is approximately US $1 to KRW ₩1,130 as of November 2015.

Tipping

Tipping is not customary in Korea. Sometimes, expensive restaurants and luxury hotels may add a service charge of 10%. Thus, you do not have to prepare for extra change since the service charge will be included in the bill.

Electricity

In Korea, 220 volt outlets are most common. However, please check the power supply before use, because some hotels provide 110 volt outlets for the convenience of their guests.

Telephone Calls

For international calls, first dial the international dialing code (001, 002 or 008), then the country code, followed by the area code, and then the phone number.

NOTE

The 2nd International Congress of

Living Donor Liver Transplantation Study Group

(ILDLT Study Group 2015)

대한간이식연구회

The Korean Liver Transplantation Society

Joint with the Korean Liver Transplantation Society

ABSTRACTS

The 2nd International Congress of

Living Donor Liver Transplantation Study Group

(ILDLT Study Group 2015)

대한간이식연구회

The Korean Liver Transplantation Society

Joint with the Korean Liver Transplantation Society

INVITED LECTURES

MEET THE EXPERT AT THE EARLY MORNING

Assessment of Donor Bile Duct Anatomy and Division: How do I do? 07:30-08:30

Assessment of Donor Bile Duct Anatomy and Division: How do I do?

Toshimi Kaido

Department of Hepato-Biliary-Pancreatic and Transplant Surgery
Kyoto University, Japan

An appreciation of the potential anatomical variations of the vascular and biliary systems is essential for donor safety in the context of live donor hepatectomy. We previously reported that variant biliary anatomy was present in a substantial proportion of donors with trifurcated portal veins (1, 2). Our current preoperative assessment of donor bile duct anatomy consists of routine performance of MRCP and, especially in cases of posterior segment graft, DIC-CT followed by dynamic CT to make 3D simulation image. In a living donor operation, we divide hepatic duct after confirmation of expected cutting line by intraoperative cholangiography.

In this lecture, we present some rare cases of living donors with biliary anomaly.

Case 1; a case of independent bifurcation of B4 and B2/3 from the common hepatic duct with the posterior branch bifurcated from B2/3 (3).

Case 2, 3; two cases of an independent bifurcation of B2 from the anterior or posterior bile duct (4).

Case 4; a case of posterior segment graft with right-sided round ligament.

References

1. Nakamura T, Tanaka K, Kiuchi T, et al. Anatomical variations and surgical strategies in right lobe living donor liver transplantation: lessons from 120 cases. Transplantation 73:1896-1903, 2002.
2. Kasahara M, Egawa H, Tanaka K, et al. Variations in biliary anatomy associated with trifurcated portal vein in right-lobe living donor liver transplantation. Transplantation 79:626-627, 2005.
3. Iida T, Kaido T, Mori A, et al. The rare insertion of B4 with trifurcated portal vein in live donor. Transplantation 89:1163-1164, 2010.
4. Iida T, Kaido T, Yoshizawa A, et al. A rare variation of the biliary tree of relevance to live liver donation. Am J Transplant 11:869-970, 2011.

MEET THE EXPERT AT THE EARLY MORNING

Assessment of Donor Bile Duct Anatomy and Division: How do I do? 07:30-08:30

Assessment of Donor Bile Duct Anatomy and Division: How do I do?

Gi-Won Song

Department of Surgery
Asan Medical Center, University of Ulsan College of Medicine, Korea

MEET THE EXPERT AT THE EARLY MORNING

Donor Evaluation and Selection Protocol 07:30-08:30

Donor evaluation protocol in LDLT at the University of Tokyo Hospital

Sumihito Tamura

Department of Surgery
The University of Tokyo Hospital, Japan

Donor evaluation and safe donor surgery is the most significant factor for a successful living donor liver transplant program.

Currently, two schools of thoughts are recognized in living donor hepatectomy. One is to obtain a graft as large as possible to secure the success of recipient surgery. Right liver graft is likely to be the choice in this scenario. The other is to obtain a graft as small as possible, leaving a comfortable size remnant on the donor side. The latter is commonly accepted in Asia, where living donor liver program has evolved in the hands of experienced hepato-biliary surgeons. Although the ultimate choice depends on the discretion of the surgical team, the team must recognize the surgically possible options and the inherent risk of selection.

A recent world-wide survey presented with a living donor mortality of 0.2% (23 out of 11553), morbidity of approximately 24%. Japanese nation-wide experience has been reported with donor mortality of 0.03% and morbidity of 7.5%. The procedure has evolved much to today's high standards. To continue with the high standards, not only depth of knowledge and surgical excellence but also procedural compliance and integrity within the multidisciplinary donor team must be maintained. This includes a questioning attitude, and formality in communications among the team during the evaluation process with the courage to discontinue under unfavorable circumstances.

At the University of Tokyo Hospital, We have based our selection criteria on an algorithm based protocol for the smallest possible graft types in each case. In the presentation, our experience and outcomes will be discussed, together with literature review.

MEET THE EXPERT AT THE EARLY MORNING

Donor Evaluation and Selection Protocol 07:30-08:30

Donor Evaluation and Selection Protocol

Nam-Joon Yi

Department of Surgery
Seoul National University Hospital, Seoul National University College of Medicine, Korea

MEET THE EXPERT AT THE EARLY MORNING

Perioperative Care of LDLT Recipient: What is Different from DDLT? 07:30-08:30

Perioperative Management of Liver Transplantation, Living Related Donor and Deceased Donor

Chih-Chi Wang

Department of General Surgery
Chang Gung Memorial Hospital, Taiwan

Purpose:
The benefits and drawbacks of living related liver transplantation (LDLT) compared to deceased donor liver transplantation (DDLT) had been debated in literatures. To elucidate the effect of perioperative management on clinical outcome, we designed this retrospectively observational study. The aim of this study is to investigate intra-operative management, post-operative complications and survival outcomes in a high volume liver transplant program in southern Taiwan.

Materials and Methods:
During Jan to Dec 2012, medical records of 134 patients underwent liver transplantation in Kaohsiung Chang Gung memorial hospital were retrospectively reviewed. Excluding criteria were pediatric recipients and re-transplantations. Major complications including vascular and biliary events needed interventional management, delayed hyperbilirubinemia (>10 mg/dl at POD 14), persistent post-operative ascites (>1L at POD 14 or > 500 mL at POD 28), staged operation, and unplanned re-exploratory laparotomy were analyzed. Vascular and biliary complications were defined according to image studies (including Doppler ultrasound, CT or MRI) and clinical findings.

Results:
114 patients, including 110 LDLT and 4 DDLT, were enrolled in this study. Five patients (LDLT: 4 and DDLT: 1) died at the date of follow-up. One year survival rate of LDLT and DDLT are 95.5% and 75.0% respectively. Post-operative complication in LDLT group is 64 (58.1%), and 38 (34.5%) patients had experienced more than one major complication. There were 6 (5.5%) staged operations, 12 (10.9%) unplanned laparotomy including 3 re-transplantation and one hepatic artery revascularization. Complications of vascular, biliary, hyperbilirubinemia, and persistent ascites are 32 (29.1%), 17 (15.5%), 3 (2.7%) and 29 (26.4%). There were no major complications observed in DDLT group. There was no significantly statistical difference in all complication subgroups.

Conclusion:
High complication rate in LDLT is still an important issue today. Good survival outcome could be achieved by successful management of complications.

MEET THE EXPERT AT THE EARLY MORNING

Perioperative Care of LDLT Recipient: What is Different from DDLT? 07:30-08:30

Perioperative Care of LDLT: What is different from DDLT?

Kim Olthoff

Department of Surgery
Hospital of University of Pennsylvania, USA

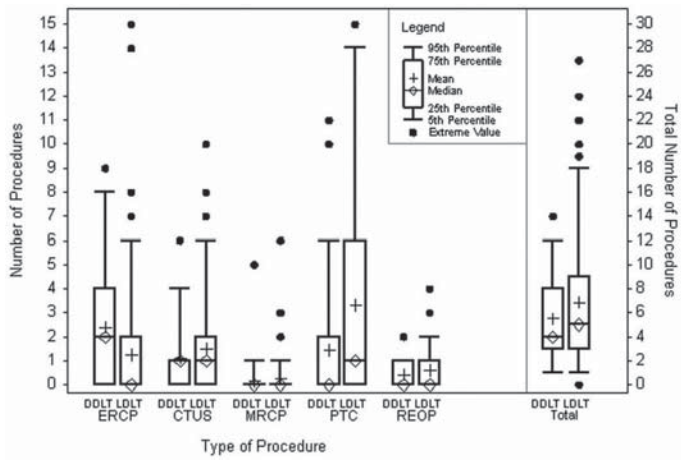
Living donor liver transplantation has emerged as an important source of organs when there is a critical scarcity of livers from deceased donors. A recent study from the Adult-to-Adult Living Donor Liver Transplantation Cohort Study (A2ALL) compared the long-term survival of living donor liver transplant (LDLT) at experienced transplant centers to outcomes of deceased donor liver transplant (DDLT) and found that LDLT can have equal, if not better, long-term outcomes (1). Patients usually have to wait longer and become sicker before organs become available from deceased donors, and thereby often have more co-morbidities associated with end-stage liver disease than those receiving LDLT. Another A2ALL study, just published, compared 471 DDLTs to 565 LDLTs over a 12 year period (2). Mean MELD for the DDLT recipients was 20 compared to 15 for LDLT. In addition, 26% of DDLT were hospitalized compared to only 7% of LDLT. Biliary complications and HAT were higher in LDLT, but bleeding, cardiac complications and pulmonary issues were more probably in the DDLT group. In addition, development of chronic kidney disease was much less likely in the LDLT group (HR 0.41). When adjusted for other risk factors, DDLT and LDLT had similar risk of Clavien grade 4 complications.

Samstein et al

Table 2: Probability of specific complications in recipients of living or deceased donor liver transplantation*δ

		In the first year			Overall		
		LDLT	DDLT	Log-rank p-value	LDLT	DDLT	Log-rank p-value
Significantly higher in LDLT over all follow-up	Bile leak/biloma	0.24	0.08	<0.0001	0.26	0.09	<0.0001
	Blood infection¥	0.20	0.13	0.0519	0.26	0.15	0.0091
	Biliary stricture	0.23	0.14	0.0006	0.32	0.21	0.0002
	Biliary tree infection	0.11	0.04	0.0076	0.14	0.06	0.0062
	Hepatic artery thrombosis	0.06	0.02	0.0061	0.06	0.04	0.0378
Significantly higher in DDLT over all follow-up	Pulmonary edema	0.09	0.17	<0.0001	0.10	0.36	<0.0001
	Ascites	0.14	0.20	0.0132	0.21	0.25	0.0151
	Cardiac complications	0.01	0.05	0.0004	0.02	0.06	0.0008
	Intra-abdominal bleeding	0.05	0.08	0.0264	0.05	0.08	0.0190

Zimmerman et al



Given these differences, the perioperative care of the LD can differ significantly from the DD. For example, in the LD, one must pay attention to vascular flow and patency and ultrasound surveillance, as well as therapy with anti-platelet agents or anticoagulation may be necessary. In the DD, the use of CRRT in the OR may be beneficial and necessary, and more diligent cardiology evaluation and follow-up may be indicated. The treatment of biliary complications differed between the 2 groups in that there were more PTCs done in the LDLTs, and more ERCPs in the DDs, but overall treatment requirements were similar (3). The development of small-for-size syndrome is much more likely in the LDLT, and the centers must be vigilant about ways to prevent, as well as aware of methods to treat if it develops (4).

1. Olthoff KM, Smith AR, Abecassis M et al. Defining Long-Term outcomes with living donor liver transplantation in the US. Ann Surg. 2015;262:465-75
2. Samstein B, Smith AR, Freise CE, Zimmerman MA, Baker T, Olthoff KM, Fisher RA, Merion RM. Complications and their resolution in recipients of deceased and living donor liver transplants: Findings from the A2ALL Cohort Study. Am J Transpl 2015 (epub ahead of print).
3. Zimmerman MA, Baker T, Goodrich NP, et al. Development, management, and resolution of biliary complications after living and deceased donor liver transplantation: A report from the A2ALL cohort study consortium. Liver Transpl 2013;3:259-67
4. Graham JA, Samstein B, Emond J. Early graft dysfunction in living donor liver transplantation and the small-for-size syndrome. Curr Transpl Rep 2014;1:43-52

[SYMPOSIUM 1] IMMUNOLOGY IN LIVER TRANSPLANTATION

09:00-09:20

De novo Autoimmune Hepa titis after LDLT

Hiroto Egawa

Department of Surgery
Tokyo Women's Medical University, Japan

The etiology of late graft dysfunction has been widely investigated and various features have been reported. Among them, unexplained late graft dysfunction associated with autoimmune features in liver transplant patients without previous autoimmune hepatitis (AIH) is called de novo AIH (DAIH). The incidence ranged from 1.2% to 8.3% in pediatric patients and from 0.4% to 3.1% in adult patients. On the other hand, idiopathic post-transplantation hepatitis (IPTH) is defined as interface hepatitis without a high titer of autoantibodies.

Kyoto group reported that risks for DAIH were age at transplantation, biliary atresia, and history of ACR. UCLA group reported rejection episodes and requirement of more immunosuppression but HLA mismatch or steroid weaning was not risks.

Patients with DAIH respond well to steroid treatment but are likely to suffer from adverse effects of steroid. As mechanisms, Laura et al reported that presence of DQ donor specific HLA antibody was associated with DAIH and late ACR. From this point of view, B cell desensitization might be effective as a treatment of DAIH, although this is still controversy.

[SYMPOSIUM 1] IMMUNOLOGY IN LIVER TRANSPLANTATION

09:20-09:40

Operational Immune Tolerance after Pediatric LDLT: What's the Next Steps?

Mureo Kasahara

Organ Transplantation Center
National Center for Child Health and Development, Japan

2nd LDLT Study Group
Seoul, Korea
Nov 7, 2015

Operational Immune Tolerance after Pediatric LDLT: What's the Next Steps?

Mureo Kasahara MD, PhD
National Children's Hospital, Tokyo, Japan

Topics

- Current immunosuppression in pediatric LTx
- Past IS withdrawal in LTx
- Future perspective of IS withdrawal in LTx

Dilemma of Immunosuppression (IS)

- What should we do for the case of adverse effect with IS, especially with renal insufficiency, active infection?
- What should we do for the patient who are apparently doing well long after transplantation?

Problems in Long-Term Follow-up

- Adverse effects of IS in long-term
- Chronic rejection and graft fibrosis
- Recurrence of original liver disease
  Hep C, AIH, PSC, FIC, etc

Operational Tolerance Induction may play a role in this scenario.

Liver is Tolerogenic Organ

- **Animal research model**

A combination in rat (PVG→DA) ; kidney is rejected, while the liver is accepted without rejection.

Sharland A et al. Transplantation 1998; 65: 1370

- **Clinical research model**

In liver transplantation, donor-specific hyporeactivity is developed, but not in kidney transplantation.

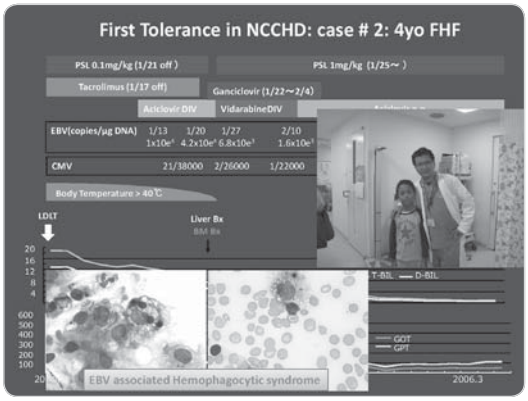
Van Twuyver et al. Transplantation 1996; 61: 1392

First Tolerance Report

" Of the 44 patients more than 10 years after liver transplantation, 6 (13.6%) patients had been doing well with good graft function, in spite of that they stopped immunosuppression by themselves."

Starzl TE et al. Cell migration and chimerism after whole-organ transplantation: the basis of graft acceptance. Hepatology 1993; 17: 1127

First Tolerance in NCCHD: case # 2: 4yo FHF



Definition of Tolerance

- Remaining off immunosuppression therapy for 1 year with normal graft function, normal histology.
- The definition is functional and based on clinical allograft status rather than on immunological assesment of donor-sepecific alloactivity.

Clinical Tolerance Induction

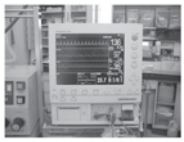
Year	Institution	n	Ped/Adult	Indication	Tx~Weaning (y)	Tolerance	ACR
1997	Pittsburgh, USA	95	31/64	>5y post Tx, ACR (-)	8.4	19%	26%
2002	Kyoto, JP	115	115/0	>2y, ACR (-)	>2	42.6%	17.3%
2003	Murcia, Spain	9	0/9	>2y	5.2	33%	22%
2004	Miami, USA	104	0/104	>3y, ACR (-)	4	19%	67%
2005	Kings, UK	18	1/17	>5y	7	11%	28%
2005	New Orleans, USA	18	0/18	>6m	>0.5	5.6%	61%
2006	Rome, Italy	34	0/34	>1y, HCV+	5.25	23.4%	76%
2007	London, Canada	26	0/26	>2y	>2y	7.6%	57.7%
2012	UCSF, USA	20	20/0	>4y, ACR(-)	>4y	60%	20%
2013	Navarra, Spain	24	0/24	>3y, ACR(-), HepB/ALD	1y	48%	37.5%
2013	Balcerona, Leuven, EU	98	0/98	>3y, ACR(-), AID(-)	>3y	41.8%	58.2%

Clinical Tolerance Induction

- Adults: 8~33%
- Pediatrics: 42.6~60%
- Monitoring of Tolerance are done with LFT, DSA, Protocol Bx, Reguratory T-cells, etc. But, Factors predictive of tolerance are not clearly understood.
- Operational tolerance occurs more frequently in Children than in Adults, and in parental LDLT.
- Increased time interval between Tx and IS withdrawal was the most important clinical factor associated with successful IS withdrawal.

Clinical Tolerance Induction: Monitoring/ Compass

- The identification of biomarker associated with a high likelihood successful IS withdrawal is critical in order to select patients, in whom the potential benefits of IS discontinuation outweigh the risk of rejection.



Monitoring

Compass

Operational (active) Tolerance Induction in Kidney Tx

Application of Bone marrow Tx prior to Kidney Tx

1. Boston : Total irradiation + Anti-CD2Ab+ Rituximab+ BMTx

Kawai T, et al. N Engl J Med. 2008
Nadazdin O, et al. Sci Transl Med 2012

2. Stanford : Total lymphoid irradiation+ ATG+ BMTx

Scandling JD, et al. N Engl J Med. 2008
Scandling JD, et al. Am J Transplant 2012

3. Northwestern: Total body irradiation+ Fludarabine+ High dose Cyclophosphamide+ BMTx (Donor Stem cells)

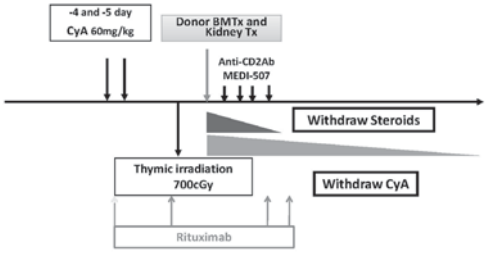
Leventhal J, et al. Transplantation. 2013

4. Hokkaido: Treg infusion + Cyclophosphaide

Yamashita K, et al. ASTS 2013; AB #552

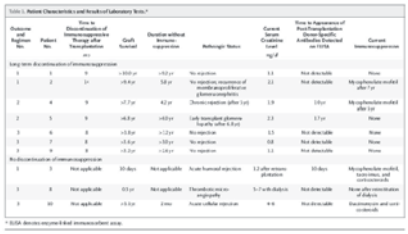
1. Boston, MGH Protocol

Kawai T, et al. NEJM 2008;368



1. Operational Tolerance Induction in Kidney Tx

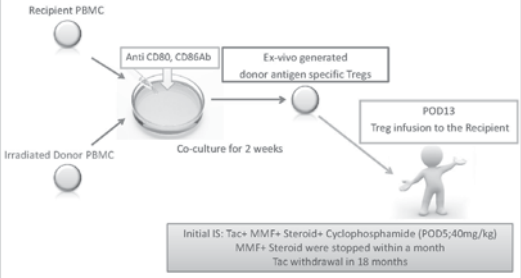
Kawai T, et al. NEJM 2008;368
Kawai T, et al. NEJM 2013;3355



Long-term stable tolerance can be induced in 5/10 patients.

4. Operational Tolerance Induction in Liver Tx

Yamashita K, et al. ASTS 2013; AB #552



Operational Tolerance Induction in Liver Tx

Yamashita K, et al. ASTS 2013; AB #552

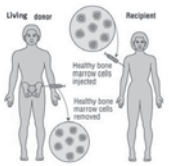
Case	Age/ Gender	Disease	Infused cells (x10⁶)	Time after LTx (days)	AST/ALT (IU/L)	IS status
1	20/M	LC (HCV)	0.61	721	26/18	Off (for 90 days)
2	63/M	LC (alcoholic)	2.54	654	36/66	Off (for 75 days)
3	56/M	LC (NASH)	0.79	626	18/13	Off (for 64 days)
4	59/M	LC (HBV)+HCC	2.45	521	36/9	TAC 3 mg, x1/wk
5	52/M	PBC	0.63	437	39/30	TAC 5 mg, qd
6	55/F	PSC	1.18	395	24/17	CYA 150 mg, bid
7	59/F	LC (NASH)+HCC	2.59	374	22/14	TAC 2 mg, x3/wk
8	56/M	LC (alcoholic)	0.70	297	18/12	CYA 100 mg, bid
9	58/F	PBC	1.10	234	21/14	TAC 2 mg, qd
10	55/M	LC (NASH)+HCC	1.20	129	29/26	TAC 3 mg, bid

(as of Nov. 30, 2012)

Cell therapy based on ex-vivo generated donor-antigen specific Tregs allowed early reduction (within 18mo) of IS in 9 cases and ultimate cessation in 7/10 cases after LDLTx (personal communication).

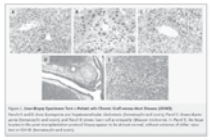
What's the Next Steps?

① Bone marrow transplantation



Living-Donor Liver Transplantation for Chronic Hepatic Graft-versus-Host Disease

Shimizu T, et al. NEJM 2006:354:14

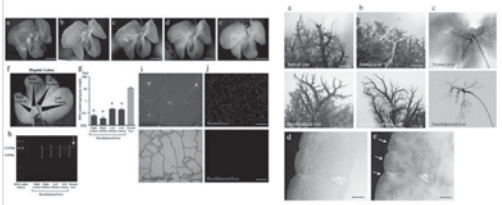


② Living donor liver transplantation
From the same donor

What's the Next Steps?

Human-Scale Whole-Organ Bioengineering for Liver Transplantation

Yagi H, et al. Cell Transplant 2013;22:231



Isolated hepatocytes engrafted and reorganized in the porcine decellularized livers using a human-sized organ culture system.

These results provide proof-of-principle for the generation of a human-sized, three-dimensional organ scaffold as a potential structure for human liver grafts reconstruction for transplantation to treat liver disease.

Conclusion

- Operational tolerance occurs more frequently in Children than in Adults, and in parental LDLT.
- Increased time interval between Tx and IS withdrawal was the most important clinical factor associated with successful IS withdrawal.
- Future study, induction of Treg/ combined with LDBMTx/ Organ scattford, should be neccessary to achieve ideal organ tolerance after transplantation.

[SYMPOSIUM 1] IMMUNOLOGY IN LIVER TRANSPLANTATION

09:40-10:00

Donor Reactive CD25+CD4+Foxp3+ Regulatory T cells- Bench to Bedside

Sang-Mo Kang

Department of Surgery
University of California, San Francisco, USA

CD4+ "suppressor" T cells were observed in transplantation tolerance models over 3 decades ago, and were found to be critical to the development and maintenance of tolerance. Moreover, these cells were shown to be able to confer tolerance in adoptive transfer models. In the mid 1990s, CD4+CD25+ T cells were shown to be vital to the prevention of autoimmunity and were termed "regulatory" T cells (Treg). However, the entire field was hampered by the lack of a specific marker for these cells. A decade later, Foxp3 was identified as a molecular marker of Treg and the field has rapidly progressed to the point where multiple clinical trial of Treg are underway or planned in both autoimmunity and transplantation.

In the context of transplantation, Foxp3+ Treg are critical to the development and maintenance of immunologic tolerance in animal models, and numerous human studies suggest a correlation between Treg and tolerance. Animal studies have also demonstrated that Treg may be administered therapeutically to prevent rejection. Translation of these findings to clinical transplantation will require an understanding of dosing/frequency, the need for concomitant immunosuppressants/immunomodulatory agents, and the need for donor specificity. We will discuss the various parameters in the context of pre-clinical animal studies and how they have influenced our approach to initial clinical trials.

We will then present the development of a GMP-compliant, FDA approved method for expanding donor reactive Treg up to 2,000 fold with high purity, activity, and specificity. Several clinical trials using these cells are underway at UCSF in renal as well as liver transplantation and we will outline the design and progress of these early trials. Finally, we will discuss why we believe that living donor liver transplantation presents the optimal setting for a tolerance trial using donor-reactive Treg.

[DEBATE SESSION]

Debate 1 : Graft Factors and HCC Recurrence after LDLT 10:00-10:10

Yes: There is Some Association.

See Ching Chan

Department of Surgery
The University of Hong Kong, Queen Mary Hospital, Hong Kong, China

[DEBATE SESSION]

Debate 1 : Graft Factors and HCC Recurrence after LDLT 10:10-10:20

No: There is No Association.

Shin Hwang

Department of Surgery
Asan Medical Center, Ulsan University, Korea

[DEBATE SESSION]

Debate 2 : Constant Wrangling over Graft Selection in Adult LDLT 10:40-10:50

Right Lobe

Chung-Mau Lo

Department of Surgery
The University of Hong Kong, Hong Kong, China

Right and left are relative directions and may change as a person moves. Over 90% of the populations are right-handed and the direction of right is a cognate of "right", meaning correct or good. In fact, the word "left" comes from the old English word "lyft", meaning weak. These literal meanings of right and left also apply in graft selection for adult living donor liver transplantation (LDLT). In normal individuals, the right liver constitutes about two-third of the total liver volume and the left liver one-third only. Since the minimum graft volume for successful LDLT is about 40% of recipient standard liver volume or 0.8% of body weight, the left liver is rarely large enough for successful LDLT unless the donor body size is larger than that of the recipient. Hence, right liver LDLT has been developed to overcome this size-matching barrier. With better understanding of the mechanism of small-for-size syndrome, occasional cases of successful ultra-small left liver LDLT has been reported and the minimum graft size requirement may be lowered to 35% of recipient standard liver volume or 0.7% of body weight. Nonetheless, since liver disease is far more prevalent in men than in women and our experience indicates that man-to-woman donation accounts for less than 15% of all adult LDLT, even right liver LDLT are frequently small-for-size especially in woman-to-man donation. Our study based on the volumetric data of living donors indicates that if the minimum graft size requirement for LDLT is lowered from 40% to 35% or even 30% of standard liver volume, the feasibility of LDLT using left liver may be increased from 5.8% to only 12.9% and 29% respectively. Individual transplant centers that are very aggressive in using left liver still have to select the right liver in over 70% of adult LDLT. In conclusion, we have to keep right as we turn left in adult LDLT. The right liver is still the right choice in the majority of adult LDLT.

[DEBATE SESSION]

Debate 2 : Constant Wrangling over Graft Selection in Adult LDLT 10:50-11:00

Left Lobe with Portal Flow Modulation

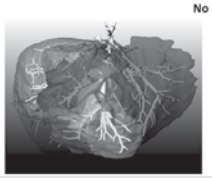
Elizabeth Anne Pomfret

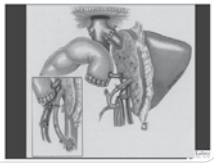
Department of Transplantation and Hepatobiliary Diseases
Lahey Clinic, USA

Inflow Modulation for Left Lobe Liver Grafts

Elizabeth A Pomfret, MD, PhD, FACS
Chair, Department of Transplantation and Hepatobiliary Diseases
Lahey Hospital and Medical Center
Professor of Surgery
Tufts Medical School

No Disclosures





Background

- "Small for size syndrome" (SFSS) is a term used to describe early allograft dysfunction (EAD) after LDLT
- Historically there has been interest in using larger right lobe grafts to avoid SFSS (initially better outcomes compared to LL)
- **Donor mortality 0.2-0.5% Right Lobe versus 0.1% Left Lobe**
- There is renewed interest in smaller left lobe liver grafts to **shift risk "back to the recipient"**
- **What is the Role for Inflow Modification to Help Reduce SFSS or EAD in smaller grafts?**
- **Is SFSS Really About Size?**

Commonly Used Definition: SFSS

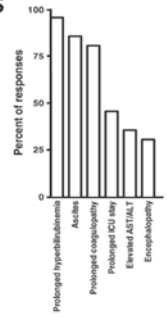
Responses of senior transplant surgeons (n = 20) to the question 'Which of the following must be present to diagnose SFSS?'

Table 1: Responses of senior transplant surgeons (n = 20) to the survey on SFSS*

	Yes	No
Do you consider SFSS a distinct disease entity?	20	0
Is portal hyperperfusion a part of SFSS?	18	2
Is outflow obstruction a part of SFSS?	7	13
Is arterial hypoperfusion a part of SFSS?	7	13
Would you accept a diagnosis of SFSS if the patient recovers spontaneously?	18	1
Can SFSS occur later than 1 week postoperatively?	7	10

*Some respondents did not answer every question.
SFSS = small-for-size syndrome.

Small-for-Size Syndrome After Partial Liver Transplantation: Definition, Mechanisms of Disease and Clinical Implications
Dahm, Felix, Panco and Clavien; American Journal of Transplantation
Volume 5, Issue 11, pages 2605-2610, 11 SEP 2005



Simple Definition of EAD or SFSS

Validation of a Current Definition of Early Allograft Dysfunction (EAD) in Liver Transplant Recipients and Analysis of Risk Factors Kim M. Olthoff, Laura Kulik, Benjamin Samstein, Mary Kaminski, Michael Abecassis, Jean Emond, Abraham Shaked, and Jason D. Christie
LIVER TRANSPLANTATION 16:943-949, 2010

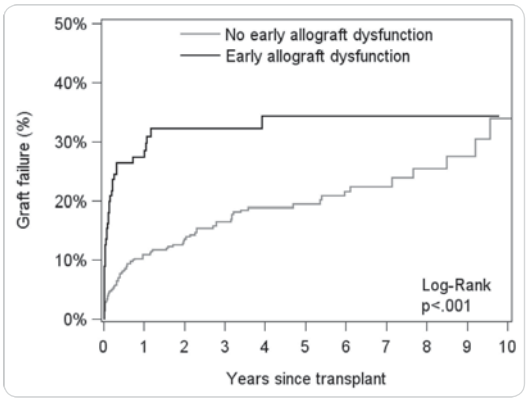
EAD defined as **one** of the following

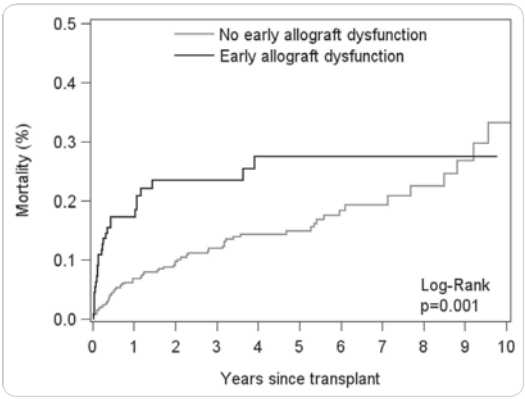
Bilirubin ≥10mg/dL on post operative day 7 or
International Normalized Ratio ≥1.6 on postoperative day 7

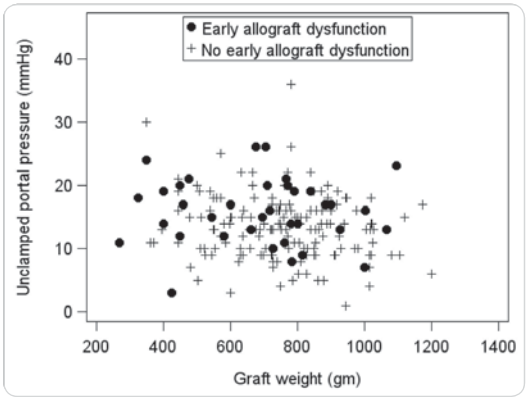
North American Adult to Adult Living Donor Liver Transplantation (A2ALL) Cohort Study

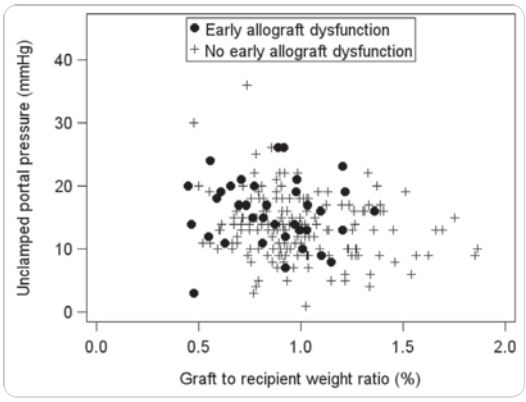
- Study Population: 2 phases completed
  - 631 Living Donor Liver Transplants (LDLT)
  - Monitored for Morbidity, Mortality, Outcome
  - EAD defined as Total Bilirubin >10 or INR> 1.6 on POD 7
  - 274 recipients had portal pressure and flow measured before and after LDLT
  - Inflow modification by surgeon discretion

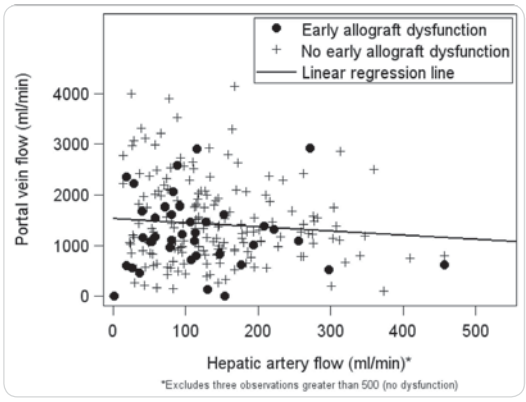
A2ALL

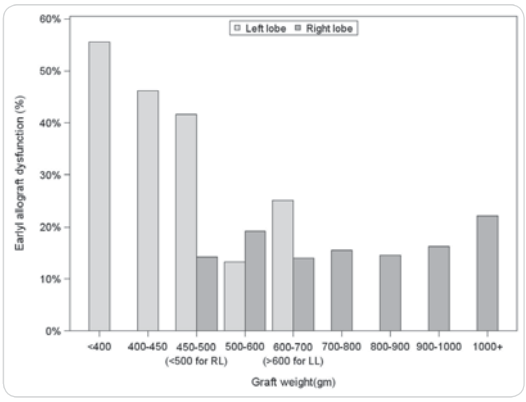


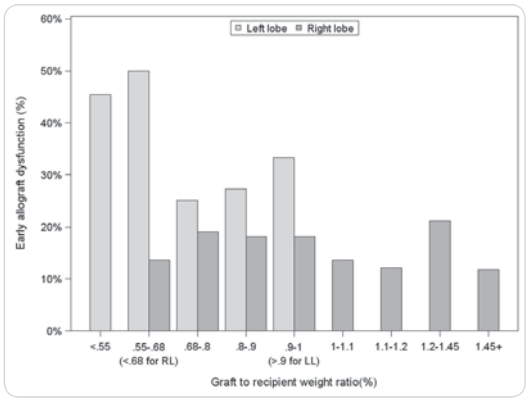


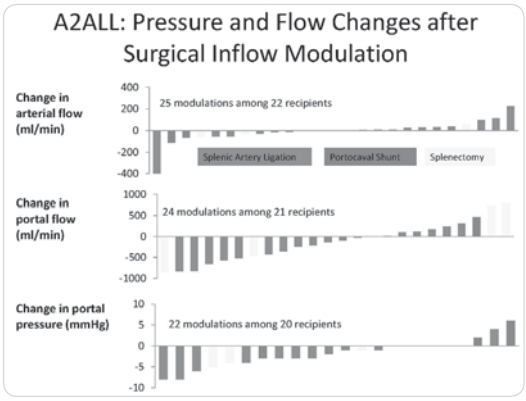


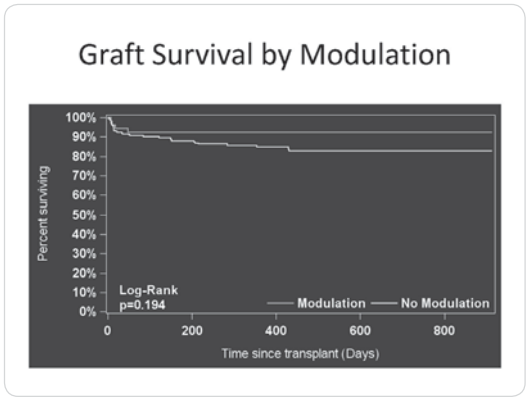


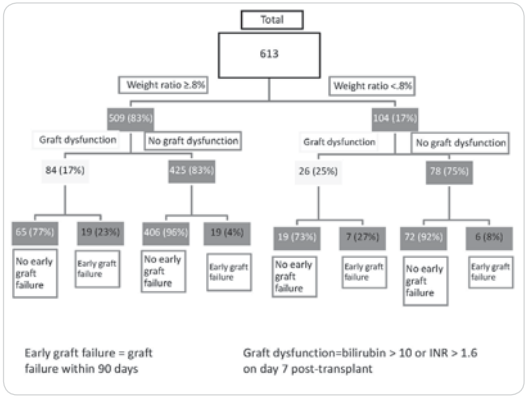












Right Lobe Grafts Do Work Well……
So Why Try to Make Left Lobe Grafts Work Better?

Right Lobe Grafts May Be More Dangerous for the Donor

1997

N.C. Donor Knew Risks, But Believed He'd Survive Danny Boone Was In Good Health When He Gave Part Of His Liver To His Half-brother. He Died Of Complications.

1999

2001

Boston Sunday Globe

Donor's death shatters family, stuns surgeons

2010

2010

If We are Going to Use Smaller Grafts What Are The Strategies for Preventing EAD?

- Use Smaller Recipient: Maximize GW/BW
- Avoid Severely Ill Recipient (lower MELD score)
- Gain Experience (Procurement, Recipient)
- **Lower Portal Pressure/Flow: Inflow Modulation**
  - **Medical Modulation**
  - **Surgical Modulation**

Inflow Modulation: Important Questions

- Who Needs Modulation? Who is at risk?
- When to Modulate? Preemptive or Salvage?
- How Best to Modulate? Which Techniques?
- Do All Respond Equally? Multiple Modulations?

Inflow "Medical" Modulation

- Octreotide
- Vasopressin
- Nitroglycerin
- Adenosine
- Nitric Oxide
- Endothelian A Receptor Antagonist
- Phosphodiesterase III inhibitors
- Others?

Surgical Inflow Modulation

- Splenic Artery Ligation
- Splenic Artery Embolization (salvage)
- Splenectomy
- Hemiportocaval Shunt
- Collateral Vein Ligation
- TIPS (salvage)

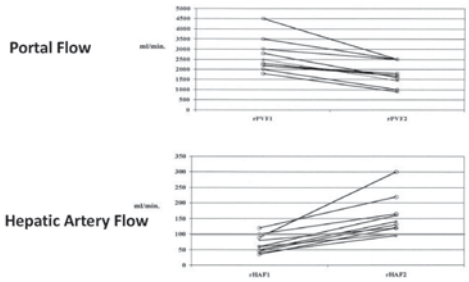
Effect of Graft Inflow Modification on Portal Venous and Hepatic Arterial Flow After LDLT

	Before GIM	After GIM	P
PVF 1 (mL/min)	2,600+/-832	1,700+/- 689	0.03
PVF 1/GW (mL/m/100 g)	360+/-143	240+/-64	0.02
HAF 1 (mL/min)	87+/-39	152 +/-64	0.003
HAF 1/GW (mL/m/100 g)	12+/-5.6	22.1+/-8	0.002

All splenic artery ligation, 2 combined with PV banding except 1 HPCS
SFSS developed in 27% without GIM, 0% with GIM
1 Year survival: 62% vs. 93% respectively

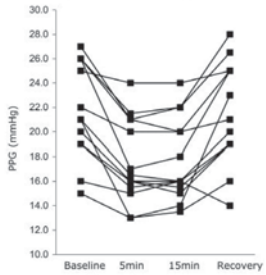
Roberto Troisi and Bernard de Hemptinne
Liver Transplantation, Vol 9, No 9, Suppl 1 (September), 2003: pp S36-S41

Relationships Before and Following Splenic Artery Ligation in PVF and HAF.



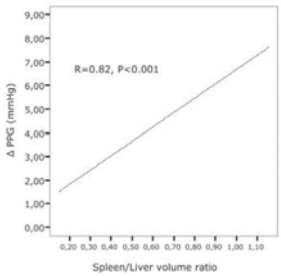
Troisi et al; Ann Surg Mar 2003; 237(3):429-436

Effects of temporary splenic artery occlusion on portal pressure gradient



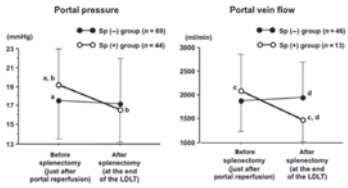
Angelo Luca, et al **Liver Transplantation** Volume 12, Issue 8, pages 1237-1243, 1 JUN 2006

Effects of Splenic Artery Occlusion on Portal Pressure Gradient Change: Strong Correlation with Liver/Spleen Volume Ratio



Angelo Luca, *et al* **Liver Transplantation** Volume 12, Issue 8, pages 1237-1243, 1 JUN 2006

Role of splenectomy in living donor liver transplantation in patients with small-for-size graft



Other Benefits Identified: Reduced inflammatory cells into liver graft, increase hepatic artery flow and reduce postop cytopenia

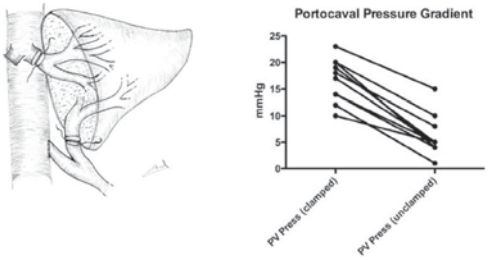
Yoshiuzumi, et al 2008; Transplant International Volume 21, Issue 9, pages 833-842,

Shifting Risk Back to the Recipient: Resurgence of the Left Lobe Graft Preemptive Hemi Portocaval Shunt (HPCS)

- 2 American Centers, Combined 21 Left Lobe Grafts with Preemptive Hemi Portocaval Shunt (HPCS)
- GW/BW 0.67 (range 0.5-1.0)
- Graft Weight 413 g (range = 350-670 g)
- Patient and graft survival at 1 year were 87% and 81%, respectively
- SFSS developed in only 1 patient

Botha et al, Liver Trans, May 2010;16(5):649-657

Effect of Preemptive HPCS on Portal Pressure Gradient

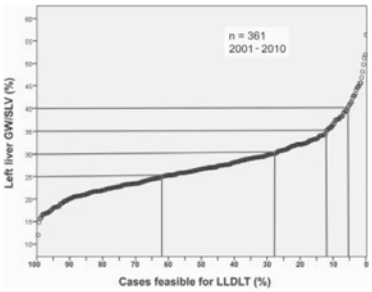


Botha et al, Liver Trans, May 2010;16(5):649-657

How Small Can We Go? How Much Liver Does The Recipient Really Need?

- % of Standard Liver Volume (25, 30, 35, 40%)?
- GW/BW (0.6, 0.7, 0.8)?
- Depends: Recipient Disease Severity, Donor Age, Portal Pressure, Portal Flow, Liver/Spleen Volume Ratio, etc.
- Goal: Develop a "EAD Risk Index" Incorporating Multiple Parameters to Help Decide

Increasing the Recipient benefit/Donor risk ratio by lowering the graft size requirement for living donor liver transplantation



See Ching Chan et al Liver Transplantation Volume 18, Issue 9, pages 1078-1082, 27 AUG 2012

Conclusions: Left Lobe Inflow Modulation

- Modulation is effective at lowering portal pressure and flow and is associated with a high graft survival rate in "patients at risk"
- We need to better define threshold limits for risk-related factors (getting closer)
- More Liberal Use of Left Lobe Grafts (with modulation) May Ultimately Be Safer for the Donor Without Compromising the Recipient

Thank You

[SYMPOSIUM 2] HOW TO ESTABLISH A NEW LDLT PROGRAM

11:40-11:47

New Liver Transplantation project in Mongolia

Sergelen Orgoi

Department of Surgery
Health Sciences University of Mongolia, Mongolia

Abstract. During the past 20 years liver transplantation has become the definitive treatment for most severe types of liver failure and hepatocellular carcinoma, in both children and adults. Mongolia is known for its high endemicity for hepatitis B virus (HBV), hepatitis C virus (HCV), and hepatitis delta virus (HDV) infections among apparently healthy individuals. However, there are little or no data on the prevalence and genotype distribution of HBV, HCV, and HDV among patients with chronic liver disease in Mongolia.

Liver transplantation project had initiated from 2007 in Mongolia with ASAN Medical Center, and we have 3 steps until today's level. ASAN medical center was donated all equipments, which needs for LT and had given a chance to learn or practice in its own center.

During these years we have 20 cases, from that 2 cases mortality, 2 cases with acute rejection, 2 cases with bile complication (bile leak and bile duct stenosis), 1 case with warm ischemia, 1 case with renal failure, 1 case with HBV replication, 1 case with necrotizing pulmonitis, 1 case with infection, 1 case with steal syndrome (relaparotomy).

Conclusion: Since started LDLT in Mongolia, overall expenses estimated in 1.540.460 USD. The result of this project is Mongolian LT team had done 2 cases themselves under the control of ASAN medical center's surgeons in Mongolia. Cooperation will continue in the future.

[SYMPOSIUM 2] HOW TO ESTABLISH A NEW LDLT PROGRAM

11:47-11:54

New Liver Transplantation Program in Vietnam

Pham Huu Thien Chi

Department of Hepato-Bilio Pancreatic Surgery
Cho Ray Hospital, Vietnam

Cho Ray hospital (CRH) is the biggest hospital in South of Vietnam belonging to the Ministry of Health of Vietnam. Our program of liver transplantation (LT) was started in 2010 with the support of Asan Medical Center (AMC) including training and liver transplantation surgery.

First training course was started on October 2010 for surgeons, anesthesiologist, instrument nurse. In the next years, our team was, in turn, trained in different specialties: pathology, ICU, radiology, ICU nursing, interventional radiology, surgery.

The first liver transplantation case at our hospital was performed on October 12, 2012 after a long time for looking for patient and donor. Till now, there were 5 cases of living donor LT and one case of deceased donor LT at CRH. One case was transfered to AMC for urgent LDLT on December 2012.

Case by case, our team has been growing up in preoperative preparation for donor and recipient, surgical techniques, postoperative ICU management, outpatient follow-up.

[SYMPOSIUM 2] HOW TO ESTABLISH A NEW LDLT PROGRAM

11:54-12:00

Successful outcome of living donor liver transplantation in National Scientific Medical Research Center

Zhaksylyk Doskaliyev

Department of Organ and Tissue Transplantation
Astana Medical University, Kazakhstan

Let me start from introduction about our country which located in Central Asia, south of Russia and northwest of China. The continental position of Kazakhstan in the center of the Eurasian continent is reflected in the entire physical and geographical make-up of the territory.

The population of our country more than 17 million. Among them Kazakhs are 53.4 percents, Russians is 30 percents, also there are about 200 nationalities live in KZ.

As you can see on the photo, all our nationalities live in a peace.

The total amount of patients on the waiting list for organ transplantation is 3855 in Kazakhstan.

prevalence of patients with chronic liver and kidney diseases

To solve the problem of waiting list the Transplantation Program in Kazakhstan Coordination was founded to create and coordinate the transplant service.

The coordination system is developing and covers all 16 regions of Kazakhstan. In the same way the living donor liver transplantation started, because the main problem is organ shortage and some patients die on the waiting list.

From 2011 in different centers of Kazakhstan were performed: 465 living-donor kidney transplantations; 55 cadaver donor kidney transplantations; 76 living-donor liver transplantations; 20 cadaver donor liver transplantations; 28 heart transplantation

There are 5 centers who started the Living donor liver transplantation program in Kazakhstan:

3 centers in Astana city (among them the National Scientific Medical Research Center) and 2 centers in South part of our country in Almaty city.

Under the government support from January of 2013 to January of 2015 twelve adult-to-adult living donor liver transplantations were performed in our center due to collaborative work with Seoul National University Hospital.

If I talk a little about our organization is JSC "NSMC" is a patient care, teaching and research center located in Astana city. The organization enhances healthcare and delivers proved brands to its customers – medical services by high technologies based on creative potential.

In NSMRC transplantation program started in 2013 by Professor Lee Kwang Woong, and first case was performed under the collaborative work with Seoul National University Hospital, Seoul, South Korea

The main age of donors was between 21-30 years old and most of pairs were siblings.

As you can from this slide females were more than males. The main blood group consisted from A type. All pairs were

ABO-compatible.
Donor evaluation is performing by protocol we created with transplant team of SNUH.
The main point during evaluation is donor safety and we focus on volumetry which kindly performed by SNUH team.
The main indication for liver transplantation was Primary biliary cirrhosis, and second place among causes was hepatitis B virus.
The transplantation procedure performed by standard protocol which was created in SNUH. In all cases right lobe was used.
Here you can see the procedure which done step by step.
Patient care after operation is important issue of whole transplantation. As you can see from this slide we keep all these requests for successful results and outcome.
And among routine observations for us doppler US is on of the important which we check twice during first 7 days after operation.
We have the standard protocol of triple immunosuppression for patients.
It was no complications in donor side.
In conclusion our collaborative work showed that transplant team of our center could get an extensive experience, including selection of the recipient and timing of transplantation, the operative procedure itself, prevention and treatment of complications.
International collaborative work and experience exchange rapidly can improve treatment outcomes.

[SYMPOSIUM 2] HOW TO ESTABLISH A NEW LDLT PROGRAM

12:00-12:10

Outreach LDLT Program

Susumu Eguchi

Department of Surgery
Nagasaki University Graduate School of Biomedical Sciences, Japan

Because of researches on atomic bomb after effect, Kazakhstan and Nagasaki have had a long history of friendly collaboration, even in thyroid surgery field of our department. Based on the relationship, from July 2012, we have supported the development of living donor liver transplantation (LDLT) program collaborating in Syzganovs' National Scientific Center (SNSC), Almaty in Kazakhstan. Before starting actual surgery, we visited SNSC, and suggested some improvement to perform LDLT, including the staff of the surgeons, anesthesiologists, surgical instruments, the quality of ICU, and comprehensive diagnostic and therapeutic staffs. Also, we concluded the academic exchange agreement between Nagasaki Univ. and SMSC, to collaborate not only for the surgery but for the academic research in order to make it a project between universities.

In LDLT, the pretransplant assessment of both donor and recipient were done mainly via internet system, including the graft volumetry. In the transplant surgery, the Nagasaki Univ. team generally included 2 to 4 surgeons and 1 anesthesiologist, and at least 1 surgeon stayed 1 to 2 weeks after transplantation, to support the postoperative management, especially the Doppler ultrasound and immunosuppression. Also, we discussed each other via the network conference system when necessary. First, the surgeons of Nagasaki Univ. performed the whole part of the surgery both in the donor and recipient, which gradually shifted to the surgeons of SNSC, step by step. After these first 10 cases, they independently performed 11 LDLT successfully thereafter. During this period, we have accepted 2 graduate students from Kazakhstan to take a degree with basic animal research about regenerative medicine from October 2012, according to the academic exchange agreement. Based on these experience, we currently expand to support LDLT program in several countries, including Georgia and Myanmar. Our policy is to support the development of LDLT program each country to be independently performed by themselves, and collaborate not only for surgery but for the education of academic research and development of human resources.

[SYMPOSIUM 2] HOW TO ESTABLISH A NEW LDLT PROGRAM

12:10-12:20

How to support beginning of LDLT program

Kwang-Woong Lee

Department of Surgery
Seoul National University Hospital, Korea

Living donor liver transplantation (LDLT) is complicate and sensitive surgery compared to deceased donor liver transplantation (DDLT). Therefore, it has been called cutting-edge technique in surgical field and dream for surgeons. To establish successful independent LDLT program, many efforts are necessary. There are several steps to make successful program.

1. Initiation process: Surgeons start to have interest in LDLT and initiate short-term training and experience. And Surgeons request mentorship to mentor in well-established program.
2. The mentor visits hospital to assess the feasibility in terms of hardware and software(medical personnel)
3. After short-term training of related medical personnel, the first LDLT is performed with help of mentor team.
4. Boom-up of collaboration
5. Perform independent LDLT
6. Repeated training and study, and accumulation of experience
7. Reach successful & independent LDLT program

To establish successful LDLT program, one leading surgeon who prepare all equipment and medical person training is important. And continuous hospital support and good mentor are also important.

I hope you will have your own LDLT program soon.

[SYMPOSIUM 3] CURRENT EMERGING ISSUES AT LDLT

13:40-14:00

Optimal volumetric assessment of liver volume

Toru Ikegami

Department of Surgery and Science
Kyushu University, Japan

(1) Development of liver volumetry. Liver volumetry has been developed during recent 25 years, from manual film scanning followed by integration, to manual or automated 3-D volumetry, with significant savings of time and effort for volumtery.

(2) The discrepancy between calculated or expected volume, however, has been the major problem of concern in liver volumetry. It has been possibly attributed to the dehydration due to the high osmotic pressure of the preservation solution, increased in-situ liver volume in-situ due to enlarged liver due to the injection of contrast medium, or mismatch of the cutting line between the estimated and actual surgery.

(3) Simple calculation of hemiliver volume using standard liver volume and major portal diameter. Recently, Lee WC, et al. reported that each right or left hemiliver volume could be calculated by SLVxR2/(R2+L2) or SLVxL2/(R2+L2). Lin XZ, et al. re-evaluated the formula for standard liver volume and blushed up the previous formula as SLV x (AP2+PP2/(AP2+PP2+L2). They used SLV= 13Ht+12BW-1530 as the more correct standard liver volume.

(4) Evaluation of functional liver volume. Recently, functional liver volume, not actual liver volume, as become an interest. Kawaguchi, et al used ICG for evaluating the congested liver functional volume and revealed as 40% of uncontested area just after reperfussion. Our group evaluated incorporation of EOB on EOB-MRI and revealed that congested area has 70% of functional liver at one week after LDLT. We also evaluated the association of functional parameters and actual or functional liver volume, and confirmed that functional liver volume was much more significantly associated with biochemical liver function tests.

(Summary) The discrepancy between calculated and actual liver volume might be inherent nature in volumetry. Functional liver volume has becoming the field of interest.

[SYMPOSIUM 3] CURRENT EMERGING ISSUES AT LDLT

14:00-14:20

Role of Cine-portography in Patient with Portal Vein Thromsbosis

Deok-Bog Moon

Department of Hepato-Biliary Surgery and Liver Transplantation
Asan Medical Center, Ulsan University, Korea

[SYMPOSIUM 3] CURRENT EMERGING ISSUES AT LDLT

14:20-14:40

Living Donors and Donor-Recipient Matching Using a Novel Living Donor Risk Index

Kim Olthoff

Department of Surgery
Hospital of the University of Pennsylvania, USA

Recently published data suggest long-term graft and patient outcomes among recipients of living donor liver transplant (LDLT) recipients are as good, if not superior, to those receiving a deceased-donor (DDLT) (1). Careful donor/recipient matching can result in excellent outcomes in both settings, but there are limited objective measures in LDLT. Early reports among US LD recipients suggested that MELD score was not a strong predictor of survival, thought to be due to the relatively conservative MELD scores considered for LDLT in the US, however, recent data from the SRTR report does show decreased survival for MELD ≥ 20 compared to LDLT for MELD < 20.

While numerous prediction models have been proposed for DDLT, there have few models specific to LDLT, and risk stratification has relied largely on limited quantitative measures (e.g., donor age, graft weight, graft-to-body-weight ratio (GBWR), and MELD score) and subjective clinician judgment. Two algorithms to predict post-LDLT graft survival have recently been developed: one based on LDLT recipients at a single Japanese center from 2006-2013, and a second of all US LDLT recipients from 2002-2012 (2,3). The Japanese score included donor age, graft weight, and MELD score, but also included an intra-operative variable of intra-operative shunt ligation. The US-based LDLT risk score is based on three donor (age, weight, graft type) and four recipient characteristics (age, weight, diagnosis, serum albumin) that are available pre-operatively. This score can provide an opportunity for waitlist candidates with one or more potential living donors to estimate post-LDLT outcomes depending on the donor chosen. The score had modest prediction accuracy, and classified recipients as low, intermediate, and high-risk, with predicted 1-year graft survival ranging from >91% in the lowest risk group to <83% in the highest risk group, and 3-year graft survival ranging from >87% in low risk to <73% in high risk donor/recipient pairs.

This LDRI score had limitations, as it was derived solely form the LDLT experience in the US where most are done in low MELD recipients. We wished to externally validate the LDLT score in other countries where LDLT is the primary option for transplantation; and assess whether addition of MELD or graft weight improved the score's performance. Data from two LDLT centers in India (426 LDLTs) and Korea (463 LDLT) were obtained. The AUC was calculated to measure the score's ability to discriminate patients with 1-year graft failure. These institutions had more patients receiving LDLT with MELDs >25 (India 22%, South Korea 17%) than in the US cohort. The 1-year graft survival was 89.2% in the Indian and 94.7% Korean cohorts, respectively. Compared to the original US cohort, the recalibrated

score performed similarly in the Indian cohort (AUC, 0.61; 95% CI: 0.51-0.71), with stronger prediction accuracy among the Korean cohort (AUC, 0.67; 95% CI: 0.54-0.80). Incorporation of graft weight or graft-to-body-weight ratio did not change the AUC of the risk score, while addition of MELD score yielded a non-significant, but numerically increased AUC.

Although further refinement is needed, a LDRI can be beneficial for predicting possible post-transplant outcomes and use for patient counseling and decision making with regard to choosing LDLT over DDLT and choosing a donor if there are multiple potential living donors. Future studies may incorporate other covariates that could improve the prediction accuracy of the model, such as percentage of micro- and macro-steatosis, number of biliary anastomoses, venous outflow reconstruction, and portal flow modulation.

1. Olthoff KM, Smith AR, Abecassis M et al. Defining Long-Term outcomeswiht living donor liver transplantation in the US. Ann Surg. 2015;262465-75
2. Goldberg DS, French B, Abt PL, Olthoff K, Shaked A. Superior survival using living donors and donor-recipient matching using a novel living donor risk index. Hepatology. 2014;60:1717-26.
3. Yoshizumi T, Ikegami T, Bekki Y, et al. Re-evaluation of the predictive score for 6-month graft survival in living donor liver transplantation in the modern era. Liver Transpl. 2014;20:323-32

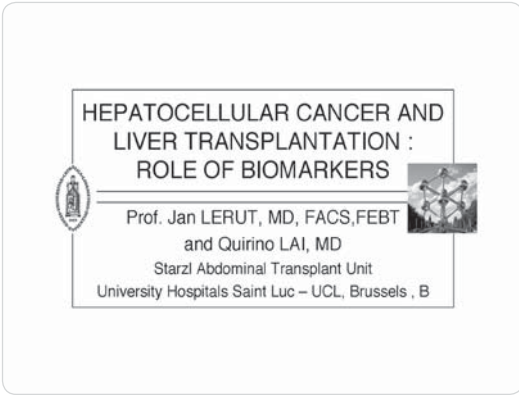
[SYMPOSIUM 3] CURRENT EMERGING ISSUES AT LDLT

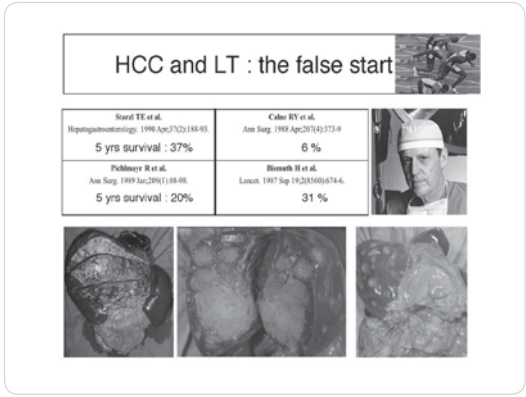
14:40-15:00

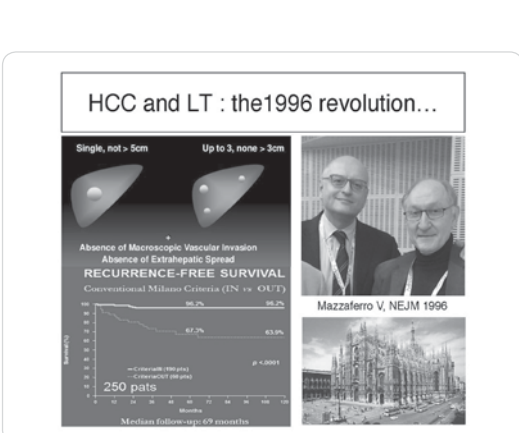
HEPATOCELLULAR CANCER AND LIVER TRANSPLANTATION : ROLE OF BIOMARKERS

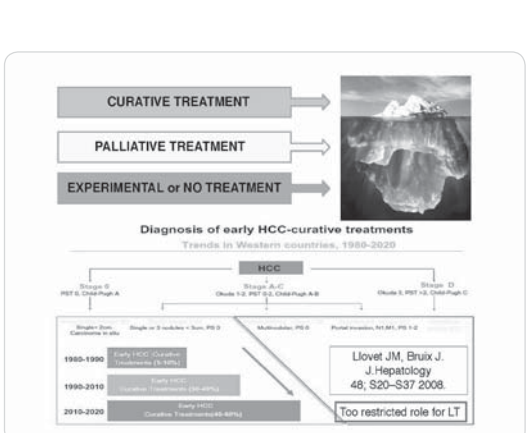
Jan Lerut

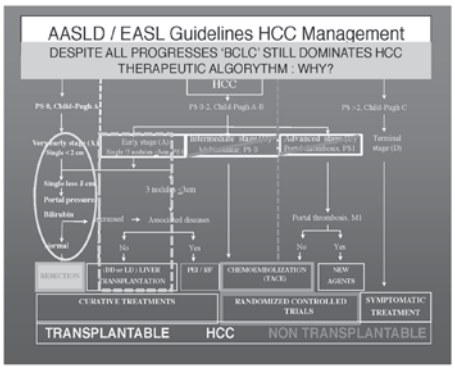
Department of Abdominal and Transplantation Surgery
University Hospitals Saint Luc UCL Brussels, Belgium

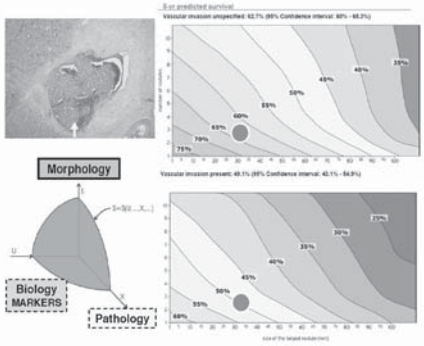








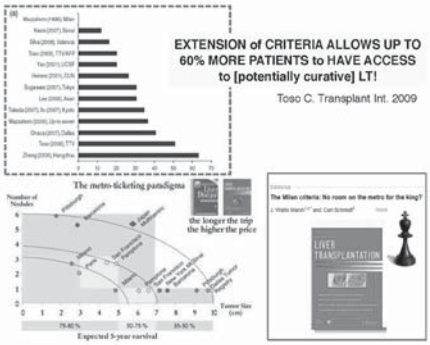




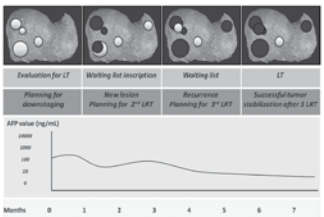
HCC and LT : extension of criteria

Original author (year), abbreviation	Criteria	Reported 5-year patient survival (no. patients)
Mazzaferro (1996), Milan	1 HCC ≤5 cm or ≤3 HCC ≤3 cm	85% * (35)
Yao (2001), UCSF	1 HCC ≤8.5 cm or ≤3 HCC ≤4.5 cm with cumulated diameter ≤8 cm	Milan: 72% (46) EC: 73% (14)
Herrero (2001), CUN	1 HCC ≤6 cm or ≤3 HCC ≤5 cm	Milan: 70% (59) EC: 73% (26)
Yao (2007), UCSF	Same as Yao (2001)	Milan: 80%† (133) EC: 82%† (38)
Onaca (2007), Dallas	1 HCC ≤6 cm or ≤4 HCC ≤5 cm	Milan: 62 %† (828) EC: NA (130)
Kwon (2007), Seoul	HCC ≤5 cm without # restriction and AFP ≤400 ng/ml	Milan: 80% (59) EC: NA
Sugawara (2007), Tokyo	≤5 HCC ≤5 cm	Milan: 94%‡ (68) EC: NA (4)
Takada (2007), Ito (2007), Kyoto	≤10 HCC ≤5 cm	Milan: 73% (74) EC: NA (33)
Zheng (2008), Hangzhou	Total tumor diameter ≤8 cm or HCC grade I or II and AFP ≤400 ng/ml	Milan: 76% (152) EC: NA (22)
Lee (2008), Asan	≤6 HCC ≤5 cm	Milan: 78.3% (72) EC: NA (26)
Silva (2008), Valencia	≤3 HCC ≤5 cm with cumulated diameter ≤10 cm	Milan: 62% (231) EC: NA (26)
Toso (2008), TTV	TTV ≤115 cm³	Milan: 78% (157) EC: 72% (84)
Mazzaferro (2009), Up-to-seven	Number + maximum size of HCC = 7	Milan: 73% (444)

MAINLY MORPHOLOGIC CRITERIA
"NUMBERS AND DIAMETER"



HCC and LT: first extension based on biology



Lai Q, Lerut J. α-Fetoprotein and hepatocellular cancer recurrence : a paradigm of the chaos theory. Liver Transpl 2014.

Lai Q, Levi Sandri GB,Lerut J.The selection tool alpha-fetoprotein for patients waiting for liver transplantation : How to easily manage a fractal algorithm. Wrd.J.Hepatology 2015.

HCC and LT: first extension based on …both tumor morphology and biology

Original author (year), abbreviation	Criteria	Reported 5-year patient survival (no. patients)
Mazzaferro (1996), Milan	1 HCC ≤5 cm or ≤3 HCC ≤3 cm	85%* (35)
Yao (2001), UCSF	1 HCC ≤8.5 cm or ≤3 HCC ≤4.5 cm with cumulated diameter ≤8 cm	Milan: 72% (46) EC: 73% (14)
Herrero (2001), CUN	1 HCC ≤6 cm or ≤3 HCC ≤5 cm	Milan: 70% (59) EC: 73% (26)
Yao (2007), UCSF	Same as Yao (2001)	Milan: 80%† (133) EC: 82%† (38)
Onaca (2007), Dallas	1 HCC ≤6 cm or ≤4 HCC ≤5 cm	Milan: 62 %† (828) EC: NA (130)
Kwon (2007), Seoul	HCC ≤5 cm without # restriction and AFP ≤400 ng/ml	Milan: 80% (59) EC: NA
Sugawara (2007), Tokyo	≤5 HCC ≤5 cm	Milan: 94%‡ (68) EC: NA (4)
Takada (2007), Ito (2007), Kyoto	≤10 HCC ≤5 cm	Milan: 73% (74) EC: NA (33)
Zheng (2008), Hangzhou	Total tumor diameter ≤8 cm or HCC grade I or II and AFP ≤400 ng/ml	Milan: 76% (152) EC: NA (22)
Lee (2008), Asan	≤6 HCC ≤5 cm	Milan: 78.3% (72) EC: NA (26)
Silva (2008), Valencia	≤3 HCC ≤5 cm with cumulated diameter ≤10 cm	Milan: 62% (231) EC: NA (26)
Toso (2008), TTV	TTV ≤115 cm³	Milan: 78% (157) EC: 72% (84)
Mazzaferro (2009), Up-to-seven	Number + maximum size of HCC = 7	Milan: 73% (444)
Toso (2008), PVDAP	HCC ≤115 cm³ and AFP ≤400 ng/ml	Milan: 71%‡ (83) EC: 65%‡ (148)

IMAGING

BIOLOGY

*Four-year survival; †recurrence-free survival; ‡3-year survival.
EC, beyond Milan and within expanded criteria; TTV, total tumor volume; AFP, alpha fetoprotein; NA, not available.

HCC and LT: first extension based on …major role of LDLT [in Asia]

Institution	Year	No.	Criteria	Overall survival (%) Within criteria	Beyond criteria
Milan (3)	1996	48	One tumor ≤5 cm, or ≤3 tumors, each ≤3 cm	85*	56*
UCSF (59)	2001	70	One tumor ≤6.5 cm, or ≤3 tumors, each ≤4.5 cm Total tumor diameter ≤8 cm	75*	<30*
UCLA (57)	2007	467	UCSF	81*	32*
Tokyo (60)	2007	78	≤3 tumors, each ≤5 cm (5-5 rule)	94[6]	56[6]
Kyoto (62)	2007	136	Up-to-seven criteria PIVKA-II ≤400 mAU/ml	82*	32*
Navarra (19)	2007	85	Up-to-seven criteria ≤3 tumors, each ≤3 cm	-	-
Seoul (63)	2007	140	Up to 6 tumor diameter ≤5 cm AFP ≤400 ng/ml	71[6]*	23*
Fukuoka (64)	2007	40	Any number, tumor diameter ≤5 cm	77[6]*	46[6]*
Hangzhou (61)	2008	195	Total tumor diameter ≤8 cm; or total tumor diameter >8 cm and histopathological grade I or II and preoperative AFP level ≤400 ng/ml	75*	19*
Metroticket (65)	2009	1356	Tumor size (cm)+number ≤7	71*	48*

LIVING DONOR LT AS A FERTILE SOIL TO EXPLORE BOUNDARIES OF INCLUSION BECAUSE OF BETTER CONTROL OF FACTORS TIME AND TUMOR …WITH CONTAINMENT OF THE TICKET PRICE !

THE STILL USED MC UNJUSTIFIEDLY EXCLUDE PATS FOR LT

HCC and LT : tumor biology

Forner A, Reig M, Bruix J. **Alpha-fetoprotein for HCC diagnosis: the demise of a brilliant star.** Gastroenterology 2009;137:26-29.

Author (year), abbreviation	Criteria
Only radiological criteria	
Mazzaferro [52], Milan	1 HCC ≤ 5 cm or ≤3 HCC ≤3 cm
Yao [53], UCSF	1 HCC ≤ 6.5 cm or ≤3 HCC ≤ 4.5 cm with TTD ≤ 8 cm
Herrero [54], CUN	1 HCC ≤ 6 cm or ≤3 HCC ≤5 cm
Onaca [55], Dallas	1 HCC ≤ 6 cm or ≤4 HCC ≤5 cm
Sugawara [56], Tokyo	≤3 HCC ≤ 5 cm
Lee [57], Asia	≤6 HCC ≤ 5 cm
Silva [58], Valencia	≤3 HCC ≤ 5 cm with TTD ≤ 10 cm
Toso [59], TTV	TTV ≤ 115 cm³
Mazzaferro [60], Up-to-seven	Number + maximum size of HCC = 7
Fan [61], Shanghai	1 HCC ≤ 9 cm or ≤3 HCC ≤ 5 cm with TTD ≤ 9 cm
Criteria needing preoperative biopsy	
Cillo [62], Padua	Tumor grading I or II
Zheng [63], Hangzhou	TTD ≤ 8 cm or HCC grading I or II and AFP ≤ 400 ng/mL
Combined radiological and biological criteria	
Kwon [64], Seoul	HCC ≤ 5 cm (no number restriction) and AFP ≤ 400 ng/mL
Takada , Ito [65, 66], Kyoto	≤10 HCC ≤ 3 cm and DCP ≤ 400 mAU/mL.
Toso et al. [35], TTV/AFP	TTV ≤ 115 cm³ and AFP ≤ 400 ng/mL
Lai et al. [67], TTD/AFP	TTD ≤ 8 cm and AFP ≤ 400 ng/mL

HCC: hepatocellular carcinoma. TTD: total tumor diameter. TTV: total tumor volume. AFP: alpha fetoprotein. DCP: des-γ-carboxy prothrombin.

Review Article

Alpha-Fetoprotein and Novel Tumor Biomarkers as Predictors of Hepatocellular Carcinoma Recurrence after Surgery: A Brilliant Star Raises Again

Qubrina Lai,[1] Fabio Melandro,[1] Rafael S. Pinheiro,[1] Andrea Dondfrancesco,[1] Bashir A. Fadel,[1] Giovanni B. Levi Sandri,[1] Massimo Rossi,[1] Pasquale B. Berloco,[1] and Fabrizio M. Frattaroli[1]

LIVER TRANSPLANTATION 19:1108–1118, 2013

ORIGINAL ARTICLE

Alpha-Fetoprotein and Modified Response Evaluation Criteria in Solid Tumors Progression After Locoregional Therapy as Predictors of Hepatocellular Cancer Recurrence and Death After Transplantation

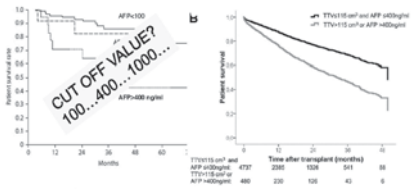
Quirino Lai,[1] Alfonso W. Avolio,[1] Ivo Graziadei,[2] Gerd Otto,[3] Massimo Rossi,[1] Giuseppe Tisone,[1] Pierre Galletta,[1] Wolfgang Hogan,[2] Michael R. Pitton,[3] Jan Lerut,[4] and on behalf of the European Hepatocellular Cancer Liver Transplant Study Group

GASTROENTEROLOGY 2012;142:986–994

Liver Transplantation for Hepatocellular Carcinoma: A Model Including α-Fetoprotein Improves the Performance of Milan Criteria

CHRISTOPHE DUVOUX,[1,2] FRANÇOISE ROUDOT-THORAVAL,[3,4] THOMAS DECAENS,[5,6] HASSENINE PESSIONE,[7] IVANA DAERAN,[8] TULIO PAZIENZA,[9] GUILLAUME TRAVOUILLON,[10] CLAIRE VANLEMMENS,[11] JÉRÔME DUMORTIER,[12] SEBASTIEN DI-BARBARO,[13] JEAN-CLOTAIRE ERR,[14] PIERRE-HENRI BERNARD,[15] RENÉ ADAM,[16] SYLVIE RADENNE,[17] FABRICE MUSCARI,[18] FLORENCE CONTI,[19] JEAN HARDWIGSEN,[20] GEORGES-PHILIPPE PAGANUZZI,[21] OLIVIER CHAZOUILLÈRES,[22] SYVREM SALAME,[23] MARIE-NOËLLE HILLERET,[24] PASCAL LEBRAY,[25] ARMAND ABERGEL,[26] MARILYNE DEBETTE-GRATIEN,[27] MICHEL D. KLUGER,[28] ANNRAI NUR LAI,[1,29] DANIA JUNIEN,[30] ALEX GUTIÉRREZ,[31] and LABRAN CHAMSEDINE,[32] on behalf of the Liver Transplantation French Study Group

HCC and LT : static AFP value



Kwon CHD Dig Dis 2007 | Toso C Hepatology 2009

HCC and LT : static AFP value

TRANSPLANT INTERNATIONAL

Liver transplantation for hepatocellular cancer: UCL experience in 137 adult cirrhotic patients. Alpha-fetoprotein level and locoregional treatment as refined selection criteria

Research Article

Recurrence of hepatocellular cancer after liver transplantation: The role of primary resection and salvage transplantation in East and West

Quirino Lai,[1,2,3] Alfonso W. Avolio,[4] Jan Lerut,[5] Carmelina Sanna,[6] Yun-Ching Chen,[7] Pasquale B. Berloco,[8] Giuseppe Tisone,[9] Salvatore Agnes,[10] Kenneth S. Chan,[11] William Sharp,[12] Massimo Rossi,[13] Tommaso M. Manzia,[14] Chung-Mau Lo[15]

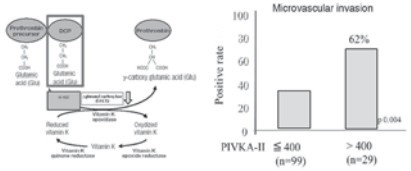
Table 5. Results of the multivariate analysis assessing the impact on disease-free patient survival in 137 cirrhotic patients transplanted during the period March 1987–November 2005

	OR (95% CI)	P
All variables*		
AFP level ≥400 ng/ml	4.86 (1.26–17.34)	0.01
Microvascular invasion	3.58 (1.34–9.54)	0.01
>3 nodules at pathology	5.87 (1.05–25.14)	0.05
Corticosteroid resistant rejection needing anti-lymphocytic antibodies	4.56 (1.00–21.28)	0.05
Only pre-operatively available variables**		
AFP level ≥400 ng/ml	5.13 (2.80–14.76)	<0.0001
UR†	0.42 (0.18–0.98)	0.04
LT before 1996	3.70 (0.91–40.33)	0.06
Downstaging	0.49 (0.20–1.21)	0.12

*n/AUC=182.71.
**n/AUC = 96.85.

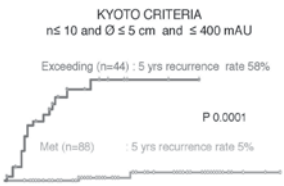
Variables	OR	95% CI	p value
mVI	11.34	3.30-34.28	<0.0001
AFP >400 ng/ml	5.91	2.61-13.39	<0.0001
Diameter largest tumor >5 cm	5.64	2.29-13.89	<0.0001
Living donation	3.80	1.85-7.77	<0.0001
Italy vs. Hong Kong	0.29	0.14-0.60	0.001
Poor tumor grading	3.75	1.65-8.55	0.002
Number of tumors >3	3.46	1.48-8.05	0.004
MC-out	2.79	1.39-5.59	0.004
Previous UR	3.42	1.36-8.61	0.009

HCC and LRT : static PIVKA-II value

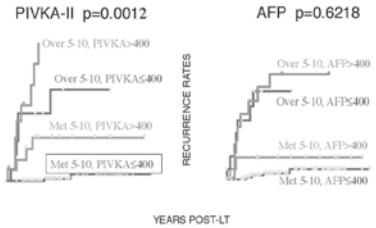


DCP stimulates hepatocytic and endothelial cell growth > directly involved in angiogenesis and also a parameter for tumor agressiveness

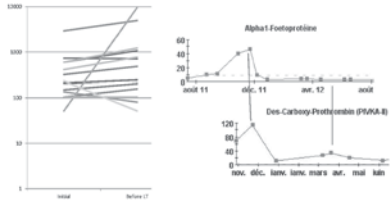
HCC and LT : static PIVKA-II value



HCC and LT : static AFP and PIVKA-II recurrence risk stratified by 5-10 rule



HCC and LT : AFP and PIVKA-II



Pre-LT DCP in 'normal AFP' pats DCP dynamics under LRT

HCC ad LT : static AFP+PIVKA values

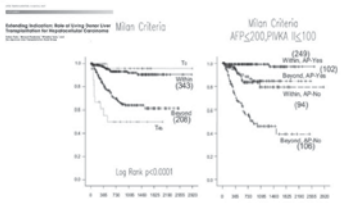
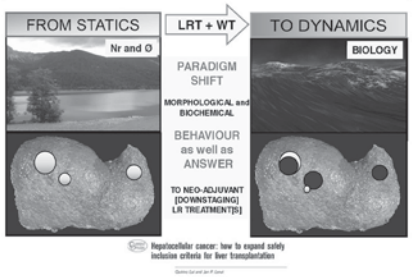
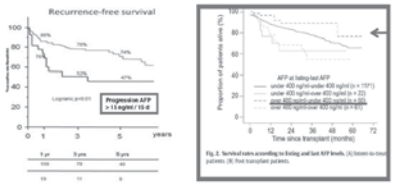


Figure 8. Milan criteria and A-P (alfa-fetoprotein ≤200 ng/mL and protein induced by vitamin K absence or antagonism factor II ≤100 mAU/mL) levels (imaging diagnoses).

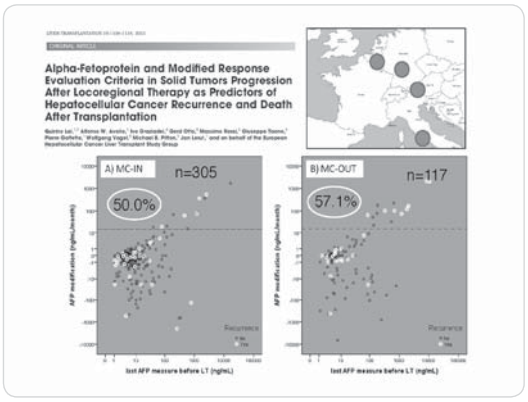
HCC and LT : next extension…dynamics



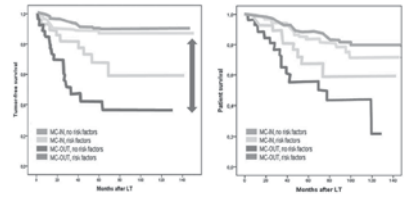
HCC and LT : dynamic AFP value



Vibert E et al.,Am J Transpl 2010 Merani Sh et al, J.Hepatol,2011



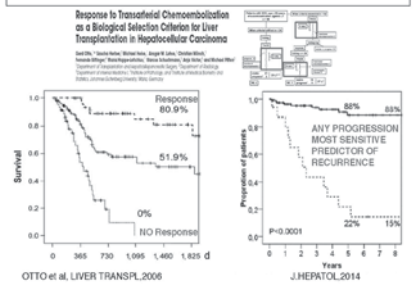
HCC and LT : dynamics tumor



Risk factors: AFP slope > 15 ng/mL/month and mRECIST progression

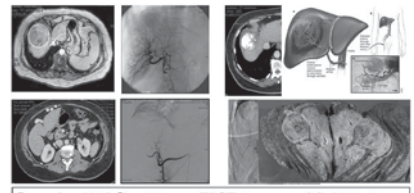
Lai Q, et al; European Hepatocellular Cancer Liver Transplant Study Group. Alpha-fetoprotein and modified response evaluation criteria in solid tumors progression after locoregional therapy as predictors of hepatocellular cancer recurrence and death after transplantation. *Liver Transpl 2013;19(10):1108-18.*

HCC and LT : dynamics tumor



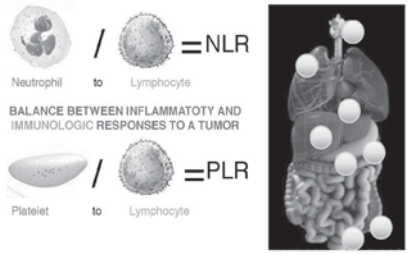
OTTO et al, LIVER TRANSPL_2006 J.HEPATOL_2014

HCC and LRT : dynamics tumor and LRT



December 2005 Ø 83 mm TACEx3 July 2006 49mm
AFP 674 ng/ml 4,2 ng/ml
March 2007 LT 100% tumor necrosis ; one satellite nodule 11 mm

HCC and LT : inflammatory markers



HCC and LT : NLR literature

Author, year	Moment detection	Cut-off values	Number	TFS	DFS	PS
Gomez et al. [18] 2008	Pre-resection	< 5	70	-	18.0*	-
		≥ 5	26	-	8.0*	-
Halazun et al [22] 2009	Pre-LT	< 5	137	-	75.0**	64.0**
		≥ 5	13	-	25.0**	28.0**
Huang et al. [19] 2011	Post-TACE	< 3.3	86	-	-	12.0*
		≥ 3.3	59	-	-	8.0*
Wang et al. [23] 2011	Pre-LT	< 3	68	-	64.9**	61.8**
		≥ 3	33	-	28.5**	19.5**
Bertuzzo et al. [24] 2011	Pre-LT	< 5	147	89.5**	-	-
		≥ 5	23	6.3**	-	-
Chen et al. [21] 2012	Post-RF	< 2	58	45.3*	-	-
		2-3.2	45	53.7*	-	-
		> 3.2	55	0.0*	-	-
Pinato et al. [20] 2012	Post-TACE	< 5	29	-	-	36.7*
		≥ 5	9	-	-	10.6*
Pinato et al. [17] 2012	-	< 5	79	22.3*	-	-
		≥ 5	25	9.5*	-	-


Research Article

EASL JOURNAL OF HEPATOLOGY

A novel and validated prognostic index in hepatocellular carcinoma: The inflammation based index (IBI)

David J. Pinato[1,2], Justin Stebbing[1], Mitsuru Ishizuka[3], Shahid A. Khan[2], Harpreet S. Wasan[2], Bernard V. North[4], Keiichi Kubota[3], Rohini Sharma[1,*]

TRANSPLANT INTERNATIONAL

Transplant International ISSN 0934-0874

ORIGINAL ARTICLE

Neutrophil and platelet-to-lymphocyte ratio as new predictors of dropout and recurrence after liver transplantation for hepatocellular cancer

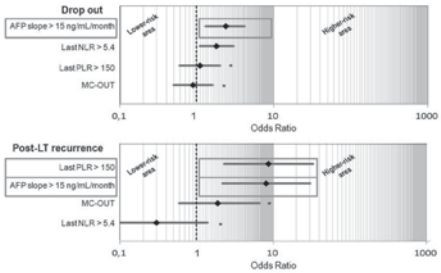
Quirino Lai,[1,2*] Edward Castro Santa,[3,4] Juan M. Rico Juri,[1,4] Rafael S. Pinheiro[1,5] and Jan Lerut[1]

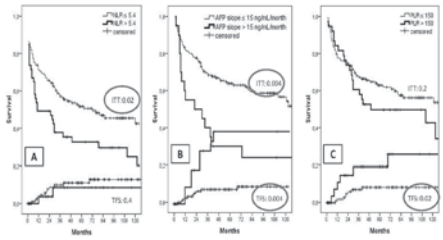
LIVER TRANSPLANTATION

Liver Transpl. 2014 Aug 1. doi: 10.1002/lt.23969. [Epub ahead of print]

Inflammation-based scores do not predict post-transplant recurrence of hepatocellular carcinoma (HCC) in patients within Milan criteria.

Lai Q, et al. Neutrophil and platelet-to-lymphocyte ratio as new predictors of dropout and recurrence after liver transplantation for HCC.Transplant Int. 2014; 27:32-41
Lai Q, Lerut J. Inflammation-based scores and HCC:"Faithful friends are hard to find". Liver Transpl 2014;20:1527-1528.





Good predictor of drop-out | Good predictor of drop-out and recurrence | Good predictor of recurrence

FURTHER STEP > AIS (Alpha-fetoprotein – Inflammation Score)

Variables	Entire population* (n=208)	Dropped-out patients (n=36)	Transplanted patients (n=172)
	Median (IQR) or n (%)		
Age (years)	59.1 (54.8-63.3)	60.3 (54.6-64.1)	58.9 (54.8-63.5)
Female gender (%)	46 (22.1)	11 (30.6)	35 (20.3)
Underlying cirrhosis (%)			
HBV	34 (16.3)	7 (19.4)	27 (15.7)
HCV	77 (37.0)	11 (30.6)	66 (38.4)
Radiological HCC features at WL inscription			
number of lesions	1 (1-2)	1 (1-2)	1 (1-2)
diameter largest lesion (cm)	2.5 (1.7-3.5)	2.6 (1.8-3.7)	2.5 (1.8-3.6)
MC-OUT status (%)	48 (23.1)	9 (25.0)	39 (22.7)
Radiological HCC features before LT or Drop Out (DO)			
number of lesions	1 (0-1)	1 (0-3)	1 (0-1)
diameter largest lesion (cm)	1.0 (0.0-2.2)	1.8 (0-3.1)	0.9 (0.0-2.0)
MC-OUT status (%)	21 (10.1)	13 (36.1)	8 (4.7)
LRT (%)			
total number of LRTs	185 (88.9)	34 (94.4)	151 (87.8)
mRECIST status (%) §			
complete-partial response	125 (67.6)	17 (50.0)	108 (71.5)
stability	23 (12.4)	0 (-)	23 (15.2)
progression	37 (20.0)	17 (50.0)	20 (13.2)
Wait List (WL) time (months)	5.3 (2.3-10.0)	5.5 (2.0-11.0)	5.3 (2.6-10.0)

§ % calculated only on patients treated with LRTs (n=185)
Prospective UCL-Brussels **database** of 208 HCC pats on wait list during the period Jan.1996-March 2012. In Nov.30, 2014, median ITT follow-up was 3.6 years (IQR range 1.0-7.8)

HCC and LT : AIScore

Variables	Entire population (n=208)	Dropped-out patients (n=36)	Transplanted patients (n=172)
	Median (IQR) or n (%)		
AFP (ng/mL)			
at WL inscription	9.5 (4.6-43.5)	17.0 (5.8-44.1)	8.6 (4.4-42.1)
last value before LT or DO	8.3 (3.9-44.0)	12.3 (4.1-187.8)	7.8 (3.8-36.8)
> 1000 ng/mL (%)	8 (3.8)	6 (16.7)	2 (1.2)
Albumin at LT or DO (g/dL)	3.3 (2.8-3.8)	2.9 (2.5-3.6)	3.3 (2.9-3.8)
< 3.5 (g/dL)	124 (59.6)	23 (63.9)	101 (58.7)
CRP at LT or DO (mg/dL)	0.6 (0.3-1.8)	1.3 (0.7-2.1)	0.5 (0.3-1.6)
≥ 10 mg/dL	9 (4.3)	2 (5.6)	7 (4.1)
PLR at LT or DO	93.0 (64.0-139.4)	106.7 (65.1-154.4)	90.3 (63.8-133.7)
≥ 150	43 (20.7)	10 (27.8)	33 (19.2)
NLR at LT or DO	3.4 (1.9-5.7)	4.3 (3.0-9.4)	3.1 (1.8-5.3)
≥ 5.0	61 (29.3)	16 (44.4)	45 (26.2)

Abbr: n, number; IQR, inter-quartile ranges; AFP, alpha-fetoprotein; WL, waiting list; DO, drop-out; C-reactive protein ; PLR, platelet-to-lymphocyte ratio ; NLR, neutrophile-to-lymphocyte ratio.

HCC and LT : AIScore

Variables	Transplanted patients (n=172)	Recurrence patients (n=14)
	Median (IQR) or n (%)	
HCC features at pathology		
number of lesions	1 (0-2)	3 (1-5)
diameter largest lesion (cm)	1.0 (0.0-2.0)	1.9 (1.4-4.1)
MC-OUT status (%)	34 (19.8)	10 (71.4)
Poor grading (%)	19 (11.0)	3 (21.4)
Microvascular invasion (%)	25 (14.5)	5 (35.7)
Macrovascular invasion (%)	1 (0.6)	1 (7.1)
Necrosis rate at pathology (%)§		
100%	50 (33.1)	1 (9.1)
31-99%	73 (48.3)	6 (54.5)
< 30%	28 (18.5)	4 (36.4)

§ Percentages calculated only on patients treated with LRTs (n=151)..

HCC and LT : AIScore

Multivariate analysis in relation to risk factors for drop-out or tumor recurrence

Variable	OR	95%CI	P value
AFP ≥ 1000 ng/mL	48.629	4.961-476.626	0.001
PLR ≥ 150	3.839	1.310-11.255	0.014
NLR ≥ 5	0.499	0.170-1.467	0.206

Hosmer-Lemeshow test: 0.082.
Variables initially included in the analysis: recipient gender, recipient age at the moment of waiting list inscription, HCV status, LRT, albumin < 3.5 g/dL, CRP ≥ 10 mg/dL.

2.127 (if MC-OUT) + 1.345 (if PLR ≥ 150) + 3.884 (if AFP ≥ 1000 ng/mL)

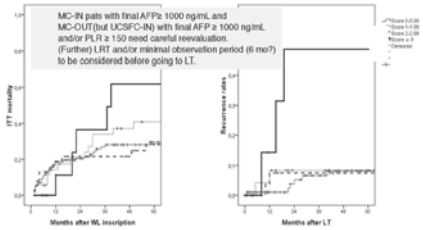
AIS (Alpha-fetoprotein – Inflammation Score)
The entire patient cohort was stratified in 4 groups: 0-0.99; 1-1.99; 2-2.99; ≥ 3

HCC and LT : AIScore

Variables	1-year	3-year	5-year	P value
ITT survival				
Score 0-0.99	81.3	72.0	70.5	
1-1.99	85.6	72.7	59.1	1 vs. 4 group = 0.549
2-2.99	81.3	78.4	71.7	2 vs. 4 group = 0.658
≥ 3	88.9	63.5	36.1	3 vs. 4 group = 0.395

Variables	1-year	3-year	5-year	P value
Recurrence				
Score 0-0.99	1.0	6.6	8.2	
1-1.99	8.3	8.3	8.3	1 vs. 4 group = < 0.0001
2-2.99	7.4	7.4	7.4	2 vs. 4 group = 0.072
≥ 3	14.3	48.6	48.6	3 vs. 4 group = 0.011

MC-IN pats with final AFP≥ 1000 ng/mL and MC-OUT(but UCSFC-IN) with final AFP ≥ 1000 ng/mL and/or PLR ≥ 150 need careful reevaluation.
(Further) LRT and/or minimal observation period (6 mo?) to be considered before going to LT.



HCC AND LT : Hangzhou-NLR Score

Combined Hangzhou criteria with neutrophil-lymphocyte ratio is superior to other criteria in selecting liver transplantation candidates with HBV-related hepatocellular carcinoma

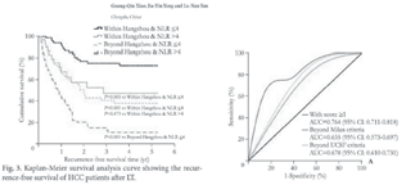
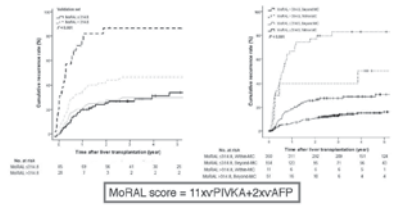


Fig. 3. Kaplan-Meier survival analysis curve showing the recurrence-free survival of HCC patients after LT.

Hepatobiliary Pancreat Dis Int 2015

HCC AND LT : MoRAL SNUH Score



MoRAL score = 11xvPIVKA+2xvAFP

82 MC-OUT pats had PVT tumor thrombus !

JH.LEE et al Submitted Ann.Surgery, 2015

HCC and LT : EXTENSION OF CRITERIA

- **TUMOR** MORPHOLOGY
  - "Milan criteria
  - Diameter
    - ≤ 3…5…6,5…8…9 cm
  - Number
    - < 3…3…5…10 nodules
  - Volume
    - 115…250 cm³
  - Location
    - mono- vs. bi-lobar
  - Invasion
    - micro-vascular
    - macro-vascular

More and Better!

- **TUMOR** BIOLOGY
  - Differentiation [=biopsy]
    - Edmonson-Steiner classification
  - Markers static
    - **A**FP 100…400…1000…3000 ng/ml
    - **P**IVKA II / DCP 100..300…400mAU-ng/ml
    - **Combined A-P** [AFP< 200 / DCP < 100]
  - Markers dynamic
    - AFP/DCP dynamics [> 15 ng/ml /14 d]
  - Neutro/Lymph and Plat/Lymph Ratios

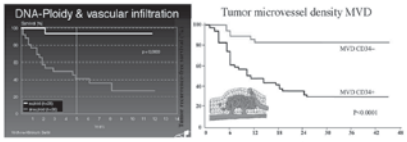
- **PRE-TRANSPLANT [LRT]**THERAPY
  - response : m-Recist AND tumor marker
  - CONTROL 'FACTOR TUMOR'
- **TYPE LT : DDLT vs. LDLT**
  - Selection : [much] wider criteria in LDLT
  - CONTROL 'FACTOR TIME'

.. and much more markers to come…genomic, cellular, functional…

HCC and LT:... more to come

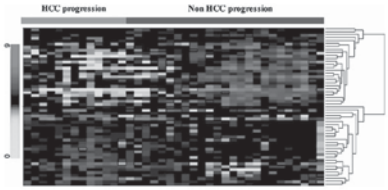
HEPATO-CARCINOGENSIS	MARKERS
Proliferation	p53, PTEN, c-met, c-myc, PCNA, Ki-67, granulin
Avoidance of apoptosis	p53, Bcl-2, survivin
Limitless replicative potential	Telomerase, TERT
Sustained angiogenesis	MVD, VEGF, angiopoietin
Tissue invasion and metastasis	Cadherin/catenin complex MMPs
Genomic instability	Chromosomal instability, microsatellite instability

HCC and LT :…some examples



Other markers… plasma albumin mRNA levels,[18] F-FGD/PET CT positivity…

HCC and LT :…genotyping



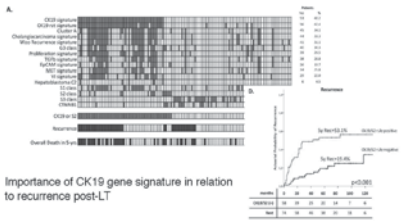
54 probe sets differentiate HCC progression in patients waiting for LT
98 probe sets were associated with post-LT survival (n=10)

Mas VR et al, *Transplantation*, 2007

HCC AND LT :…progenitor cell

Title: Progenitor cell markers predict outcome of patients with Hepatocellular Carcinoma beyond Milan criteria undergoing liver transplantation

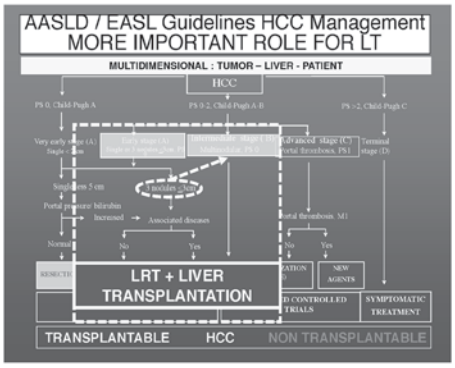
O.MILITIADOUS – JM.LLOVET group in press J.Hepatology.2015



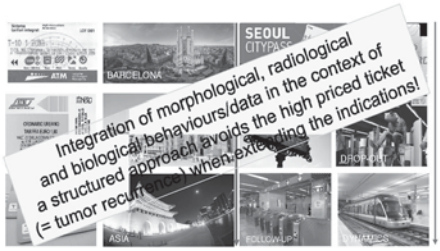
Importance of CK19 gene signature in relation to recurrence post-LT

HCC and LT – BIOMARKERS CONCLUSIONS

- Major paradigm shift in liver transplant oncology is necessary to expand inclusion criteria of HCC for LT
- Justified expansion of criteria implies
  - combination of both morphology (Nr and Ø) and biology
    - include all easily available serum markers [PIVKA-II…]!
    - the further from MC, the more important
  - evaluation of tumor dynamics
    - under optimal loco-regional treatment(s) defined by multi-modal /-disciplinary approach
- Implementing these 'rules' will allow to optimize
  - outcome of MC-IN pats (!)
  - inclusion of MC-OUT patients without compromising results
  - consider every patient w early/intermediate lesion(s) for LT



HCC and LT : BIOMARKERS CONCLUSIONS



[SYMPOSIUM 3] CURRENT EMERGING ISSUES AT LDLT

15:00-15:20

LT for Hilar Cholangiocarcinoma

Johnny C. Hong

Department of Surgery
Medical College of Wisconsin, USA

[VIDEO BATTLE] HOW DO I DO?

Battle 1: Pure Laparoscopic Donor Right Hemihepatectomy 16:20-16:30

How Do I Do? : Pure Laparoscopic Donor Right Hemihepatectomy

Choon Hyuck David Kwon

Department of Surgery
Samsung Medical Center, Sungkyunkwan University, Korea

Pure laparoscopic donor right hepatectomy has not been performed widely and standard procedure compatible to open liver resection has not been well described. A standardized procedure for purely laparoscopic donor right hepatectomy emphasizing the important knacks and pitfalls of each step will be described. It contains all the important surgical steps taken from the author's experience of more than 40 purely laparoscopic donor right hepatectomies.

The donor is laid on French position and the operator stands between the patient's legs. Three 12mm ports and two 5mm ports are used. The liver biopsy is initially taken for conformational biopsy followed by cystic duct and artery ligation. The gall bladder is not dissected to use as a retractor of the right liver. The falciform ligament and right coronary ligament is dissected first followed by right triangular ligament to fully mobilize the liver until the IVC is visualized from the right side. The right hepatic artery and portal vein is carefully dissected out from the Glissonean pedicle and clamped temporarily to verify the Cantlie's line. The parenchymal transection is carried out using ultrasonic shearing device. Blind transection with ultrasonic device is possible for the initial 1-2cm from the capsule but precise step by step dissection should be carried out in the deeper layer in order to not injure the hepatic branches. After transecting about 2/3 of the parenchyma and the caudate lobe, the bifurcation of the Glissonean branch may be fully visualized. A radiopaque marker is tagged at the estimated line of bile duct transection and an intraoperative cholangiogram is taken for final confirmation. The bile duct is transected sharply using scissors and the remnant bile duct is sutured using PDS 5-0. The remnant parenchymal transection is carried out both by anterior and caudal view. Once the transection of the parenchyma is finished, the graft is positioned inside the plastic bag and a Pfannenstiel incision is placed at suprapubic area and the end string brought out of the incision. The right hepatic artery is double clipped and divided. The right portal vein is stapled using unilateral TAE and divided using scissors after applying a bulldog clamp on the graft side to prevent backflow bleeding. All large hepatic veins are stapled on one side and bull dog clamped on the other likewise and the graft is retrieved through the previous incision.

The donor's hospital days is around 8 days. A routine DISIDA scan, Doppler USG and abdominal CT scan is taken to evaluate any possible complications. Purely laparoscopic donor right hepatectomy usually takes about 6-7 hours with major complication rate of less than 10% and may be performed relatively safe in experienced hands in both donor hepatectomy and advanced laparoscopic technique.

[VIDEO BATTLE] HOW DO I DO?

Battle 1: Pure Laparoscopic Donor Right Hemihepatectomy 16:30-16:40

Pure Laparoscopic Living Donor Right Hepatectomy for Adult Living Donor Liver Transplantation

Ki-Hun Kim

Department of HB Surgery and Liver Transplant
Asan Medical Center, Ulsan University, Korea

Living donor liver transplantation (LDLT) has been an effective treatment modality for patients with end-stage liver diseases since the deceased donors' organs have been decreased. In the early period of LDLT, the small-sized grafts such as left lateral section and left lobe have been used. However, liver transplantation surgeons have been known that the graft size is one of the most important factors in successful LDLT with the data between the graft size and patient's survival. Recently, a right lobe graft in LDLT has been accepted safely in experienced liver transplantation centers. Laparoscopic liver resection has been stationary developed in various kinds of liver diseases. The first report of laparoscopic living donor left lateral sectionectomy (LLS) for adult to pediatric LDLT was described by Cherqui et al. in 2002. After that, the comparative articles between laparoscopic LLS and open LLS have been demonstrated to be safe and reproducible, resulting in grafts similar to those obtained with open surgery. However, only a small number of centers have performed laparoscopic living donor hepatectomy until now especially, a right hepatectomy because the procedure can be performed only by well experienced hands in performing both laparoscopic liver surgery and liver transplantation with living donor liver grafts. The most important concern in LDLT is donor safety. If the donor is endangered by a new approach attempting to overcome shortcomings of the conventional procedure, the new approach should not be accepted. We should keep in mind that the laparoscopic approach for graft procurement in live donors should be performed in selected individuals with favorable anatomy as well as by teams with expertise in both laparoscopic liver surgery and LDLT.

Reference

1. Park JI, Kim KH et al. Laparoscopic Living Donor Hepatectomy: a review of current status. J Hepatobiliary Pancreat Sci 2015 (in press)
2. Kim KH, Jung DH et al. Comparison of open and laparoscopic live donor left lateral sectionectomy. Br J Surg 2011;98:1302–1308

[VIDEO BATTLE] HOW DO I DO?

Battle 2: Standard Anastomosis Technique: From HV to BD 16:55-17:10

Standard Anastomosis Techniques: From HV to BD in Kaohsiung Chang Gung Memorial Hospital

Chih-Che Lin

Department of Surgery
Chang Gung Memorial Hospital, Taiwan

At Kaohsiung CGMH, living donor liver transplantation cases have been exponentially increasing each year for the last 20 years, since we started our first case in 1994.To-date, we have performed a total of 1400 liver transplants. Eighty-six percent of which were LDLT and 75% were in adults.

For HV reconstruction of the recipients, wide venoplasty was performed in all cases. Simple extension of the right hepatic vein was performed in adult recipients for right graft, division of the common trunk of the left and middle hepatic veins in adult for left graft, and triple venoplasty including the right hepatic vein and common trunk of the middle and left hepatic veins for pediatric patients to create a wide and short orifice for HV anastomosis. Cryopserved vascular interposition graft or PTFE vascular graft are used to reconstruct outflow of V5/V8 territory.

For double portal vein reconstruction, we harvest Y-shape graft from recipient portal vein (distal part of main portal vein with right and left branches), then perform anastomosis in the back table with the graft double portal veins first to create simple orifice for PV anastomosis. In pediatric patients with a sclerotic and small portal vein, we leave a longer P4 stump in the left lateral graft. Intraoperative portal vein stenting through the P4 stump at the cut surface of the graft is performed if portal flow is inadequate.

Hepatic artery (HA) reconstruction has been routinely done by microsurgical techniques with continuous suture in the posterior wall and interrupted suture in the anterior wall. Right gastroepiploic artery is used as an alternative source for HA anastomosis in cases of HA damage. Radial artery is used for interposition graft if necessary.

The same microsurgical techniques have also been for biliary reconstruction performed since 2006, either duct-to-duct or duct-to-jejunum biliary reconstruction, to minimize complications.

[VIDEO BATTLE] HOW DO I DO?

Battle 2: Standard Anastomosis Technique: From HV to BD 17:10-17:25

Standard Anastomosis Technique: From HV to BD

Jae-Won Joh

Department of Surgery
Samsung Medical Center, Sungkyunkwan University, Korea

Introductions

The growing disparity between the number of liver transplantation candidates and the supply of deceased donor organs has motivated the development of living donor liver transplantation (LDLT).

The surgical technique of deceased donor liver transplantation (DDLT) and pediatric and adult left lobe (LL) LDLT has been standardized. However, right lobe (RL) LDLT is often technical challenging for its complex reconstructions.

Surgical technique of Samsung Medical Center

1. Right hepatic vein (RHV) reconstruction

The RHV is the primary outflow pathway for RL graft.

After checking the RHV length of RL graft, we do incision in the RHV root of a recipient side after a longitudinal partial clamping of IVC with Satinsky vascular clamp. To prevent stenosis of a vessel orifice, this is essential to incise larger than the graft RHV orifice.

Two double armed 4-0 prolene is used for RHV anastomosis. After doing tag suture in an upper and lower side of the vessel, we do suture the vessel wall continuously, from the posterior to the anterior wall. A growth factor is not given because of the difficulty of bleeding control in the site. And this vessel is large enough, so suture line stenosis is rare.

2. Inferior hepatic vein (IHV) reconstruction

IHV larger than 5mm in caliber is needed for revascularization. If there will be multiple IHV, circumferential patch-fence using autologous or cryopreserved vein will be needed in bench work.

We incise IVC wall with another partial clamp of IVC and do anastomosis in the same manner with RHV.

3. Portal vein reconstruction

We do high hilar dissection in most case. After resecting the hilum, recipient's portal vein is identified, and an iliac clamp is applied to the base of the main portal vein. All collateral veins from PV are ligated to prevent portal flow steal.

Two double armed 5-0 prolene are used for PV anastomosis. After tagging suture in 3 o' clock and nine o' clock, the vessel wall is sutured continuously with a tension free. A growth factor is given about 1/2 ~ 1/3 of PV diameter.

We check the portal flow and thrombosis before reperfusion, and heparin solution is flushed into the PV anastomosis site.

4. Reconstruction of middle hepatic vein (MHV) territory

MHV drainage of RL graft must be optimized to increase the safety margin and help alleviate graft-size disparity by avoiding anterior section congestion injury.

We check the size and caliber of MHV (V5/V8). A cryopreserved iliac vein or artery (Y-shape) is used for reconstruction. The cryopreserved graft anastomoses in bench work then attach to the root of MVH of the recipient. 5-0 prolene is used for anastomosis in the same manner with RHV.

5. Arterial reconstruction

The artery from graft is approximated to recipient side hepatic artery with two microclips. 8-0 prolene is used for anastomosis. The arteries anastomose with interrupted sutures using a surgical microscope.

We routinely check the arterial and venous flow using the intra-op US after arterial reperfusion.

6. Duct anastomosis

The tissue around CBD must be preserved for reducing biliary complications.

6-0 PDS was used for the duct-to-duct anastomosis. The interrupted suture is done from posterior to anterior duct wall without using a surgical microscope.

Hepaticojejunostomy (HJ) is needed for patients with prior radiotherapy covering hilar area for hepatocellular carcinoma (HCC).

Conclusion

Over the past decade, most of the issues related to the technical design of LDLT procedures have been solved. Based on our experiences, techniques described herein have demonstrably shown good result and low morbidity.

[VIDEO BATTLE] HOW DO I DO?

Battle 2: Standard Anastomosis Technique: From HV to BD 17:25-17:40

How I do it?
Standard anastomotic techniques – Hepatic vein to bile duct

Mohamed Rela

Institute of Liver Disease and Transplantation
Global Hospitals Group, India

Right lobe graft is the standard graft used in our program for adult LDLT. Left lobe grafts are used for bigger children and selectively for small adults. Left lateral grafts are used for pediatric transplantation. Right posterior grafts are used selectively in adults when right lobe graft is not feasible due to anatomical and safety issues.
Donors have to be close relatives, between 18 years and 50 years of age, blood group compatible and with no associated co-morbidities. Pre-operative donor liver biopsy is used selectively based on donor age and body mass index (BMI), liver attenuation index (LAI) on donor CT, serum triglycerides and transminases.

Right lobe implantation

Right lobe without middle hepatic vein (MHV) is the preferred graft in 90% of our adult LDLT practice at present. Right lobe with MHV is used selectively in young donors with good liver remnant (> 40%) and adequate drainage of segment IV through the marginal vein and the recipient status/ GRWR warrants it. Drainage for the anterior sector is achieved by back-table reconstruction of segment V and segment VIII veins (if greater than 5mm). Inferior right hepatic vein (IRHV) are implanted if they are of reasonable size (>5mm). Calculated GRWR of 0.7 is the minimum cut-off in our program.

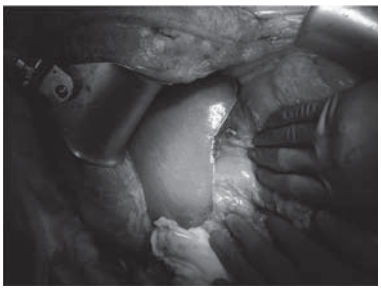


Figure showing the right lobe implanted with adequate drainage of the anterior sector with no congestion on the graft.

Back-table reconstruction:

Our preferred technique of reconstructing segment V/VIII is either using preserved ABO compatible cadaveric iliac vein grafts or PTFE tube grafts (8mm or 10mm). Mono segment drainage is usually achieved using a PTFE graft while

multiple segmental vein drainage is by a cadaveric iliac vein graft. Inferior right hepatic veins are usually harvested with a cuff of donor inferior vena cava and are implanted directly to the recipient vena cava. In case of right lobe graft with short MHV stump, an extension PTFE graft are used to enable a tension-free anastomosis to the recipient MHV. Bench venous reconstruction is done with 5-0 prolene continuous sutures and flushed to confirm the patency and to avoid any leaks.

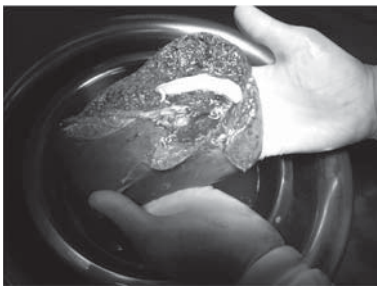


Figure showing backtable reconstructed segment V and VIII drainage with preserved cadaveric iliac vein graft.

Right hepatic vein anastomosis:

The graft RHV is anastomosed to the recipient RHV opening. The recipient RHV stump is excised after placing a larger Satinsky clamp on the cava without completely occluding the caval flow. The graft is then placed in the right subphrenic space in its anatomical position. The inferior corner stitch on the graft RHV is guided by the marker stitch placed during the donor operation and the superior stitch is placed anterior to the segment VII vein ostia in graft RHV to prevent graft rotation. The posterior layer is done with continuous sutures (using eversion technique) and continued on to the anterior layer to complete the anastomosis and tied after leaving a small growth factor.

Anterior sector drainage:

The LHV or MHV stump opening are usually used for reconstructing segment V/VIII veins. Once the choice is made, the other vein opening is closed with 4-0 prolene. The Satinsky clamp is reapplied over the open vein stump longitudinally to enable anastomosis in a vertical fashion. The PTFE or the cadaveric iliac vein is trimmed to avoid any kink or angulation. The anastomosis is performed similar to the RHV anastomosis with 5-0 prolene continuous sutures.

Figure showing reperfused right lobe graft with reconstructed segment V and VIII with preserved cadaveric iliac vein graft.

Inferior right hepatic vein anastomosis (IRHV):

The lie of the IRHV is studied carefully to assess its site on the cava on the donor CT scans relative to the RHV both longitudinally and axially. The corresponding location on the recipient IVC is partially clamped using a Satinsky clamp. A cavotomy is made and a small disc of caval wall is excised. The anastomosis is done with 5-0 Prolene continuous suture. In case of small IRHV (<10mm) or thin walled IRHV, interrupted anterior sutures are used.

The graft is flushed with 1 litre of normal saline before completion of all the hepatic venous anastomoses.

Portal vein reconstruction:

The recipient portal vein is skeletonised till the suprapancreatic part and usually requires ligation of the anterior superior pancreaticoduodenal vein. When the portal vein is partially thrombosed, an eversion thrombectomy technique is used to clear the thrombus and ensure good portal flow.

If the graft has a single portal vein orifice, anastomosis is completed in the standard fashion. If the graft has two portal vein orifices, the Y junction of the recipient portal vein is used to reconstruct them on the back-table to form a single orifice.

The graft is positioned anatomically, if required by the placement of a large swab behind the liver. Excess length of the recipient portal vein is excised. Corner sutures are placed ensuring that there is no rotation of the veins. Anastomosis is performed using 5-0 continuous suture. A generous growth factor is left before the suture is tied to allow for expansion of the anastomosis after reperfusion.

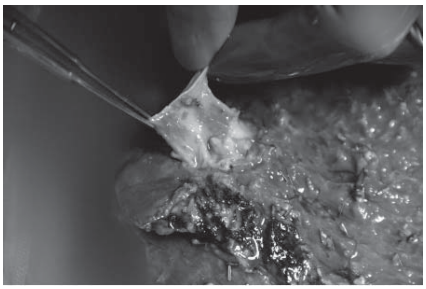


Figure showing backtable reconstructed two portal vein in the graft with recipient portal vein bifurcation.

Hepatic artery reconstruction

During recipient operation, the right hepatic artery is ligated to the right of the bile duct. Care is taken not to cause intimal dissection of the artery. The right hepatic artery of the recipient is anastomosed to the graft RHA. The anastomosis is completed using interrupted 8-0 Prolene sutures with all knots placed outside. Anastomosis is completed using 4.5X magnification loupes.

When there are two arteries in the graft with caliber discrepancy, the smaller artery is tested for adequate pulsatile backflow in the donor. If so, the smaller artery is ligated and the bigger artery is reconstructed. In case of inadequate backflow or equal sized double arterial grafts, the arteries are preferentially reconstructed in the bench using the

recipient hepatic artery bifurcation for the ease of having a single wider anastomosis in the recipient. Mismatch in the calibre of the vessels is managed with small equal adjustments made throughout the circumference.

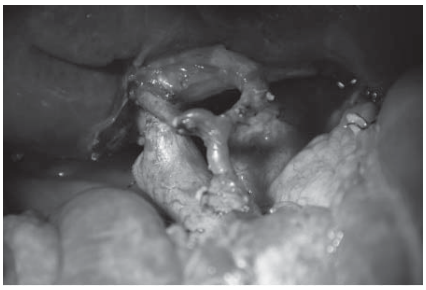


Figure showing double artery in the graft which was reconstructed in the bench using recipient RHA and LHA bifurcation and current status in the recipient with completed anastomosis.

Bile duct anastomosis:

When the graft has a single bile duct, the graft RHD is anastomosed to the recipient CHD or RHD using interrupted 7-0 PDS sutures. When RHD is used, any caudate duct opening is carefully identified and closed meticulously to prevent any leakage. In situations where the arterial anastomosis runs anterior to the CBD, complete mobilization of the CBD is done from the artery and biliary reconstruction is performed anterior to the artery to facilitate any future biliary reconstruction in case of stricture.

When there are multiple ducts on the graft, the technique of anastomosis depends on the size of ducts and the distance between the ducts. If the ducts are close together, a single anastomosis to the recipient CHD is done by placing sutures on the intervening hilar plate tissue. If the ducts are wide apart, then two anatomoses are preferred to the left and right hepatic ducts of the recipient CHD. Occasionally, if the two ducts are wide apart and cannot be dealt with as above, we complete a duct to duct anastomosis to the graft right posterior duct and recipient CHD, and use of Roux loop to drain the anterior duct.

Completion cholangiogram is done to ensure a leak free anastomosis. We also inject a small amount of Propofol through the cystic duct to identify any anastomotic or cut surface leaks so that they can be sutured.

Left lobe implantation

Hepatic vein reconstruction:

Back-table reconstruction:

Back-table preparation for a left lobe graft is minimal as the LHV and MHV usually have a common orifice. If the two veins open separately or the bifurcation is very shallow, then a circumferential extension graft (using saphenous vein or cadaveric preserved iliac vein) is used to produce a common orifice and extra length for wide anastomosis.

Left hepatic vein anastomosis:

The RHV orifice of the recipient is closed longitudinally. The graft LHV/MHV orifice is anastomosed to the recipient LHV/MHV opening. In case of size mismatch, the LHV/MHV orifice is extended to the right onto the caval wall. If the

discrepancy is significant, the cava is crossclamped and the three venous orifices are joined together and the graft implanted using the triangulation technique. The posterior layer is performed with continuous sutures (using eversion technique). The anterior layer is usually completed using interrupted prolene sutures.
The graft is flushed with 1l of normal saline before completion of all the hepatic venous anastomoses.

Portal vein reconstruction:
Left lobe grafts usually have a single portal vein orifice and anastomosis is completed in the standard fashion. If there is size mismatch, the confluence of the right and left portal veins in the recipient may be used to provide a wider recipient portal vein. Posterior layer is completed by continuous suture and anterior layer is completed using interrupted sutures.

Hepatic artery reconstruction:
The common hepatic artery or right hepatic artery of the recipient is anastomosed to the graft LHA. The anastomosis is completed using interrupted 8-0 Prolene sutures. If the graft has two arteries, the same principle is followed as in the right lobe.

Bile duct anastomosis:
Usually the graft has a single left hepatic duct and it is anastomosed to the recipient CHD using interrupted 7-0 PDS sutures. When the segment IV ducts is separate from segment II/III duct opening on the graft, the technique of anastomosis depends on the size of ducts and the distance between the ducts as in the right lobe.

Left lateral segment implantation
The implantation technique for the pediatric recipients with left lateral segment is quite different from the adult live donor liver transplantation in view of the large grafts with vessels caliber mismatch. Ideal graft weight in these age groups would be 1.5 and any grafts more than GRWR of 4 or a thicker graft in an infant requires non anatomical or anatomical reduction to accommodate the graft and facilitate skin closure.

Hepatic vein reconstruction:
The most common anatomy encountered is to have a single large left hepatic vein opening draining both segment II and III. To match this opening in a pediatric recipient, all three hepatic venous opening has to be connected and fashioned to have a wide triangular opening. This in turn is anastomosed to the LHV of the graft after applying stitches over three corners of the triangle to have a wide anastomosis with 5-0 continuous sutures. The anterior layer is completed using interrupted stitches. In case of a separate segment III vein opening into MHV and quite far from the segment II (LHV) opening, this is reconstructed directly to the cava using a ABO compatible preserved cadaveric iliac vein or PTFE (8mm).

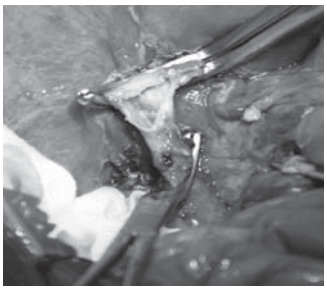


Figure showing the triangulation technique where all the hepatic veins orifices are connected to form a triangular opening.

Portal venous reconstructon:

This is one of the difficult reconstruction in pediatric recipients in view of the caliber mismatch as most of the biliary atresia children have hypoplastic portal vein and also the discrepancy in the location of graft hilum and the recipient vessels. Usually the bifurcation of the portal vein is used for the anastomosis to have wide diameter and enough length to fashion a tension free 'C' shaped anastomosis to the LPV of the graft. In case of significant (<4mm) hypoplastic portal vein with suboptimal flow, an interposition graft (preserved cadaveric iliac vein graft or internal jugular vein) is used for reconstruction from the splenic/superior mesenteric vein junction to the LPV of the graft, as most of these hypoplastic veins have a stricture along the mid portion of the main portal vein. The anastomosis is performed using 6-0 prolene continuous posterior and interrupted anterior sutures.

Figure showing a reconstructed portal vein in a left lateral segment graft with an cadaveric iliac vein as an interposition graft in a biliary atresia recipient with hypoplastic portal vein.

Hepatic artery reconstruction:

Technically it is same as the adult hepatic artery reconstruction except that recipient common hepatic artery is used for reconstruction after ligation of gastroduodenal artery to have size matching and optimal arterial flow.

Biliary reconstruction:

In small infants and children, Roux en Y cholangiojejunostomy is performed using 7-0 PDS interrupted sutures. In older children and non biliary atresia recipients, duct to duct anastomosis is attempted whenever possible.

The 2nd International Congress of

Living Donor Liver Transplantation Study Group

(ILDLT Study Group 2015)

대한간이식연구회

The Korean Liver Transplantation Society

Joint with the Korean Liver Transplantation Society

POSTERS

PP-1003

Analysis of early reoperation following living donor liver transplantation

Takanobu Hara, Akihiko Soyama, Masaaki Hidaka, Koji Natsuda, Tota Kugiyama, Hajime Imamura, Shinichiro Ono, Amane Kitasato, Tamotsu Kuroki, Susumu Eguchi
Nagasaki University Graduate School of Biomedical Sciences, Japan

INTRODUCTION: We retrospectively analyzed the causes, risk factors and impact on the survival rate of early reoperation after adult-to-adult living donor liver transplantation (LDLT).
METHOD: Adult recipients who underwent primary LDLT at our institute between August 1997 and August 2015 (n=198) were included in this study. Early reoperation was defined as surgical treatment within one month after LDLT.
RESULTS: Reoperation was performed 69 times in 54 recipients (a maximum of 4 times in one patient). The reasons for reoperation comprised postoperative bleeding (n=26), vascular complications (n=19), suspicion of abdominal sepsis or biliary leakage (n=17), early graft loss resulting in re-transplantation (n=2) and others (n=5). The short term survival rate in the reoperation group was significantly lower than that in the non-reoperation group (1-year: 88.6% vs 66.7%, $p<0.01$). The similar result was observed in the graft survival (1-year: 88.6% vs 66.2%, $p<0.01$). The outcome of the patients who underwent two or more reoperations was worse compared to the patients who underwent only one reoperation. In a subgroup analysis according to the cause of reoperation, the survival rate of the postoperative bleeding group was comparable with non-reoperation group ($p=0.25$). On the other hand, the survival rate of the vascular problem group and abdominal sepsis group were significantly worse. Multivariate analysis revealed that intraoperative blood loss ≥10 L (HR 2.12, 95%CI 1.08-4.18, $p=0.03$) and operative time ≥14 h (HR 1.99, 95%CI 1.02-3.89, $p=0.04$) were independent risk factors for early reoperation.
CONCLUSION: Early reoperation after LDLT was significantly associated with poorer outcome. However, the patient who underwent reoperation for postoperative bleeding showed comparable result to the patient who did not undergo reoperation.

PP-1004

Aspergillous osteomyelitis post liver transplantation

Rakesh Rai
Fortis Hospital, India

INTRODUCTION: Overall, invasive fungal infections affect 5-42% of liver transplant recipients with a mortality rate of 25-56%. Invasive aspergillosis is a relatively rare infection which affects 1-15% of solid organ transplant recipients and 1-9.2% of liver transplant recipients. Aspergillous osteomyelitis is rare.
METHOD: It is a case report of a male patient who underwent elective liver transplant for alcoholic cirrhosis and had uncomplicated recovery. He developed back pain 6 months post liver transplant and investigation by MRI revealed osteomyelitis of 2nd lumbar vertebra, right 8th rib and right claviculo acromial joint. Biopsy from the rib confirmed aspergillous osteomyelitis.
RESULTS: Patient was treated with 1 week of liposomal Amphotericin B followed by 6 months of voriconazole. patient pain completely resolved and a repeat MRI showed of complete resolution of osteolyelitis.There has been no recurrance of disease during follow up. It has been 2 years since the diagnosis. The liver graft is doing well.
CONCLUSION: Aspergillous osteomyelitis following liver transplant is rare. But as is clear from this report early diagnosis and proper management can provide a cure. The drug of choice at present is Voriconazole.

PP-1005

Denovo hepatocellular cancer following living donor liver transplant

Rakesh Rai
Fortis Hospital, India

INTRODUCTION: The cumulative risk for development of de novo malignancy after liver transplant is 1.6%, 2.7%, and 8.2% at 3, 5 and 10 years respectively. But denovo HCC in liver graft in a patient who has undergone liver transplantation for benign disease is very rare. There are less than 15 case reports of denovo HCC in patients following liver transplant.Usually denovo HCC is associated with recurrence of HBV and HCV in the graft leading to cirrhosis.

METHOD: We describe a case of development of denovo HCC following right lobe liver transplant in a patient with alcoholic cirrhosis who had no evidence of tumour before liver transplant.

RESULTS: Patient underwent an uncomplicated living donor liver transplant using right lobe graft without middle hepatic vein. Two and half years following liver transplant the patient developed severe back pain and hemoptysis. Liver function test was normal. PET Ct scan suggested multiple liver lesion, bony lesion and pulmonary nodules. Serum Alfa fetoprotein was raised. Biopsy of liver lesion confirmed it to be hepatocellular cancer. Patient was started on Sorafanib and received palliative radiotherapy to spinal metastasis for pain control.

CONCLUSION: Denovo HCC in liver graft is rare. It may develop in the graft without HCV or HBV infection and without changes of cirrhosis.

PP-1007

The possibility of radiotherapy as downstaging to living donor liver transplantation for hepatocellular carcinoma with portal vein tumor thrombus

Jin Yong Choi, C.H.D. Kwon, J.M. Kim, J.-W. Joh, G.S. Choi, S.H. Lee, W.-T. Cho, K.W. Lee, D.K. Oh
Samsung Medical Center, Korea

INTRODUCTION: Hepatocellular carcinoma (HCC) tends to be multifocality and vascular invasion, like portal vein (PVTT). These advanced HCC patients are excluded for liver transplantation (LT), according to Milan criteria. Traditionally radiation therapy (RT) was believed not effective for HCC but after developed conformer RT, there are several trial about RT as bridge to LT.

METHOD: This study took place between May 1996 and March 2013, total 1360 patients treated by LT in our institution and those of 5 recipients had RT because of PVTT. We analyze these patients retrospectively. To confirm the value of LDLT following RT in PVTT, we did matched study, according to sex, age, tumor size and number, dose of RT, level of AFP and location of PVTT.

RESULTS: In clinical characteristics of both groups and there is no statistically difference between both groups. All LT was done by LDLT with duct to duct anastomosis and mean operation times are 588 minutes. During follow-up periods, in LDLT following RT group, 2 recipients shown disease progression, but in RT alone group, all patients are shown tumor ingrowths or intra-, extra-hepatic metastasis. LDLT following RT group`s OS was 1055 days and that of RT alone group`s was 367 days and there was significant statistically difference.

CONCLUSION: LDLT following RT can be treatment of choice for PVTT in selective patients

PP-1008

Liver transplantation for biliary atresia: a nationwide investigation from 1996 to 2013 in mainland China

Ping Wan, Qigen Li, Jianjun Zhang, Qiang Xia
Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai, China

INTRODUCTION: Biliary atresia (BA) represents the most common indication for liver transplantation (LT) in childhood. We aim to analyze the overall profile and outcomes of LT for BA in mainland China using data from China Liver Transplant Registry (CLTR).

METHOD: A comprehensive investigation was performed in 509 children who underwent LT for BA between 1996 and 2013. As for survival analysis, the univariate analysis was used to evaluate 16 variables that might influence the graft survival (GS) after LT. Any variables identified as statistically significant in the univariate analysis were included in the multivariate Cox analysis.

RESULTS: Caseloads of LT for BA revealed a rapid annual increase in recent years with most transplants (358 cases, 70.3%) performed between January 2011 and December 2013. Cases from Shanghai (197 cases, 38.7%), Tianjin (143, 28.1%) and Beijing (81 cases, 15.9%) accounted for 82.7% of the entire series. Twenty-five centers had performed LT for children with BA, and center volumes ≥100, 50-99, 20-49, 5-19 and <5 were reported in 2, 0, 4, 4 and 15 centers, respectively. Grafts from living donors and deceased donors were used in 380 children (74.7%) and 129 children (25.3%), respectively. The 509 children had a median age of 9.6 months (range from 4.8 to 175.2 months). Their body weight ranged from 5.0 to 50.0kg (median: 8.0kg). Previous Kasai operation had been performed in 194 children (38.1%). One-, 3- and 5-year GS rates were 84.7%, 79.0% and 72.6%, respectively. Split grafts, center volume <20, graft-to-recipient weight ratio >4.0% and steroid-free immunosuppression regimen were independent predictors for poor GS outcomes.

CONCLUSION: In recent years, pediatric LT has been progressing immensely in mainland China, which enable more and more children with BA survive with LT. However, efforts should be directed to enhance the disease screening and early referral for Kasai operation in this group of patients.

PP-1009

Surgical planning for dual graft living donor liver transplantation using a right posterior sector and a left lobe: a case presentation

Qigen Li, Ping Wan, Jianjun Zhang, Ming Zhang, Xiaosong Chen, Lei Xia, Tianyu Xing, Longzhi Han, Qiang Xia
Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai, China

INTRODUCTION: Living donor liver transplantation (LDLT) using dual grafts was introduced to overcome the inadequacy of graft size from a single donor. We herein present a case who underwent dual graft LDLT using a right posterior sector (RPS) plus a left lobe (LL).

METHOD: The patient was a 45-year-old man (165cm/60kg) with hepatitis B-related liver cirrhosis. He was diagnosed as fulminant liver failure and hepatorenal syndrome with a model of end-stage liver disease score of 36. The graft volume for LDLT should be 470cm3 at least (40% standard liver volume).

RESULTS: His brother (donor 1, 168cm/55kg) and his sister (donor 2, 162cm/45kg) were both eligible as potential donors. However, volumetric analyses showed that neither of the 2 donors was suitable for donation due to the volume disproportion between the right and left lobes (778.4cm3 and 205.6cm3 for donor 1; 677.4cm3 and 204.6cm3 for donor 2). LDLT using dual left lobes also could not provide the recipient with adequate graft volume. However, donor 1's RPS portal vein was branching off separately from the main portal vein, and his RPS bile duct was going directly into the common hepatic duct. The estimated RPS volume

of donor 1 was 385.4cm3. Thus, we harvested the RPS from donor 1 and the LL (without middle hepatic vein) from donor 2 and implanted them as dual grafts on July 25, 2014. The actual weights of the RPS graft and the LL graft were 295g and 195g, respectively. After transplantation, both grafts were working well. The recipient has now been followed up for 11 months.

CONCLUSION: The RPS graft could be a good option for dual graft LDLT if livers of two donors both demonstrate a disproportionately small left lobe. However, volumetric and anatomical assessment of the donor liver should be accurately conducted for RPS procurement.

PP-1011

Outcome of rituximab-based desensitization protocol without local infusion therapy for ABO incompatible living donor liver transplantation at single center experience

Takahiro Murokawa[1], Kwang-Woong Lee[2],
Sai Aung Nyunt Oo[2], Yermakhan Hanuly[2], Hyeyoung Kim[2],
Nam-Joon Yi[2], Kyung-Suk Suh[2]
[1]*Kumamoto University Hospital, Japan*
[2]*Seoul National University College of Medicine, Korea*

INTRODUCTION: To evaluate feasibility of Rituximab (Rit) based desensitization protocol without local infusion (LI) for ABO- incompatible (ABO-i) Living donor liver transplantation (LDLT).

METHOD: Between March 2012 and August 2015, 33 cases (11.7%) of ABO-i adult LDLT were performed. The median age and MELD score of the recipient was 54 (37-74) and 14 (6-54), respectively. The median age of the donor and GRWR were 35 (17-58) and 1.22 (0.76 -1.87), respectively. Most were given Rit (300mg/m^2) around 3 weeks (4-33days) before LDLT, followed by plasma exchange (PE) targeting isoagulutinin (IsoA) titer less than x16. The median time of PE was 3 (1-15). The median preoperative CD19 accounted for 0.28%. Synchronous splenectomy with perioperative intravenous immunoglobulin (0.8g/Kg) was selectively added (27%) according to IsoA titer levels. The immunosuppressive regimen was initialized with Tacrolimus, Steroids and Mycophenolate Mofetil. We retrospectively reviewed the outcomes and complications.

RESULTS: One patient was excluded from this study because of early in-hospital death. The median follow-up period was 15.2 month (0.5-41.2). The 1- and 3- year graft/patient survival rate were 100/100% and 75.5/85.0%, respectively. We lost two patients due to chronic rejection and cancer-related death. One patient underwent re-liver transplantation from cadaveric donor for intractable hyper bilirubinemia even after proper biliary intervention.

There was no acute antibody mediated rejection such as hepatic necrosis and intrahepatic biliary stricture. One early and one late portal vein thrombosis were observed. Five patients (16.1%) experienced anastomotic biliary stricture, requiring intervention. There was one case of late onset acute rejection, followed by chronic rejection. One patient developed sepsis, two experienced pneumonia and three contracted CMV infection requiring antiviral therapy, albeit all not life- threatening.

CONCLUSION: So-called ABO-i related mortality and morbidity have not been seen in our series. Our Rit-based protocol without LI for ABO-i LDLT was feasible with acceptable outcome.

PP-1012

Biliary anastomosis complications after living donor liver transplantation in Mongolia

Bat-Ireedui Badarch[1], Ganzorig Batjargal[1], Sergelen Orgoi[2]
[1]*First Central Hospital of Mongolia, Mongolia*
[2]*Mongolian National University of Medical Sciences, Mongolia*

INTRODUCTION: The shortage of available liver donor is the major limiting factor in liver transplantation. Therefore transplant physicians and surgeons suggest to only some LT required patients.

The mortality in awaiting patients of LT decreased after the Model for End-Stage Liver Disease (MELD) system was implemented. 10% of patients dying while waiting time for LT. Since the major benefit of LDLT is to reduce waiting time mortality and shortage of donor liver.

METHOD: 20 patients underwent LDLT at First Central Hospital of Mongolia. We compared our LT result with 59 cases that underwent LDLT at Asan Medical Center, South Korea and biliary reconstruction complications were analyzed during 46 months. This research analyzed the incidence of biliary anastomosis complications, risk factor and management of biliary complications.

RESULTS: The present study examined BC incidence, risk factors and management using two-center, first data from 259 adult patients (225 right liver and 34 left liver grafts) between 2000 and 2002 in Asan Medical Center, second data from 20 adult and pediatric patients (18 right liver and 2 left liver graft) between 2011 and 2015 First Central Hospital of Mongolia.

CONCLUSION: We found that most BC could be successfully controlled using radiological intervention. In terms of anastomotic stenosis risk, HJ appears a better choice than DD for right liver grafts involving ducts less than 4 mm in diameter

PP-1013

Prospective pilot study of living donor liver transplantation for patients with HCC exceeding Milan criteria

Mihai-Calin Pavel[1], Jordi Rimola[2], Maria Alba Diaz[3], Jordi Colmenero[3], Constantino Fondevila[1], Josep Fuster[1]
[1]Hospital Clinic of Barcelona, Spain
[2]Universitat de Barcelona, Barcelona, Catalonia, Spain., Spain
[3]Hospital Clínic, University of Barcelona, Spain

INTRODUCTION: During recent years it became apparent that a subset of patients with hepatocellular carcinoma beyond Milan criteria might obtain acceptable survival outcomes after liver transplantation. In parallel, living donor liver transplantation has emerged as a feasible alternative to overcome the paucity of donors

METHOD: In 2002, we proposed for living donor liver transplantation in Child A-B patients with hepatocellular carcinoma a set of criteria that substantially expanded the conventional indications of transplantation (1 tumor < 7cm, 5 tumors < 3cm, 3 tumors < 5cm, downstaging to Milan lasting 6 months after loco-regional therapies)

RESULTS: We present a prospective cohort of 22 patients with hepatocellular carcinoma fulfilling these criteria treated with living donor liver transplantation between 2002 and 2014. The median age was 57 years old, 20 men, Child-Pugh A:16, B:6, AFP <100ng/mL: 21. Twelve patients received loco-regional therapies. At the time of transplantation, 10 cases presented downstaging and 12 were beyond the Milan criteria. Pathological reports showed that 54% exceeded our selection of expanded criteria. Perioperative mortality was 0%. After a median follow up of 78 months, the 1-, 3-, 5- and 10-year survival was 95%, 84%, 77% and 69%, respectively. Overall, four patients recurred (range 9-108 mo), and the 5-y and 10-yr actuarial recurrence rate was of 13% and 25%, respectively.

CONCLUSION: A proper selection of candidates forextended indications of living donor liver transplantation of hepatocellular carcinoma patients may provide

PP-1014

Segment 4b and segment 8 liver resection

Muhammad Wahla
Mansoorah Hospital, Pakistan

INTRODUCTION: The eight anatomic segments of the liver are defined by the distribution of the hepatic and portal venous systems. Each liver segment has an independent biliary drainage and vascular inflow and outflow. Consequently, it is possible to remove an individual segment

without disrupting the blood flow or biliary drainage of the remaining segments. Based on the Brisbane 2000 Terminology of Hepatic Anatomy and Resection the liver can be divided into four sections. In our case, liver cancer was in the region of two different segments.

METHOD: This was a 53 years old male patient who had history of Hepatitis C treated with interferon for 48 weeks. He was under regular follow up when on ultrasound liver tumor was found. There was no history of pain, abdomen, weight loss, vomiting and jaundice. CT Scan results were some early enhancing liver nodular mass in segment 4-8 about 4.5 cm in size with early wash out. Resection of segment 4 and segment 8 was done. There was uneventful recovery.

RESULTS: With the good knowledge of liver anatomy, It is possible to perform some isolated segmental liver resection. It is more difficult when cancer is at the junction of two segments and both segments are not in the same line.

CONCLUSION: Most of the time we do resection of Right or left lobe of liver but in some tricky cases when patient is already cirrhotic and liver tumor are more than one and scattered or they are at the junctions of two segment who are not in the same plane then resection is somewhat difficult. But many times we achieve the target successfully. A big advantage of these types of resections is that we can save liver parenchyma especially in cirrhotic patients. More research in this topic is highly recommended.

PP-1016

Alveolar hemorrhage in pneumonia after liver transplantation

Adianto Nugroho, Kwang-Woong Lee
Seoul National Hospital, Korea

INTRODUCTION: Despite advances in perioperative management, post-operative pulmonary complication remains a challenge after liver transplantation. Both infectious and non-infectious causes, either alone or in combination, may evolve into multisystem organ failure with high morbidity and mortality. Alveolar hemorrhage is a life threatening clinical syndrome, which often initially suspected as atypical pneumonia. Association with hematopoietic stem cell transplantation is well studied, but not with solid organ transplantation.

METHOD: We report a case of alveolar hemorrhage in liver transplant recipient complicated with pulmonary infections

RESULTS: A 54-year-old female presented with fever and shortness of breath on the 3rdpost-transplant day after deceased donor liver transplantation. Imaging studies showed a diffuse bilateral pulmonary infiltrates and a positive sequential BAL test was revealed during bronchoscopy. CMV–Ag was 8/200,000 WBC, Aspergillus Galactomannan and P. jerovicii was also positive. However, only Aspergillus hyphae was found in the sputum culture. Management strategy was aimed to (1) treat the underlying infections, (2) provide an adequate respiratory support and (3) inflammation control through a balance use of steroid and other immunosuppression agents. After a long period of difficult weaning from ventilator, tracheostomy was done, and gradually recovered.

CONCLUSION: In conclusion, DAH should be considered in the differential diagnosis in early pulmonary complications after liver transplantation with regards to the history of Autoimmune disease, restrictive mechanical pulmonary condition and the presence of infection. Early diagnosis and aggressive treatment protocol is the key for a good outcome

PP-1017

Outcome of living donor liver transplantation using partial liver allografts with multiple arterial supply

Kyo Won Lee, Choon Hyuck David Kwon, Chan Woo Cho, Nuri Lee, Dong Kyu Oh, Byung Gon Na, Jin Yong Choi, Wontae Cho, Gyu Seong Choi, Jae-Won Joh
Samsung Medical Center, Korea

INTRODUCTION: When multiple donor hepatic arteries (HA) are present in living donor liver transplantation (LDLT), whether all HAs require reconstruction remains debatable. In this study, we compared outcomes of liver transplantation according to the number of hepatic artery anastomosis.

METHOD: *From Jan 2000 to June 2014, 990 cases of LDLT were performed at Samsung Medical Center (Seoul, Korea). We excluded ABO incompatible cases, retransplantation cases and Lt lobe graft cases from the analysis. Data of 906 cases using right lobe (RL) were retrospectively reviewed. Our center's criteria for HA anastomosis in case of multiple HAs is to check for pulsatile back-flow from the smaller HA during the donor procedure and also during the recipient procedure. A priority is set on anastomosis of both HAs, unless good pulsatile back-flow is evident during both the donor and the recipient procedures.*

RESULTS: Out of the 906 cases, 30 cases (30/906, 3.3%) were done using liver allografts with multiple HAs. Among the 30, we anastomosed both HAs in 19 cases and one HA in 11 cases. The two groups did not show differences in donor and recipient age, GRWR, cold ischemia time, macro- and microscopic steatosis of the graft, type of bile duct anastomosis and number of bile duct anastomoses. Postoperative results showed similar levels of maximum AST and ALT during the 1st post-transplant week. Rate of biliary complications were not different between the two groups. One case of HA thrombosis occurred (both HAs anastomosis group).

CONCLUSION: Using our criteria for HA anastomosis, we were able to achieve similar outcomes among LDLT cases using allografts with two HAs.

PP-1018

Total internal biliary diversion during living donor liver transplantation for paediatric progressive familial intrahepatic cholestasis type 1: A unique approach using the caudal end of the roux-en-Y jejunum

Vidyadhar Mali, Takanobu Shigeta, Akinari Fukuda, Hiroyuki Kanazawa, Rahayatri Trihening, Kengo Sasaki, Yoshihiro Hirata, Hajime Uchida, Mureo Kasahara
National Centre for Child Health and Development, Japan

INTRODUCTION: Progressive familial intrahepatic cholestasis type 1 (PFIC 1) is an autosomal recessive cholestatic disorder of infancy and early childhood. Liver transplantation (LT) is indicated for biliary cirrhosis, severe intractable pruritis or growth retardation. However, interruption of the normal entero-hepatic circulation is necessary to prevent post-operative graft steatosis and recurrent liver disease as the gene defect is also expressed in the small intestine.

METHOD: A 2 year 4 month old female with genetically confirmed PFIC 1 and jaundice, pale stools, pruritis and diarrhoea underwent LT using a left lateral segment graft from the heterozygous father. A 35 cm roux loop of jejunum (35 cm from the duodeno-jejunal flexure) was used for biliary reconstruction with the graft hepatic duct over an interno-external drain. The caudal end of the roux limb was anastomosed to the mid-transverse colon with special care to create an intussuscepted anti-reflux valve. Oral metronidazole was administered for post-operative prophylaxis of ascending cholangitis and enterocolitis.

RESULTS: Biliary secretions were observed from the time of reperfusion.Stools became pigmented.Radio-isotope scintigraphy (day 27) confirmed free biliary drainage from the liver into the colon with t ½ of 34 minutes. The ileocaecal valve was noted to be competent. At 40 days after LT, jaundice, pruritis and diarrhoea have resolved, liver enzymes have normalised and there is no ultrasound evidence of biliary dilatation. Long-term follow-up will reveal the risk of ascending cholangitis and the occurrence of bile-acid induced histological alterations in the colon. Surveillance with regular colonoscopies, carcinoembryonic antigen levels and faecal occult blood tests is necessary.

CONCLUSION: Simultaneous total internal biliary diversion using a roux-en-Y hepaticojejunocolonic conduit during LT offers a clinically effective stoma-free procedure with only one additional anastomosis in the management of PFIC 1.

PP-1019

Donor age over than 55 years old in living donor liver transplantation

SeungHwan Lee, Wontae Cho, Jinyoung Choi, Kyo Won Lee, Byunggon Na, Donggyu Oh, Gyuseong Choi, Choon Hyuck David Kwon, Jae-Won Joh
Samsung Medical Center, Korea

INTRODUCTION: The significance of donor age in living donor liver transplantation (LDLT) has not been fully evaluated, present study was to evaluate the influence of donor age on graft function and outcomes in recipients and donors.

METHOD: We included 93 adult recipients who underwent LDLT from May 1996 to September 2013.

According to the age of donor, recipients were divided into two groups: older >55 years of age and younger ≤55 years of age.

For each patient with older donor graft (donor age >55), a patient with younger donor graft (donor age ≤55) matched by Graft to Recipient body weight ratio, Child-Pugh class, Model for end stage Liver disease score and existing of hepatocellular carcinoma was selected.

We collected retrospectively patient datas.

RESULTS: Baseline characteristics were not different between the two groups, except for more number of male donors in the younger group. The frequencies of allograft rejection, Biliary complication, vascular complication and laboratory results of recipients after transplantation were similar in the two groups.

Hospital stay and post operation complications of the older donor group were not significantly higher than those of the younger donor group (P=0.27 and P=1.00, respectively).

Macrosteatosis in the older age group of donor is significantly higher than in the younger age group (11.35%±9.91 vs. 7.35%±8.2, P=0.04). But both group had the macrosteatosis rate of less than 30. There was no significant differences in mortality within 60 days after LDLT between 2 groups (4.8% vs 6.5%, P=1.00).

The cumulative 2-year survival rates were 80.9% in younger age group and 75.4% in older group of donor without substantial difference (P=0.279).

CONCLUSION: The surgical outcomes of recipient using older donor livers were comparable to those using younger donor livers for LDLT and safety of the donor over the age of 55 is similar to the donor of 55 years old or less.

PP-1020

Living donor liver transplantation across ABO blood group barrier in infantile end-stage liver diseases

Qiu Bi Jun, Liu Yuan, Shen Cong Huan, Luo Yi, Zhou Tao, Zhang Ming, Han Long Zhi, Sha Meng, Zhang Jian Jun, Xia Qiang
Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong University, China

INTRODUCTION: In China, most infantile liver transplantations have been performed using living donors because of the severe shortage of cadaveric organ donors. Living donor liver transplantation must be confined to recipients' immediate relatives within three generations. Therefore, the ABO blood type incompatible LDLT was common and need to be investigated in practice

METHOD: Retrospective analysis was conducted in 440 pediatric liver transplantation performed in our center from Oct 2006 to July 2015. Among them 12 infantile ABOI LDLT were performed using donors'left lateral lobe liver. No special treatment aiming at Lower blood group antigen titer was applied in perioperative management. Liver function, IgM antibody titer against the ABO blood type antigen, CNI blood concentration and graft Dopplar ultrasound tests were regularly monitored perioperatively

RESULTS: All of 12 patient survived including one patient who received retransplantation 1 year after the first operation. Before the operation, 2nd Patient had the highest anti-A/anti-B titer, which was 1:128/1:64, while other patients had the titer of 1:8/1:16 or 1:16/1:8 at most. Accordingly,

the mean level of total bilirubin in 11 patients except 2nd Patient was reduced to 11.7umol/l[range 3.8-17], with the pre-operation mean level of 330.4[range 82-468]. On the other hand, 2nd Patient encountered a re-increase of bilirubin after 2 weeks of falling and kept at a high plateau for a long time.

CONCLUSION: ABOI LDLT is a safe and effective method in treating infantile end-staged liver disease. Preoperative antibody titer against donor blood type antigen is a key factor which could affect the patients prognosis. In most infants preoperative antibody titer against donor blood type antigen is very low, which means it is unnecessary to decrease the antibody titer before the ABOi liver transplantation. However, few infants with relatively high level of antibody titer need special treatment to decrease the level of antibody titer.

PP-1021

Impact of intraoperative blood transfusion on long-term outcomes of liver transplantation for hepatocellular carcinoma

SL Sin, WC Dai, KSH Chok, ACY Chan, W Sharr, TT Cheung, James Fung, TCL Wong, SC Chan, CM Lo
The University of Hong Kong, Hong Kong, China

INTRODUCTION: To investigate the impact of intraoperative blood transfusion on the long-term outcomes of liver transplantation for hepatocellular carcinoma.

METHOD: Adult patients who had non-salvage liver transplantation at our center between January 2005 and December 2012 for hepatocellular carcinomas that were within the UCSF criteria and could not be resected or ablated were divided into groups with and without intraoperative blood transfusion. Comparisons were made between groups.

RESULTS: Ninety-nine patients were included in the study. Sixty-two (62.6%) patients received intraoperative blood transfusion. Patients without transfusion were younger (54 vs. 56 years; p=0.04) and had a lower Model of End-stage Liver Disease score (11 vs. 14; p<0.001). More of them had stage-1 tumors (64.9% vs. 37.1%; p=0.007) and fewer of them had postoperative complications of grade IIIA or above in the Clavien-Dino classification (21.6% vs. 48.4%; p=0.008). The groups were comparable in hospital mortality (3.2% vs. 2.7%; p=1.00), 5-year overall survival (90.8% vs. 89.2%; p=0.611), and 5-year disease-free survival (90.5% vs. 89.2%; p=0.835). On multivariate analysis, postoperative complications of grade IIIA or above were associated with worse survival (hazard ratio 7.108; 95% confidence interval 1.455-34.712; p=0.015).

CONCLUSION: Intraoperative blood transfusion was shown to have no significant impact on the long-term outcomes of liver transplantation for hepatocellular carcinoma, whereas postoperative complications of grade IIIA or above were associated with worse recipient survival.

PP-1022

ABO incompatible living donor liver transplantation: two cases report

Guoyong Chen, Sidong Wei, Jianjun Sun, Gaofeng Tang, Jianbin Chen, Huibo Zhao, Zhantao Xie, Huaen Xu, Jinfa Jiang
People's Hospital of Zhengzhou, China

INTRODUCTION: ABO incompatible living donor liver transplantation (ABO-i LDLT) has a risk of antibody-mediated rejection (AMR) leading to graft loss. Recently, AMR has been prevented by reducing ABO antibodies and using strong immunosuppression to improve the outcome in many transplantation centers. Herein we describe two cases of ABO-i LDLT that is the first report of adult ABO-i LDLT in china to our knowledge.

METHOD: A 31-year-old female who suffered liver function failure with cirrhosis due to autoimmune hepatitis and a 43-year-old male who suffered liver cirrhosis with hepatocellular carcinoma (HCC) due to viral hepatitis type B were performed ABO-i LDLT in our hospital at 9 May

2015 and 10 June 2015. She with blood type "O" and he with blood type "A" received a blood type "B" left lateral and a blood type "AB" right lateral segment liver graft respectively. Intraoperative splenectomy was performed in the recipients. Although the anti-B titers of the recipients all were 1:8 preoperative, a slight "B" type plasma was infused every day for her hypoproteinemia and disorder coagulation from 20 days before operation. Plasma (B for her and AB for him) was infused intraoperative and postoperative, and the anti-B titers were lower than 1:16 within 1 month after ABO-i LDLT. The immunosuppressive regimen included intraoperative induction with basiliximab (20mg) and methylprednisolone (500mg) and subsequent immunosuppressive therapy with tacralimus, mycophenolate mofetil and corticosteroids.

RESULTS: After ABO-i LDLT, the patients achieved normal graft function without evidence of AMR. Ten days after transplantation, she suffered pulmonary infection of staphylococcus aureus and klebsiella pneumonia, and then recovered completely at day 14 after antibiotic admission.

CONCLUSION: ABO-i LDLT might be a life-saving opportunity for patients with liver function failure or HCC when ABO compatible donors are not available for LDLT.

PP-1023

Our experience in liver transplantation

Daniyar Toksanbayev, Nariman Sadykov, Maxat Doskhanov, Shokan Kaniev
Syzganov's National Scientific Center of Surgery, Kazakhstan

INTRODUCTION: Since December 2011, we have performed 26 liver transplantations. 20 cases done from living donors, another 6 – from cadaveric donors.Ethiology of end stage liver disease was: 18 patients (69.2%) have had liver cirrhosis caused by viral hepatitis; other cases distributed between autoimmune hepatitis (15.4%), primary biliary cirrhosis (3.8%), secondary biliary cirrhosis founded on congenital biliary atresia (3.8%), cryptogenic liver cirrhosis (3.8%). The patients' age ranged from 16 to 57 years. MELD score ranged from 13 to 25.

METHOD: Donors in LDLT surgery. Extended left lobe for grafting was preferred in 6 cases (30%); right lobe (50%) – in 13 cases and 1 case (20%) – the right posterior lateral sector of the liver. Duration of donor's surgery was between 5 hours 10 minutes and 8 hours and 15 min. The most significant intraoperative blood loss was 1350 ml. All donors for today are leading normal life style.

Recipients. Six patients from twelve died in early stage after LT (POD 1-10), in different reasons but generally because of hepatic failure, and another one patient – 7 month after LT because of lungs infection. All survived recipients had no any significant complications. There were no any deaths of recipients after DDLT operations.

RESULTS: For today, the greatest period of follow-up of patients after LT is 41 months. Of the 26 operated recipients, 19 (73.1%) lead a normal lifestyle, receiving a minimal immunosuppressive therapy. In patients with cirrhosis of viral etiology, there are no cases of viral hepatitis reinfection

CONCLUSION: The development of living donor liver transplantation programme in the Republic of Kazakhstan looks a good option; however, cadaveric donor transplantation programme is preferable for developing, because of high risk of complications in donor' surgery.

PP-1024

De novo malignancy within one year after LDLT ; Case report

Joo Kim, Doo Kim, Jang Jeon, Tae Yoo
Hallym University Gangdong Medical Center, Korea

INTRODUCTION: Biliary obstruction is a commonafter LT. The anastomotic failure of biliary reconstruction is the leading cause. When the patient with HCC underwent liver trasplantation and developed a jaundice, the recurrence of HCC is suggested as the main cause. Here we describes a

case of biliary obstruction due to pancreatic head cancer at 11 months after LDLT.

METHOD: The patient was a 54-year-old male with HBV - cirrhosis andHCC within Milan criteria. He previously underwent liver resection for HCC two times. Recurrence of HCC revealed and LDLT using the right lobe from his 23-year-old daughter was performed. He discharged on postoperative 28th day with uncomplicated course.

RESULTS: At eleven months after operation, the patient showed icterus. Ampullary stricture below the anastomosis site was found by MRCP and finally diagnosed in adenocarcinoma with endoscopic biopsy. Pylorus-preserving pancreaticoduodenectomy (PPPD) was performed for complete resection of pancreatic head cancer on 14 months after LDLT. The patient revealedsuperior mesenteric arterial (SMA) pseudoaneurysmal bleeding controlled by endovascular graft postoperatively. However, the patient died from recurred pancreatic head cancer two year after LDLT.

CONCLUSION: Our experience suggest that high suspicion of de novo malignancy is needed for the patient with HCC who has undergone liver transplantation.

PP-1025

Pediatric hepatocellular carcinoma-outcomes

Kumar Palaniappan, Sanjay Govil, Naresh Shanmugam, Mohamed Rela
Global Health City, India

INTRODUCTION: Hepatocellular carcinoma (HCC) is the second most common malignant liver tumour of childhood. It typically affects children with a median age of 10-14 years on background Hepatitis B related liver disease and is often metastatic or locally advanced at diagnosis. Children below the age of 5 years typically constitute less than 10% of all children with HCC and occur on a background of congenital or metabolic liver disease.

METHOD: The medical records of all children (< 18 years) with HCC who presented to our department over a 6-year study from 2009-2015 period were reviewed.

RESULTS: Twelve patients with a median age of 6 years (range 1.9years -15.4 years) were diagnosed to have HCC. All patients underwent liver transplantation; none were resected. Eleven patients had background congenital or metabolic liver disease. All 5 of those with Hereditary Tyrosinemia Type 1 had HCC at diagnosis. Three patients had, pre transplant TACE. No patient had Hepatitis B related liver (HBV) disease. Eight (66.7%) patients had incidentally discovered HCC on examination of the explant. Incidentally discovered HCC were smaller, well differentiated and did not show microvascular invasion compared to those diagnosed preoperatively. There was no recurrence with a median follow-up of 12 months.

CONCLUSION: The patient demographic for pediatric HCC is changing probably as a consequence of successful immunization against HBV. Younger patients with congenital and metabolic liver disease in whom liver transplantation is the ideal treatment are likely to constitute an ever-increasing proportion of patients with pediatric HCC as HBV disease is controlled or eradicated.

PP-1026

Rejection crisis after liver transplantation

Shokan Kaniyev, Daniyar Toksanbayev, Nariman Sadykov
Kazakhstan

INTRODUCTION: The aim of the current study is to improve the long-term results of liver transplantation.

METHOD: Since December 2011, in Syzganov's National Scientific Center of Surgery performed 31 liver transplantations. Among them, there were 22 (70.1%) living donor liver transplantations and 8 (29.9%) cadaveric donor liver transplantation, including one cadaveric donor liver re-transplantation. The age of recipients was between 16 and 57 years old, 10 males and 20 females, with Child-Turcotte-Pugh scores matched for B and C classes, MELD

score ranged between 12 and 27. In 26 cases, donor's and recipient's blood types were identical, in another 5 – compatible ones.

Two-component immunosuppressive therapy (Tacrolimus and steroids) carried out in 9 patients, tree-component therapy with Basiliximab for induction (Tacrolimus and Mycophenolate mofetil and steroids) – in another 21 patients.

RESULTS: Four patients had a rejection crisis in early post-transplant period (till 3 months). Three of these patients had a cellular rejection of the mild degree, another one – a humoral rejection of the severe degree, in approval by the morphological investigation.

Three patients had a cellular rejection in long-term period (more than 3 months). Rejection in two of these cases was the result of reduction of immunosuppressive therapy dosage, and another one case was associated with the cancellation of immunosuppressive therapy because of the septic status of the patient.

The treatment of rejection crisis was successful in 6 patients with the complete recovering of the liver function. One patient developed a bilateral pneumonia after pulse therapy and finally died due to sepsis.

CONCLUSION: Immunosuppressive therapy is a corner stone of determinant factors for the survival of recipients after liver transplantation. In treatment of the rejection crisis, the approach should be individual for each patient, for the purpose of prophylaxis of infectious complications.

PP-1028

The benefit of dual tracer 11C-acetate and 18F-FDG PET CT as part of routine work up in living related liver transplant- A single Center Experience

Tan To Cheung, See Ching Chan, Siu Ho Chok, Albert Chan, Chung Mau Lo

The University of Hong Kong, Queen Mary Hospital, Hong Kong, China

INTRODUCTION: All of the liver transplantation criteria for HCC depend heavily on tumour size and numbers. However, the sensitivity of contrast CT scan and MRI is far from satisfactory.

METHOD: Data of 100 HCC patients having the dual-tracer PET CT between January 2004 and October 2013 were reviewed. 54 underwent live donor liver transplantation. Results of HCC staging evaluated by dual-tracer PET with contrast CT were compared with pathological results.

RESULTS: Total 101 tumours were identified among the 54 patients. The median tumour number were 1 (1-4) and the median size (cm) was 3.5 (0.9-8.0). For tumour range from 1-2cm, the sensitivity by contrast CT alone, by FDG alone, by C acetate alone and by overall combination of 3 assessment was 7/16 (43.8%), 1/16 (6.3%), 9/16 (56.3%) and 11/16 (68.8%) respectively (p=0.003). For tumour >2cm the sensitivity by contrast CT alone, by FDG alone, by C acetate alone and by overall combination of 3 assessment was 25/37 (67.6%), 11/37 (29.7%), 28/37 (75.7%) and 32/37 (86.5%) respectively (p<0.0001).

Among the study patients, 36 (67.9%) had no FDG uptake and 17 (32.1%) had FDG uptake. The 1-year, 3-year and 5-year overall survival rates for those without FDG uptake versus those with FDG uptake are 100%, 100% & 100% and 92.9%, 76% & 76% respectively (P=0.008).

CONCLUSION: From this study Dual-tracer PET with contrast CT probably provided the best pathological prediction of explants pathology in patients with HCC up to date due to the acetate tracer. The FDG tracer provide a very good correlation to the survival after transplant for patients with HCC.

PP-1029

The role of curative intent surgical resection for the recurrent HCC

Seung Hwan Song, Juhan Lee, Jae Geun Lee, Myoung Soo Kim, Gi Hong Choi, Jin Sub Choi, Soon Il Kim, Dai Hoon Han, Dong Jin Joo

Severance Hospital, Korea

INTRODUCTION: Liver transplantation (LT) is one of the best treatment for hepatocellular carcinoma. However, there could be HCC recurrence in around 10-20% of the transplant patients. The Recurrent Hapatocellular carcinoma (HCC) after liver transplantation remains one of the major causes to graft failure and patient death. Because HCC recurrence is known for systemic disease, systemic therapy may be considered. However the optimal treatment of recurrent HCC is not established.

METHOD: A total 292 recipients with HCC who underwent liver transplantation between January 2007 and April 2015 in Severance hospital were retrospectively reviewed. Among 292 patients, 41 patients developed hepatic or extra-hepatic recurrent HCC. We compared the outcomes of the recurred patients according to the therapeutic approaches.

RESULTS: The mean age of the HCC recurrence group was younger than non-recurrence group (p<0.003). There was no significant difference of the etiology of HCC between the groups. The patients above Milan criteria showed a higher tumor recurrence rate than those within Milan criteria (Odd ratio 4.717, p<0.001). The curative intent surgical therapy was performed in 13 patients. Among them, resection only in 2, adjuvant chemotherapy after resection in 4, adjuvant radiation therapy (RT) in 4, adjuvant transarterial chemoembolization (TACE) and chemotherapy in 2, and adjuvant TACE and RT in 1. The palliative therapy was consisted of TACE, chemotherapy, or RT. Among the patients received curative intent surgical therapy, 3 patients had intrahepatic recurrence and 10 patients had extrahepatic recurrence.The 5 year graft survival was higher in curative intent surgical therapy group than in palliative therapy group (51.1% vs 306%, P=0. 026).

CONCLUSION: The curative intent surgical therapy showed the superior graft survival than palliative therapy. The curative intent surgical therapy is not applicable in every recurrent case. However the patient received curative intent therapy if possible, it is increased with the graft survival significantly.

PP-1030

Biliary complication after living donor liver transplantation according to biliary reconstruction methods

Jae Geun Lee[1], Juhan Lee[1], Jung Jun Lee[2],
Seung Hwan Song[1], Man Ki Ju[1], Man Ki Ju[1], Myoung Soo Kim[1], Jin Sub Choi[1], Soon Il Kim[1], Dong Jin Joo[1]
[1]*Yonsei University College of Medicine, Korea*
[2]*Cha University of Medicine and Science, Korea*

INTRODUCTION: Despite improvement of operative techniques and long term outcomes, biliary complication remains as a severe obstacle in living donor liver transplantation. The aim of study was to know biliary complication after living donor liver transplantation according to biliary reconstruction methods.

METHOD: Medical records of 245 adult liver recipients who underwent living donor liver transplantation between September 2005 and December 2013 were retrospectively reviewed. Biliary complications according to the biliary reconstruction methods were analyzed. Biliary reconstruction types were Roux-en-Y hepaticojejunostomy (RYHJ), single duct-to-duct (SDD) anastomosis and multiple duct to duct anastomosis (MDD) including two bile duct to one bile duct, separated two bile duct, made one to one and triples.

RESULTS: Of the 245 recipients, 90 (36.7%) patients had biliary complications including anastomotic bile leakages (n=12), non-anastomotic bile leakages (n=4), anastomotic biliary stricture (n=66), non-anastomotic biliary stricture (n=4). The incidences of anastomotic biliary complications were 0% in RYHJ group, 31% in SDD group and 42.9% in MDD group. (p=0.030). In subgroup analysis, however, if graft liver containing multiple bile duct orifices, there was no significant difference of biliary complication rate between RYHJ group and MDD group. (p=.503). One patient underwent exploratory laparotomy because of internal herniation in RYHJ group

CONCLUSION: RYHJ had lower biliary complication rate than

duct to duct anastomosis in this study. When the orifice of bile duct was more than 2, however, biliary complication rate of RYHJ was not significantly lower than that of duct to duct (multiple). Time consuming on procedure, non-physiologic passage, source of an ascending infection and internal herniation of RYHJ should be considered.

PP-1031

Posthepatectomy liver failure: Impact of Glissonean pedicle transection method. Single institution experience

Enkhamgalan Tsiiregzen
United Family Intermed Hospital, Mongolia

INTRODUCTION: Aim of study: To determine surgical outcome of Post hepatectomy liver failure (PHLF) using ISGLS's grading system.
METHOD: Method of study: We retrospectively reviewed all surgical charts of liver resection cases between 2008 and 2013 from HPB Surgery Department, NCC of Mongolia. Surgical outcome of Glissonean pedicle transection approach was compared with Classical approach for major hepatic resection cases. Small liver resections were excluded from the study. ISGLS grading system from 2010 was used for the first time. Data analysis was made using SPSS 20.0 programm.
RESULTS: RESULTS: 864 consecutive cases were identified. Right Hepatectomies-198 (Glissonean pedicle transection-117, Conventional approach-87), Left Hepatectomies-87, Anterior resections-38, Posterior resections-51, Central Bisectionectomies-22 and limited liver resections-468.
Since introduction of Glissonean pedicle transection approach Grade C PHLF decreased from 7.3% to 4,2%, Grade A PHLF increased from 2,4% to 16.3%, non-PHLF was increased from 8.9% to 21%, instead Grad B PHLF has no significant change over time. Overall mortality was 3.7%. Grade C PHLF group has significantly higher mortality rate of about 70%.
In case of Right hepatectomy group, Grade C PHLF decreased from 31.81% to 12.69%, Grade A PHLF increased from 4.5% to 34.2%, instead both non-PHLF and Grad B PHLF have no significant change over time. Glissonean pedicle approach has shorter operating time (mean= 247.11 min, standard deviation +/- 72.41, p=0,015), less Intraoperative blood loss (mean=432.45ml, standard deviation +/- 442,82, p=0.002) compared to conventional approach group operating time (mean=275.51 min, standard deviation +/- 88.61) and intraoperative blood loss (mean=735.45ml, standard deviation +/- 828,42).
CONCLUSION: CONCLUSION: Glissonean pedicle transection approach is safe method for reducing major Post hepatectomy liver failure.

PP-1032

Outcomes of living and deceased donor liver transplant recipients according to the MELD score

Juhan Lee, Jae Geun Lee, Seung Hwan Song, Dong Jin Joo, Dai Hoon Han, Man Ki Ju, Gi Hong Choi, Jin Sub Choi, Soon Il Kim, Myoung Soo Kim
Yonsei University College of Medicine, Korea

INTRODUCTION: Living donor liver transplantation (LDLT) has developed as an alternative to decease donor liver transplantation (DDLT) to overcome the critical shortage of deceased organ donations. However, the evidence supporting a LDLT for high model for end stage liver disease (MELD) score recipient is weak. We compared the outcomes of LDLT and DDLT according to MELD scores.
METHOD: The study included 498 adult patients who underwent liver transplantation between 2006 and 2014 at Severance Hospital (307 LDLT, 191 DDLT). Patients with multiorgan transplantation, pediatrics, and fulminant liver failure were excluded from the study. Recipients were categorized according to their MELD score into low (MELD

score ≤25) and high (MELD score >25) MELD group.
RESULTS: Recipient characteristics were similar between LDLT and DDLT, with the exception of higher MELD score in DDLT group (19.5 vs. 13.5, p<0.001). The DDLT donors were significantly older than LDLT donors (43.1 vs. 31.3, p<0.001). Hepatocellular carcinomas were present in 51.0% of the recipients (54.1% in LDLT vs. 46.1% in DDLT, p=0.141). The median follow-up was 32 months (range, 0 to 105 months). LDLT demonstrated similar graft survival to DDLT in low MELD group (86.9% vs. 74.8% at 5 years, p=0.065). Survival after LDLT was not inferior to DDLT in high MELD group (72.1% vs. 57.3% at 5 years, p=0.331).
CONCLUSION: LDLT provided similar survival to DDLT in high MELD score recipients. Thus, when deceased donor organs are scarce, LDLT could be a good therapeutic option in patient with high MELD score.

PP-1033

Venous reconstruction using the recipient's portal vein as venous patch grafts in pediatric living donor liver transplantation

Jinzhen Cai, Honghai Wang, Qingjun Guo, Junjie Li, Dahong Teng, Jiang Li, Wentao Jiang, Cheng Pan, Zhongyang Shen
Tianjin First Central Hospital, China

INTRODUCTION: Outflow reconstruction is of critical significance in pediatric LDLT. Inadequate outflow reconstruction could lead to severe graft dysfunction or loss. The left hepatic vein often showed two orifices, and as a result reconstruction of the left hepatic vein presents a major technical challenge in LDLT using left lateral grafts. We here studied the use of an opened recipient's portal vein as a venous patch graft for the hepatic venous reconstruction and anastomosis to the inferior vena cava in pediatric living-donor liver transplantation.
METHOD: From May 2014 to August 2015, 17 cases of the pediatric LDLT using left lateral lobe which grafts have two orifices of the left hepatic vein, and performed one-step venous reconstruction using the recipient's portal vein. The detailed method is that using the patient's own portal vein graft, which is split open and used as a vein patch to bridge the gap between the two orifices of the left hepatic vein. This simple technique permits a wide, triangulated outflow anastomosis. The patient profiles, operation time, estimated blood loss, harvested portal graft length, postoperative liver function and complications were recorded and studied.
RESULTS: The mean size of the graft is 2.7cm in length and 1.5 cm in width. The immediate graft function was excellent. Doppler ultrasound examinations on postoperative days 1-14 revealed excellent results. And the liver function recovered steadily after operation. There is no significant difference about the liver function compared with patient with single orifice of the hepatic vein. The patient was discharged from hospital 22 days after LDLT without complications. There was no case of occlusion of the reconstructed hepatic vein in the one-step reconstruction patients.
CONCLUSION: One-step reconstruction of the multi-orifice of left hepatic vein using recipient's portal vein grafts vein as venous patch grafts is an easy and feasible technique in pediatric LDLT.

PP-1034

Should branch portal vein tumor thrombosis be an absolute contraindication for liver transplantation in patients with hepatocellular carcinoma?

Prashant Bhangui, Tarun Piplani, Dheeraj Gautam, Amit Rastogi, Sanjay Goja, Sumana KR, Neeraj Saraf, Sanjiv Saigal, A S Soin
Medanta-The Medicity, Delhi-NCR, India

INTRODUCTION: Conventionally portal vein tumoral thrombosis (PVVT) is considered a contraindication for LT in HCC patients. It is still unclear whether segmental/branch

PVTT adversely affects recurrence and survival following LT to the same extent as main PV tumour thrombosis.
METHOD: We accept HCC patients for LDLT irrespective of tumour size and number, provided there is no extrahepatic or major vascular invasion.We analyzed our results following living donor LT (LDLT) in HCC patients with branch PVTT.
RESULTS: Of 1689 LDLTs performed till December 2014, 313 were for HCC; 23 (7.3%) had branch PVTT. PVTT location was Vp2 level (2nd order branch) in 13,and Vp3 (RPV, LPV) in 10 patients. Three recent patients with Vp2 and all Vp3 PVTT patients received neoadjuvant/ downstaging therapy. Vp3 PVTT patients were accepted only after disappearance of tumor enhancement/FDG-18 PET activity, post downstaging. Most patients had HCV cirrhosis (48%), 11 (48%) had AFP levels ≥200 ng/ml before LT,14 (61%) had FDG-18 PET avid tumours,14 were beyond UCSF criteria. Two operative deaths were censored. After a mean follow-up of 28 months, 15/21 (71%) patients are alive;14 (67%) without recurrence.Four patients died due to HCC recurrence, mean time to recurrence was 9 months.3-yr overall (OS) and recurrence-free survival (RFS) were 72%/66%;which is inferior compared to 87%/76%, respectively, in 284 HCC patients without PVTT. Among 6 patients who recurred, all had tumours beyond UCSF; 5 had PET avid tumours, 4 had AFP level ≥ 200 ng/dl, and 5 had not received any ablative therapy pre-LT. UCSF criteria predicted recurrence on multivariate analysis.
CONCLUSION: HCC patients with branch PVTT should not be excluded from LT right at the outset. Their survival after LDLT is acceptable, albeit worse as compared to those without PVTT. Results could be improved with downstaging to non-viability, especially in those with PET-avid, beyond UCSF tumours with high AFP levels.

PP-1035

Intrapulmonary shunting on macro-aggregated albumin scans in children undergoing liver transplantation for chronic liver disease

Vidyadhar Mali, Akinari Fukuda, Takanobu Shigeta, Hiroyuki Kanazawa, Yoshihiro Hirata, Kengo Sasaki, Baba Chiaki, Hajime Uchida, Masayuki Kitamura, Mureo Kasahara
National Centre for Child Health and Development, Japan

INTRODUCTION: Intrapulmonary shunting (IPS) is related to portal vein thrombosis, biliary complications and surgical infections in children following liver transplantation (LT) for chronic liver disease (CLD). Nevertheless, there are no established norms of the severity of IPS in such patients. This study aimed to investigate the cut-off value of IPS by macro-aggregated albumin lung perfusion scans (MAA) in paediatric LT.
METHOD: Of the 344 LT performed until June 2015, 21 patients fulfilled preoperative inclusion criteria of CLD (spider naevi/clubbing) and/or severe portal hypertension (variceal bleeding/ hepatofugal portal flow). Median age at LT was 8 years (7 boys, 13 biliary atresia, 5 congenital hepatic fibrosis, 1 Caroli's disease, 1 idiopathic copper toxicosis and 1 autoimmune hepatitis). Coexistent cardiopulmonary disease was ruled out by appropriate imaging. A receiver operating characteristic (ROC) curve analysis was performed to identify the cut-off value for normalization of shunt ratio (SR) on MAA (normal range < 15%) after LT.
RESULTS: The mean SR before and after LT was 21.4 + 6.2 % (range, 16.4-39.7%) and 16.4 + 2.7 % (range, 9.4-32.6%) respectively. The mean improvement in SR after LT was 6.8 + 7.6% (range, 0-29.5%). All patients were alive at follow-up (30.5±26.3 months, range 3-83months). There were 11 surgical complications (6 abdominal infections, 2 biliary strictures, 1 wound infection, 2 liver abscesses) in 9 patients. ROC analysis yielded a pre-operative SR cut-off value of 19.3% (sensitivity 66.7%, specificity 57.1%). Post-transplant surgical infections and biliary complications were more common (n=9) (p=0.05) in patients with SR >19.3%; with similar severity of liver disease (Childs) and portal hypertension (p=NS).
CONCLUSION: Preoperative MAA may identify potentially

reversible IPS in children listed for LT. A SR of 19.3% may screen paediatric CLD that are more prone for IPS-related surgical morbidity and, therefore, may indicate early timing of LT.

PP-1036

Efficacy of biliary splint at the anastomosis for postoperative endoscopic treatment of biliary stricture following living donor liver transplantation

Satomi Okada, Akihiko Soyama, Masaaki Hidaka, Amane Kitasato, Shinichiro Ono, Koji Natsuda, Takanobu Hara, Tota Kugiyama, Tamotsu Kuroki, Susumu Eguchi
Nagasaki University Graduate School of Biomedical Sciences, Japan

INTRODUCTION: For successful biliary anastomosis, significance of biliary splint at the anastomosis still remains controversial. In case of biliary stricture, endoscopic intervention is mostly performed as an initial intervention. In this study, we evaluated the results of endoscopic treatment for biliary stricture in patients with a placement of biliary splints.

METHOD: A retrospective study was conducted with 148 patients who underwent LDLT with duct-to-duct biliary anastomosis between April 2005 and May 2015. Biliary splint was placed in all cases; the splint was removed 3 months after the transplant. Patients who postoperatively underwent endoscopic placement of stents for biliary lesion were divided into 2 groups, successful group and failed group. We compared clinical factors of the two groups to clarify the risk factors associated with success of failure of the intervention.

RESULTS: Twenty-four patients underwent ERC. The successful group included 14 patients (58.3%) and the failed group included 10 patients (41.7%). Comparison between the two groups in terms of demographic, pretransplant, intraoperative and posttransplant data did not show any significant differences. Two patients developed biliary stricture within 3 months after LDLT. In these 2 patients, biliary splint was dislocated, and endoscopic intervention was failed. Twenty patients developed biliary stricture 3 months later after LDLT. In 15 of the 20 patients, split had been located at the anastomosis for 3 months, while splint was dislocated in the 5 of the 15 patients. The success rates of endoscopic intervention was 73.3% in the patients with splint without dislocation (n=15) and 60% in those with dislocation (n=5).

CONCLUSION: Endoscopic intervention was difficult in the case of early biliary stricture within three months. Therefore, the prevention of the early biliary stricture by placing biliary splint may lead to improve the success rate of endoscopic intervention.

PP-1037

Is large orifice the only solution to prevent outflow disturbance in right lobe living donor liver transplantation? : New simplified one-orifice venoplasty

Joo Dong Kim, Dong Lak Choi
Daegu Catholic University Medical Center, Korea

INTRODUCTION: Middle hepatic vein (MHV) reconstruction is often essential to avoid hepatic congestion and serious graft dysfunction in living donor liver transplantation (LDLT). The aim of this report was to the technical feasibility and outcomes of simplified one-orifice venoplasty.

METHOD: We compared clinical outcomes with three types of our one-orifice technique through retrospective review of recipients who underwent LDLT using right lobe graft at our institution from January 2010 to June 2015; group I (n = 60) received one-orifice technique that create the wider single outflow with patchwork method including central patch, group II (n = 106) received one-orifice technique that create single outflow using patch venoplasty without central patch, and group III (n = 34) received more simplified one-orifice

technique that invaginate reconstructed MHV into right hepatic vein without patch venoplasty.

RESULTS: Patient demographics and the overallsurvival rates did not differ significantly between the three groups, but cold ischemic time and operation time in group II and III were significantly lower than those in group I ($P < 0.05$). The early patency rates of MHV were similar in the three groups; 96.7%, 98.1% and 100% on postoperative day 7 and 95.0%, 94.3% and 94.1% on postoperative day 14, respectively ($p > 0.05$). Peak values in liver functional index within one month after LDLT was not different between three groups but total complication rates in group III was significantly lower than those in group I and II.

CONCLUSION: This new simplified one-orifice technique could be an effective method of overcoming technical difficulties and the outflow disturbance in right lobe LDLT without complex bench work to create large outflow.

PP-1038

Excellent outcomes of living domino liver transplantation using explanted donor livers from maple syrup urine disease patients

Hiroyuki Kanazawa[1], Vidyadhar Mali[2], Akinari Fukuda[1], Masatoshi Matsunami[1], Yoshihiro Hirata[1], Kengo Sasaki[1], Takanobu Shigeta[1], Hajime Uchida[1], Mureo Kasahara[1]
[1]National Center for Child Health and Development, Japan
[2]National University of Singapore, Singapore

INTRODUCTION: There are 11 reports of domino liver transplantation (DLT) using structurally and functionally normal explanted livers as donor allografts from maple syrup urine disease (MSUD) recipients. We report our experience with 4 patients who were successfully treated by DLT from MSUD donors.

METHOD: The age of 4 second recipients at DLT was median 30.5 months (range, 23 - 243 months). The primary disease was protein C deficiency, biliary atresia, familial hypercholesterolemia and congenital hepatic fibrosis. We evaluated the transection site of the vessels based on 3 dimensional computerized tomography scan (3D-CT) of the first donor and recipient pre-operatively.

RESULTS: Three whole liver grafts and 1 right lobe graft from MSUD patients were used for second recipients. Actual graft-recipient body weight ratio was median 2.10% (range, 1.24 to 3.52%). Cold ischemic time was median 4.6 hours (range, 3.6 to 5.8 hours). Warm ischemic time was median 29.5 minutes (range, 23 to 45 minutes). Operation time was median 476 minutes (range, 303 to 750 minutes). None of the second recipients experienced any vascular complications. All patients were alive and maintained normal liver function tests and branched-chain amino acids homeostasis. Median follow-up period was 271.5 days (range, 167 to 500 days).

CONCLUSION: DLT using explanted livers from MSUD patients as donor allografts for second recipients is feasible and safe. Meticulous planning with regards to vascular anatomy and transection lines in the MSUD "donor" contribute to prevention of vascular complications in the second recipient.

PP-1039

The challenges of starting living donor liver transplant (LDLT) program in Indonesia

Toar Lalisang, Yarman Mazni, Wifanto Jeo
Cipto Mangunkusumo Hospital, Indonesia

INTRODUCTION: LDLT program is not only about the surgery but a sustained program as a whole.

METHOD: Progress report of LDLT program.

RESULTS: Started at Karyadi hospital Semarang on January 2006, followed by Sutomo Hospital, Surabaya on February 2010. Both are pediatric cases with living related donor. There is no further LDLT report from both centres until now. In December 2010, Cipto Mangunkusumo hospital Jakarta, supported by a well established centre from abroad, performed the first adult LDLT; a male with cirrhotic liver

and his daughter as donor. Next case was a child with autoimmune hepatitis. The following year, 5 cases were planned. Two cases were successfully done, the others were demise due to unmatched schedule between the supporting team and patients' condition. With assistance from another institution the program started again in 2014 Two LDLT cases of pediatric biliary atresia were conducted. During this period, another two cases were operated in private hospital in Jakarta and were supported by us. In 2015, 5 cases were performed, 2 adults and 3 pediatrics. All are living related donor. The increase of LDLT surgery in our institution this year was due to the regular assistance from a reputable centre. Two cases are planned to be conducted by the end of 2015. Up to 12 cases of LDLT will be prepared every 2 months in 2016.

Soon, Adam Malik Hospital in Medan will also start LDLT program.

CONCLUSION: A periodical program with continuous support from a well established team with a comprehensive patient database are important to build a liver transplant unit.

PP-1040

Dealing with tuberculosis in the living donor liver transplantation setting : A decade of experience from India

Prashant Bhangui, Sanjiv Saigal, Viraj Khandolkar, Amit Rastogi, Sanjay Goja, Sumana KR, Narendra Choudhary, Neeraj Saraf, A S Soin
Medanta-The Medicity, Delhi-NCR, India

INTRODUCTION: Managing prospective or post- LDLT recipients with ongoing or previous Mycobacterium tuberculosis (TB) infection is challenging, especially given the hepatotoxicity of most anti tubercular therapy (ATT) drugs. Long-term outcomes have been seldom reported.

METHOD: Of 1689 LDLT's performed between 2004 and 2014 at our center in India (an endemic area for TB), 82 recipients had ongoing, past or post-LT TB. Eleven presented with ATT induced acute or acute on chronic liver failure [Group A], 27 were either already receiving or diagnosed and started on ATT during LT evaluation [Group B], 29 had past history of treated TB [Group C], in 6 recipients abdominal TB was diagnosed either during LT or in the explanted liver [Group D], 5 developed de-novo TB post LDLT [Group E], while 5 received post LT prophylaxis due to donor TB [Group F]. Our aim was to analyse prevalence, demographics, disease characteristics; and report on management strategy and outcomes in these patient subgroups.

RESULTS: Recipients were predominantly male (71%), median age was 48 years, pulmonary TB was most common (46%). A modified ATT regimen consisting of isoniazid (INH), ethambutol, fluoroquinolone and Amikacin/Pyrazinamide was used in Groups A, B, D and F, Group E recipients received standard 4-drug ATT (INH, rifampicin, pyrazinamide and ethambutol), while Group C recived INH prophylaxis post-LT. Mean follow-up (FU) in 71 recipients (excluding postoperative deaths and patients with < 6 months FU) was 49 months. Post-LT, 4 recipients developed ATT-related mild transient hepatitis which recovered with supportive management, 1 developed MDR-TB. 6 recipients (8%) died, none due to TB.

CONCLUSION: Using a modified (liver-safe) ATT regimen, we achieved good long term results in various subgroups of recipients with pre- or post-LDLT TB. Associated TB infection should not exclude patients from LDLT. Stringent screening and close FU for TB are essential, especially in endemic areas.

PP-1041

Liver transplantation in viral hepatitis B and C

Maxat Doskhanov, Danyiar Toksanbaev, Nariman Sadikov, Shokhan Kaniev
surgeon, Kazakhstan

INTRODUCTION: In the Republic of Kazakhstan patients with end stage liver disease of viral etiology presents around

60% among all patients with end stage liver diseases, as some regions of Kazakhstan are endemic for viral hepatitis

METHOD: Since December 2011, in Syzganov's National Scientific Center of Surgery performed 31 liver transplantations. Among them, there were 22 (70.1%) living donor liver transplantations and 8 (29.9%) cadaveric donor liver transplantation, including one cadaveric donor liver re-transplantation.

Five transplanted patients had liver cirrhosis in the outcome of viral hepatitis C.

Seventeen patients underwent liver transplantations for hepatitis B liver cirrhosis, with delta agent (16 patients) or without it (1 patient). Before the operation, 13 patients had DNA-negative status, and another 4 patients had DNA-positive status and with contraindications for antiviral therapy. All patients received such antiviral medicines as nucleoside analogues (Entecavir-2 and Tenofovir-14) after liver transplantation.

Since 2014, in 11 cases we used Human Hepatitis B Immunoglobulin» (HHBI), intraoperatively.

RESULTS: There were no cases of hepatits B reinfections after liver transplantations in our experience. PCR for viral hepatitis B after transplantations was negative in all patients, including 4 patients with DNA-positive status. This fact could be explained as an impact of HHBI usage. The patients who did not receive human hepatitis B immunoglobulin had an HBsAg till 6 months according to results if immunofluorescenceanalysis. The patients who received human hepatitis B immunoglobulin had HBsAg disappeared within 7 days after operation.

In patients with viral hepatitis C, PCR results remained positive after transplantations, but without significant clinical manifestations. One patient had a second degree of liver fibrosis (F2), so he could receive the antiviral therapy, with positive effect.

CONCLUSION: Antiviral therapy in liver cirrhosis of viral etiology is a key aspect of postoperative treatment of patients, along with immunosuppressive therapy.

PP-1042

Post-liver transplant follow up: experience at a tertiary care center

Mudassir Laeeq, Nasir Luck, Haider Mehndi, Rajesh Mandhwani, Ghous Bux Somro, Javaid Iqbal, Abdal Waseem
SIUT, Pakistan

INTRODUCTION: Due to shortage of cadaveric livers, living donor liver transplantation is becoming more common.They are subsequently followed-up in for management of day to day problems and complications.

METHOD: The Post-Liver Transplant Care Clinic was started at SIUT Two year back. The patients who are being followed-up in the clinic were included in this analysis. Baseline characteristics and follow-up events were recorded.

RESULTS: A total of 76 liver transplant patients have so far registered at our clinic. Median age is 42 years (range 2 to 60 years); 62 are male. Most of the patients had liver transplant due to HCV related cirrhosis (38 patients; 50%), while HBV-HDV co-infection (8 patients; 10.5%) were the second most common cause. Other causes included biliary atresia (7 patients; 9.2%), cryptogenic cirrhosis (5 patients; 6.6 %) PFIC, Wilson's disease, HBV-HCC,HCV-HCC,HBV-HCV 2 patients respectively. Alcoholic liver disease (1) NASH, PSC, PIH,hemangioendothilioma, BCS and GSD 1 patient respectively. All of them had living donor liver transplant. 16 patients (21.1%) developed anastomotic stricture and underwent ERCP and stenting. Biliary leak developed in 5 patients (6.6%), RCC and fibrosing cholestasis hepatitis in 1 patient (3.3 %),post-transplant DM in 36 patients (47.1%), HTN in 17 patients (38.6%),dyslipidemia in 19 patients (25%) and infections in 22 patients (50%). HCV recurred in 34 patients. Pegylated Interferon with ribavirin was offered to 27 patients 18 of them achieved sustained virological response,while sofusbuvir and ribavirin given to 7 patients all of them achieved rapid virological response.

CONCLUSION: Hepatitis Crelated cirrhosis was the most common indication. Biliary anastomotic stricture was the most prevalent complication after transplant.

As liver transplantation is becoming more widely available for Pakistani patients at home and abroad, the gastroenterologists in our country should be sensitized, and skilled to look after post-transplant care of these patients.

PP-1044

Successful experiences of abo-incompatible adult living donor liver transplantation for high-urgency patients in a single institute

Seok-Hwan Kim, Gi-Won Song, Sung-Gyu Lee, Shin Hwang, Ki-Hum Kim, Chul-Soo Ahn, Deok-Bog Moon, Tae-Yong Ha, Dong-Hwan Jung, Gil-Chun Park
Asan Medical Center, Korea

INTRODUCTION: ABO-incompatible (ABOi) adult living donor liver transplantation (ALDLT) is not a suitable treatment option for high-urgency patients because of a preparatory period (about two weeks).
METHOD: This report presents our experience in ABOi ALDLT in 3 patients with high-urgent circumstances between December 2014 and August 2015.
RESULTS: The mean age of recipients was 48.5 ± 5.7 years (range, 40-54 years). The mean Model for End-stage Liver-Disease score was 20 ± 4.0 (range, 9-22). The plasma exchange (PE) was performed 3 days after administration of rituximab. Two times of PE were done in all case before ALDLT. Isoagglutinin (IA) titers and CD19+/CD20% ratios of all patients were below 1:8 and 1.0%. The one patient experienced postoperative complication that need to surgical approach (wound dehiscence). The all of the patients and graft survivals were 100% at a mean follow-up period of 6months. There was no episode of antibody-mediated rejection (AMR).
CONCLUSION: ABOi ALDLT for high-urgency patients, therefore seems to be a safe and feasible therapeutic modality.

PP-1045

Acute graft versus host disease after liver transplantation: single center experience and review of literature

Woo-Hyoung Kang, Shin Hwang, Gi-Won Song, Dong-Hwan Jung, Ki-Hun Kim, Gi-Chun Park, Tae-Yong Ha, Chul-Soo Ahn, Deok-Bog Moon, Sung-Gyu Lee
Asan Medical Center, Korea

INTRODUCTION: Acute graft versus host disease is a rare but life-threatening complication of solid organ transplantation. The incidence rate of GVHD after LT is reported to be only 0.1% by the United Network for Organ Sharing. Almost GVHD occurred in pattern of cellular type-attacked by donor lymphocyte originating from the transplanted liver. They are diagnosed by demonstration of chimerism of donor lymphocyte and histologic confirmation on skin and GIT. Treatment of GVHD is known for high dose methyl-prednisolone and other lymphocyte or APC targeting monoclonal antibodies. This study intended to assess treatment of GVHD and prognosis with our experience and published literature review.
METHOD: Among 4294 patients performed LT between 2000 and 2015 in Asan Medical Center, we identified 5 patients (0.1%) who diagnosed as GVHD by demonstration of chimerism with STR-PCR or by histologic finding. we analysed clinical manifestations, treatment modality and prognosis from our data and literatures.
RESULTS: Mean patient age was 55.8 years (range: 54 - 69) and all were male. 2 patients were transplanted from deceased donor, the other 3 patients from living-donor son. Onset of disease was between post-operative 14 to 32 days. Initial symptoms were fever and skin rash. All were confirmed to GVHD by skin biopsy. 3 patients were demonstrated donor lymphocyte chimerism on recipient blood by STR-PCR. They are treated by methylprednisolone. 1 patients was tried to administer rituximab. But. aggravated pancytopenia, all were died from septic complication

CONCLUSION: Because of very poor outcomes of GVHD, Early diagnosis and treatment are important. Newer strategies and regimen are needed for treatment of GVHD.

PP-1048

Liver transplantation (LT) is a treatment option to rescue patients with budd-chiari syndrome (BCS) non responsive to either medical or surgical therapy.

Seok-Hwan Kim, Chul-Soo Ahn, Sung-Gyu Lee, Shin Hwang, Ki-Hum Kim, Deok-Bog Moon, Tae-Yong Ha, Gi-Won Song, Dong-Hwan Jung, Gil-Chun Park
Asan Medical Center, Korea

INTRODUCTION: Liver transplantation (LT) is a treatment option to rescue patients with Budd-Chiari syndrome (BCS) non responsive to either medical or surgical therapy.
METHOD: We did tight atrium-vena caval anastomosis with a Dacron graft for BCS in adult Living donor liver transplantation (LDLT) first in world at May 2006.
RESULTS: Of 741 patients who underwent LDLT from January 2006 to December 2008, 6 patients (1 male and 5 females) were received LDLT for BCS. Atrio-caval anastomosis technique was applied to all of six patients and they are all survived without surgical and thrombotic complications.
CONCLUSION: IVC replacement with a large-caliber Dacron interposition graft between the right atrium and infrahepatic IVC is feasible technique in LDLT.

PP-1049

ABOi LDLT for HCC

Youngin Yoon, Sung-Gyu Lee, Ki-Hun Kim, Shin Hwang, Tae-Yong Ha, Gi-Won Song, Dong-Hwan Jung, Gil-Chun Park, Chul-Soo Ahn, Deok-Bog Moon
Ulsan University College of Medicine, Korea

INTRODUCTION: Living Donor Liver Transplantation (LDLT) offers a chance of cure for hepatocellular carcinoma (HCC) and the underlying liver cirrhosis simultaneously as an alternative to deceased-donor liver transplantation (DDLT). If ABO-Incompatible (ABOi) LDLT is practicable, the reduction of waiting times for DDLT with the risk of drop out due to tumor progression provides a chance of long-term survival for some patients with HCC.
METHOD: We have studied all patients (n=693) undergoing LDLT due to HCC from November 2008 to June 2014 at the Asan Medical Center in Korea. 693 ALDLT cases for HCC including 115 ABOi recipients were included.
We analyzed and compared the overall patient survival, recurrence free survival and recurrence rates between ABOi and ABO-compatible (ABOc) recipients.
RESULTS: For ABOi and ABOc recipients, we found comparable patient overall survival rates [Hazard ratio (HR) = 1.05, 95% confidence interval (CI) = 0.53-2.08,p=0.884] and recurrence free survival posttransplant rates [HR = 1.49, 95% CI = 0.89-2.50].
CONCLUSION: our experience showed a possibility that blood group-incompatible liver transplantation can be a feasible option for patients with HCC, when no compatible living donor is available.

PP-1050

Does that really mean that living donor liver transplantation as the treatment of intrahepatic Cholangiocarcinoma?-single center experience

Wan-joon Kim, Sung-Gyu Lee, Shin Hwang, Ki-Hun Kim, Deok-Bog Moon, Tae-Yong Ha, Gi-Won Song, Dong-Hwan Jung, Gil-Chun Park
Asan Medical Center, Korea

INTRODUCTION: Even now, intrahepatic cholangiocarcinoma (IHCCC) is a controversial disease entity which is not a widely accepted indication for living donor liver transplantation (LDLT). The present study describes our

institutional experience with patient who underwent LDLT for IHCCC

METHOD: A retrospective analysis was performed on 8 consecutive patients with IHCCC among the 2251 patients who underwent LDLT between January 2003 and December 2010 at our center.

We reviewed patient that has IHCC as solitary lesion at liver only.

RESULTS: The median survival time was 76 months (7-130). Retrospectively, the perioperative mortality and the tumor recurrence rate were 0 and 50%. Five patients are currently alive 130,119,95 and 76 months after LDLT and the patients that recurred tumor were died of tumor recurrences at 15,86,10 and 7 months after LDLT. Recur site was noted that 2 cases were liver, 1 cases were bone and the remaining case were lymph node at para-aortic area.

CONCLUSION: With better and strict patient selection, the prognosis of LDLT for IHCCC could be improved.ICC patients with lymph node metastasis or vascular or bile duct invasion should be contraindicated for LT. For transplantation to be a viable treatment for unresectable ICC in the future, more effective adjuvant therapies are necessary.

PP-1051

Outcome and technical feasibility of hepatic re-transplantation at a large volume living donor liver transplantation center

Wan-joon Kim, Sung-Gyu Lee, Shin Hwang, Ki-Hun Kim, Chul-soo Ahn, Deok-Bog Moon, Tae-Yong Ha, Gi-Won Song, Dong-Hwan Jung, Gil-Chun Park
Asan Medical Center, Korea

INTRODUCTION: Re-transplantation is the only therapeutic option for irreversible graft failure. The aim of this study was to analyse a single center's experience of the outcome of liver retranplantation and reviewed the technical feasibility and possibility of Living related retransplantation as another option of retranplantation.

METHOD: All patients who underwent LT twice or more than twice at single center between February 1994 and December 2014 were included. Total 4428 liver TPL (LDLT 3743,DDLT 685) were performed at our institute. To compare clinical outcomes including graft and patient survival rate, we defined the patients who underwent LT once during same period as control group.

RESULTS: The mean age of donor was 36.0±12.2 (6~62) years. Donor age has distributed as 30.0% (<30yrs), 44.4% (30~45yrs) and 25.3% (>45yrs). The mean age of deceased donor was 35.9±13.0 and those of living donor was 36.8±8.0 (p=0.772). Original disease of re-TPL patient was shown that HBV related LC were 62 (42.4%), HCV related LC were 20 (13.7%), Fulminant hepatic failure (FHF) associated toxic material were 18 (12.3%), alcoholic related LC were 10 (6.8%) and biliary atresia were 9 (6.2%). The overall 1-,3-,5- and 10-year survival rates following primary TPL were 91.6%, 83.9%, 82.2%, 78.2% respectively. And the overall 1-,3-,5- and 10-year survival rates following Re-TPL were 68.3%, 61.2%, 58.5%, 58.5%.

CONCLUSION: Overall survival of retranplanatation patients has improved in recent years. If we overcome the technical issues and medical problem well, Living related retansplanation will be another option that shortened waiting period of cadaver consequent preventing of deterioration of medical problem.

PP-1052

Portal vein stenting is a significant risk factor for biliary stricture in adult living donor liver transplantation: matched case-control study

Min Ho Shin, Deok Bog Moon
Ulsan University College of Medicine, Korea

INTRODUCTION: Although perioperative portal vein (PV) stenting has been successfully performed to treat steno-occlusive disease in adults undergoing living donor liver transplantation (LDLT), the incidence of biliary anastomotic

stricture (BAS) after PV stenting was high. This matched case-control study was designed to clarify the relation between BAS and PV stenting, and to determine the mechanism of BAS and measures to reduce its incidence.

METHOD: Forty-four LDLT recipients who underwent stenting crossing the PV anastomosis were classified as the Stent group and matched 1:3 with a Control, non-stented group (n = 131).

RESULTS: The incidence of BAS was significantly higher in the Stent than in the Control group (43.2% versus 17.6%, p = 0.001). Cumulative 6 month and 1, 2, and 5 year BAS rates were 31.8%, 34.1%, 41.4%, and 43.2%, respectively, in the Stent group and 13.0%, 13.8%, 16.1%, and 17.8%, respectively, in the Control group (p = 0.001). Multivariate analysis showed that the size of the bile-duct (BD) opening, PV stenting, and acute cellular rejection were independent risk factors for BAS. A PV stent crossing the anastomosis may place extrinsic pressure on the adjacent peribiliary vascular plexus of the graft side, resulting in pressure-induced ischemic damage to the BD and BAS.

CONCLUSION: In conclusion, PV stenting per se is an independent risk factor for BAS. Although PV stenting is a reliable and convenient modality in the treatment of steno-occlusive PV during adult LDLT, stent placement crossing the PV anastomosis should be avoided, even when indicated.

PP-1053

Long-term outcome of ischemia-type biliary stricture after endoscopic treatment in liver living donors

Jae Hyun Kwon, Dong-Hwan Jung, Sung-Gyu Lee, Shin Hwang, Ki-Hun Kim, Chul-Soo Ahn, Deok-Bog Moon, Tae-Yong Ha, Gi-Won Song, Gil-Chun Park
Asan Medical Center, Korea

INTRODUCTION: The wall of normal proximal bile duct is often thin with close approximation of the right hepatic artery (RHA), thus isolation of RHA can result in excessive thinning of the remnant proximal bile duct wall during right liver graft harvest. This injury can induce delayed stricture of the donor common bile duct.

This study intended to review the clinical course of such ischemia-type donor bile duct injuries which were primarily managed with endoscopic treatment.

METHOD: A retrospective review of medical records was performed with 4 donors who suffered from ischemia-type donor bile duct injury and followed up for more than 5 years.

RESULTS: A right liver graft was harvested from these 4 donors (incidence of 0.1%), whose mean age was 29.5±3.1 years and all were male. Bile duct anatomy was normal bifurcation in 2 and anomalous branching in 2. All of them recovered from donor surgery and discharged uneventfully, but liver function abnormality and/or subclinical left hepatic duct dilatation was identified 1-2 months after surgery. After imaging study including magnetic resonance cholangiography, they underwent endoscopic balloon dilatation and temporary stent (endoscopic retrograde biliary drainage [ERBD]) insertion. With ERBD tube change per 2 months, ERBD tubes were successfully removed after 4 to 6 month. On yearly follow-up for 5 years, none of these patients showed any evidence of recurrence of biliary stricture.

CONCLUSION: Based on our experience, endoscopic treatment and subsequent long-term follow-up appears to be an effective and reasonable treatment for ischemia-type biliary stricture in liver living donors.

PP-1054

Vena caval replacement with cadaveric caval graft for living donor liver transplantation in budd-chiari syndrome associated with hydatid cyst surgery: a case report

Deniz Balci[1], Elvan Onur Kirimker[1], Serkan Durdu[2], Selcuk M Hazinedaroglu[1], Basak Ceyda Meco[2], Menekse Ozcelik[2], Ali Abbas Yilmaz[2], Ruchan Akar[2]
[1]*Ankara University School of Medicine, Turkey*

[2]*Ankara University, Turkey*

INTRODUCTION: Hydatid Cysts, occuring usually as a result of echinococcus granulosus infestation, can cause Budd Chiari Syndrome (BCS) and may lead cirrhosis. In cases with decompansated cirrhosis liver transplantation is the only curative treatment even if patient has a narrowed or obliterated inferior vena cava.

METHOD: 31-year-old woman was referred from a city hospital. She was diagnosed as Budd Chiari Syndrome. She had a history of three hydatid cyst operations before age of 10. Portal, mezenteric and hepatic vein computed tomography showed nodular cirrhotic liver parenchyma, invisible hepatic veins as well as narrowing of intrahepatic and subhepatic vena cava. Genetic tendency for coagulopathy or procoagulan disorder was not diagnosed. Firstly planned transjugulary intrahepatic portosystemic shunt was not found suitable for the patient by experienced interventional radiologists because of the existence of calcified hydatic cyst remnants on the parenchymal route of the shunt. Living donor liver transplantation (LDLT) from his brother was planned. Left lobe LDLT was performed under veno venous bypass an total caval clampage with concurrent replacement of vena cava with a vena cava graft from a deceased donor.

RESULTS: Recipient was haemodynamically stable during operation. Recipient operation time was 16 hours. She was discharged after postoperative 28 days hospitalisation. Patient is healthy without any complaint 19 months after operation. Vena cava graft patency was checked during her follow up by ultrasound and she has not experienced a complication about venous outflow of the liver graft.

CONCLUSION: In conclusion in cases of Budd-Chiari Syndrome with diseased vena cava replacement of vena cava by a cadaveric vena cava graft under veno-venous bypass is a safe operation promising fluent venous outflow for long term survival of the graft and the patient.

PP-1055

Hepatic histologic change after weight reduction in potential living liver donors with fatty liver

YoungRok Choi[1], Suk-Won Suh[2], Jeong-Moo Lee[2], Hyeyoung Kim[2], Hae Won Lee[2], Nam-Joon Yi[2], Kwang-Woong Lee[2], Kyung-Suk Suh[2]
[1]*Seoul National University Bundang Hospital, Korea*
[2]*Seoul National University College of Medicine, Korea*

INTRODUCTION: Fatty liver is critical for donor selection, which has been associated with a risk of complication for both donor and recipient after liver transplantation. After living donor weight reduction for a short-term, the change of liver fat percentile and pathologic findings were investigated.

METHOD: A total of 356 living donor candidate were between January 2011 and November 2013 at a single center. Of them, 18 donors tried to lose their weight reduction. Fat fraction was estimated on preoperative non-invasive MR spectroscopy. And liver biopsy findings were analyzed before and after weight reduction.

RESULTS: Eighteen donor candidates lose mean 3.6 ± 3.1 kg of their weight for mean 43.9 ± 31.0 days (range 7-107 days) and BMI was significantly decreased to 25.9 ± 3.1 kg/m^2 from 27.1 ± 3.2 kg/m^2 ($p < 0.001$). Their fat fractions were also significantly decreased to 6.8 ± 4.5% from 11.4 ± 4.7% ($p < 0.001$). Although preoperative liver biopsy showed that ballooning change (n=3, 23.1%), inflammation (n=9, 69.2%), fibrosis (n=2, 15.4%) and necrosis (n=3, 16.7%) before weight reduction, intraoperative biopsy showed no fibrosis, no necrosis, decreased inflammation (n=2, 17.6%) and improved ballooning change of hepatocyte (n=1, 5.9%) after weight reduction [table 1]. Although one candidate could not donate his liver finally because of steatohepatitis, the others recovered uneventfully.

CONCLUSION: Donor body weight reduction can expand donor pool and contribute to improving donor safety.

PP-1057

Predictors of response to interferon / ribavirin therapy in patients with hepatitis c virus infection at upper egypt

Aly Kassem
Sohag Faculty of Medicine,Sohag University, Egypt

INTRODUCTION: The combination of interferon (INF) and ribavirin is the preferred treatment for chronic hepatitis C viral (HCV) infection. However, nonresponse to this therapy remains commonand is associated with several factors. Our aim is to determine predictors of response to therapy in chronic HCV infected patients treated with combination of INF alpha and ribavirin.

METHOD: The study included 110 patients with chronic HCV infection. Their ages ranged from 20-59 years. 107 liver biopsies were submitted to histopathological examination. Modified hepatic activity index (HAI) grading, modified Ishak staging, and Metavir grading and staging systems were used. Follow up HCV PCR at the 12th week to assess the early virologic response (EVR), and at the 24th week were done. HCV PCR was done at the end of the course and tested 6 months later to document end virologic response (ETR) and sustained virologic response (SVR) respectively.

RESULTS: One hudered seven patients completed the course of the study. Their ages ranged from 20-59 years. Six months after the end of treatment, patients were categorized into2 groups: Group (1): patients who achieved sustained virological response (SVR). Group (2): patients who didn't achieve (SVR) (non SVR) including {non-responders, breakthrough and relapsers}. 58 (54.2%) patients showed SVR, 18 (16.8%) patients were non-responders, 15 (14%) patients showed break-through and 16 (15%) patients were relapsers. Risk factors of non SVR were higher age, higher insulin level, higher Metavir stage and higher grade of hepatic steatosis. Multivariate binary regression analysis showed that the only independent risk factor for non SVR was high insulin level.

CONCLUSION: Younger age, lower Metavir stage, lower steatosis grade and lower insulin level are good predictors of SVR and could be used in predicting the treatment response of pegylated interferon/ribavirin therapy.

PP-1058

Cost-effectiveness and convenience of myrept® 500 mg tablet in recipients after liver transplantation

Suk Kyun Hong, Kwang-Woong Lee, Kyungchul Yoon, Hyo-Sin Kim, Adianto Nugroho, Takahiro Murokawa, Hyeyoung Kim, Nam-Joon Yi, Kyung-Suk Suh
Seoul National University Hospital, Korea

INTRODUCTION: Mycophenolate mofetil is the most common auxiliary immunosuppressant after liver transplantation to relieve calcineurin inhibitor related complications. There is one type of Cellcept® available, but Myrept® produced by Chong Kun Dang Company in Korea is available as 500 mg tablet as well as 250 mg capsule. However, there has been no clinical study to assess the feasibility of this generic product. Therefore, we aimed to evaluate the feasibility, cost-effectiveness, and convenience of Myrept® 500 mg tablet in recipients after liver transplantation.

METHOD: A 24 week, phase 4, single center, open-label, non-comparative study was employed. A total of 50 patients were recruited. Acute rejection, changes in blood chemistry, white blood cell count, renal function, adverse drug reaction and other characteristics of the patients were recorded for 24 weeks.

RESULTS: All enrolled patients and their grafts were survived within 24 weeks. There was no acute rejection. Mean serum creatinine was 0.82 ± 0.27 mg/dL at beginning of the study and reached 1.01 ± 0.2 mg/dL after 24 weeks and showed significant increase overall ($p < 0.001$). However, there was no clinical significance. Nine patients (18.75%) had adverse drug reactions which had been commonly reported in other Mycophenolate mofetil generic products, and there was no serious one. These adverse reactions

included gastrointestinal problems (nausea, vomiting, and abdominal discomfort), laboratory abnormality (mild increase of aspartate or alanine aminotransferase). The size of Myrept® 500 mg tablet is smaller than Myrept® 250 mg capsule (17.1 x 7.1 x 6.5 mm vs. 19.18 x 7.23 x 6.40 mm). When comparing the same dose, the cost is less expensive (1,344 Korean won vs. 1,792 Korean won for 500 mg).

CONCLUSION: In conclusion, Myrept® 500 mg tablet is feasible, cost-effective, and convenient in recipients after liver transplantation.

PP-1059

Alterations of hepatocellular bile salt transporters and effects of immunosuppressants after warm ischemic injury in rats

Hyeyoung Kim, Kwang-Woong Lee, Seung Cheol Oh, Geun Hong, Nam-Joon Yi, Hae Won Lee, Suk Kyun Hong, Kyung Chul Yoon, Hyo-Sin Kim, Kyung-Suk Suh
Seoul National University College of Medicine, Korea

INTRODUCTION: Warm ischemia (WI) and subsequent endogenous bile salt (BS) toxicity have been identified as important factors of intrahepatic bile duct strictures after liver transplantation. We aimed to identify the alterations of hepatocellular BS transporters and effects of immunosuppressants on it after WI in rats.

METHOD: We designed warm ischemic rat model mimicking donation after cardiac death throughout specific operation: ligation of hepatic artery, clamping of portal vein during 30 minutes, and catheterization of bile duct. Male Sprague-Dawley rats (250-310 g) were used. After designed operations, 30 rats were divided into three groups: WI only (n=10), sirolimus (WI+S, n=10), and tacrolimus (WI+T, n=10). They were sacrificed for procurement of liver at 1 week and 3 weeks (on halves). As control, 6 rats underwent sham-operation. Using liver tissue, protein expression of hepatocellular BS uptake (NTCP, OATP1B3) and export (MRP2, MDR2) transporters were quantitatively measured by Western blot.

RESULTS: At 1 week after WI, all 4 transporters were significantly increased (mean 767.6% in NTCP, 122.1% in OATP1B3, 530.5% in MRP2, and 282.7% in MDR2; all p=0.007) compared to control (100.0%). At 3 weeks, all transporters were decreased again. However, NTCP was still significantly high (mean 174.0%; p=0.005), and other transporters showed no significant differences compared to control (p=0.095). In rats treated with sirolimus or tacrolimus, NTCP was significantly reduced at 1 week (p=0.014 in WI+S vs. 0.027 in WI+T) and 3 weeks (p=0.028 vs. 0.009), compared to WI only group. In OATP1B3, there was no significant effect of both immunosuppressants. In export transporters, MRP2 was significantly reduced at 1 week (both p=0.014), and MDR2 was at 3 weeks (both p=0.047).

CONCLUSION: In conclusion, hepatocellular BS transporters are significantly increased after WI in rats. Sirolimus and tacrolimus have buffering effects on these WI induced alterations of BS transporters.

PP-1060

Gastrointestinal congestion dilates liver artery

Zhongping Cao
The Affiliated Hospital of Armed Force Medical University, China

INTRODUCTION: At the beginning of neohepatic stage during liver transplantation, hemodynamics change remarkedly, this article aimed to investigate whether the gastrointestinal congestion due to inferior cava vena and hepatic portal vein clamping can dilate the hepatic artery and the according mechanisms.

METHOD: The hepatic artery ring tension were tested after treatment with the plasma from the gastrointestinal congestion and superior cava vena individually. The effect of NO inhibitor on the hepatic artery ring tension induced by gastrointestinal congestion was examined. Reaction of

hepatic rings to nitric oxide synthase inhibitor and different vasoactive drugs (NE, AVP, MB) were examined after treatment with gastrointestinal congestion.

RESULTS: Gastrointestinal congestion could cause the hepatic artery ring dilatation, NO inhibitors could significantly reverse the ring tension induced by gastrointestinal congestion. The hepatic artery ring tension increased significantly by the treatment with nitric oxide synthase inhibitor and vasoactive drugs compared with that of control group.

CONCLUSION: The gastrointestinal congestion could cause hepatic artery ring dilatation through NO mechanism, NO inhibitor and nitric oxide synthase inhibitor can be used to restore the ring tension.

PP-1061

Conjoined unification venoplasty for graft double portal vein branches as a modification of autologous Y-graft interposition

Eunkyoung Jwa, Sung-Gyu Lee, Shin Hwang
Asan Medical Center, Korea

INTRODUCTION: Anomalous portal vein (PV) branching of the donor right liver is uncommon, but usually makes two separate PV branches at the graft. Autologous PV Y-graft interposition has been regarded as the standard procedure for such situations. However, inadequately adjusted alignment of PV anastomosis has occasionally resulted in a buckling deformity of the right posterior section (RPS) PV branch, which can lead to functional PV stenosis. A modified method of Y-graft interposition was therefore designed for secure PV reconstruction.

METHOD: Computational simulation and physical modeling resulted in conjoined unification venoplasty, consisting of unification patch placement between two sectional PV orifices and overlying coverage with a crutch-opened autologous PV Y-graft. The conjoined PV portion expands like a potbelly, with this shape providing a wide range of tolerance toward alignment mismatching of the PV anastomosis.

RESULTS: This refined technique was applied to two patients undergoing adult living donor liver transplantation using a modified right liver graft. Both recipients had hepatitis B virus-associated liver cirrhosis and hepatocellular carcinoma, and both donors had type III PV anomalies. Their right liver grafts were harvested and the graft PV orifices were reconstructed according to the refined technique. The PV confluence portion expanded as like a potbelly on follow-up imaging studies. The donors and recipients recovered uneventfully without any vascular complications.

CONCLUSION: The drawbacks of conventional portal Y-graft interposition can be overcome technically by conjoined unification venoplasty, in which it secures PV patency through hemodynamic-compliant offset of the RPS PV redundancy and its alignment error.

PP-1062

Tips and pitfalls of intraoperative direct spleno-renal shunt ligation at liver transplantation in patients with big spleno-renal shunt

Kyung Chul Yoon, Kwang-Woong Lee, Hyeyoung Kim, Suk Kyun Hong, Hyo Shin Kim, Nam-Joon Lee, Kyung-Suk Suh
Seoul National University Hospital, Korea

INTRODUCTION: The patient with big spleno-renal shunt (SRS) is challenging at liver transplantation (LT), irrespective of organizing portal vein (PV) thrombus. We introduced the clinical outcome of 16 patients who received intraoperative direct SRS ligation

METHOD: Among 580 recipients from Jan. 2010 to Jun. 2013, 16 patients underwent intraoperative SRS ligation. SRS was easily found and isolated below the distal pancreas in all cases. Pre-LT MELD score was 15.9±6.4 (8-33). Main PV diameter was 7.9±2.9mm (4.0-13.9). PV thrombectomy was accompanied in 7 cases.

RESULTS: Except one hospital mortality, 15 patients showed favorable outcome. The mortality was related with sepsis, but not with liver dysfunction. One patient received simultaneous splenic artery (SA) ligation due to strong PV flow during LT. Massive and prolonged ascites after LT was presented in four patients with small diameter of PV (<7.5mm). They were living donor recipients, and not related with pre-LT ascites. Among them, one patient received SA embolization at postoperative days 30, and ascites was well controlled after that. In the other three, ascites was tolerable and well controlled by drainage and/or diuretics. After the case of SA embolization, we performed test clamp of SRS before ligation in small diameter of PV, and applied PV pressure monitoring in patients who showed a sign of portal hypertension such as bowel edema. In two cases, we applied total or partial SRS ligation under PV pressure monitoring, within 8mmHg of pressure difference between pre- and post-SRS ligation. There was no portal hypertensive sign in the other 12 patients. Fifteen patients have maintained normal liver function until last follow-up.

CONCLUSION: Intraoperative SRS ligation was safe and effective method to solve big SRS. However, severe portal hypertension after shunt ligation needed to be concerned in small diameter of PV, and selective simultaneous intraoperative portal pressure monitoring could be helpful.

PP-1063

Enhanced formation of 3D printed hepatic structure with HepG2 cell line by 3D printing technique

Dooin Lee[1], Hyeryeon Jeon[1], Kyo Jin Kang[1], Su A. Park[2], Wan Doo Kim[2], Seung Sam Paik[3], Sang Hoon Lee[4], Dongho Choi[1]
[1]Hanyang University College of Medicine, Korea
[2]Korea Institute of Machinery and Materials, Korea
[3]Hanyang University Hospital, Korea
[4]Graduate School of Biomedical Science; Engineering, Hanyang University, Korea

INTRODUCTION: Chronic liver disease is one of the most fearful causes of death worldwide and whole liver transplantation is the only and definite treatment method for patients with end stage liver diseases. Although over thousands of liver transplantations being performed for a year in Korea, problems including donor shortage, surgical complications and cost hamper its usage. Recently tissue engineering technologies focusing on the field of regenerative medicine are considered as a breakthrough for these problems. Among them, 3-dimensional printing technology has been applied to mimic tissues or organs suitable for transplantation.

METHOD: HepG2 (human hepatocellular carcinoma) carrying mcherry was used in our experiment. 3D bioprinting machine (made by KIMM) was used for construction of 3D printed hepatic structures. Alginates have been extensively used as hydrogel synthetic biomaterials for cell immobilization, transplantation, wound healing devices, and tissue engineering due to their physical properties that are similar to natural tissues. After 20minutes, 25mm x 25mm wide 3D HepG2 hepatic structure was formed and cultured with media for 3 weeks. Morphologic analysis was done with fluorescence microscope. Histologic analysis was done with H&E staining and immunohistochemistry. Gene expression of liver specific marker such as ALBUMIN, ASGPR1, AFP and the others were also observed on day 1, 7, 14 and 21.

RESULTS: The cells were growing on the alginate scaffold, and gene expression was also increased. HepG2 by 3D culture grows more extensive than 2D culture and more similar to the structural aspects of the liver. That means 3D printed hepatic structure is feasible and able to recapitulate hepatic structure.

CONCLUSION: 3D bioprinting technology for making hepatic structure is one of the most important ways on regenerative medicine of the liver. With refinement of current experiment, it would be very simple and reliable technology for a bridge between basic science and clinical problems of the liver.

PP-1067

Donor and recipient lipid profile of liver transplantation - like father like son

Kevin Ka Wan Chu, See Ching Chan
Queen Mary Hospital, the University of Hong Kong, Hong Kong, China

INTRODUCTION: The outcome of liver transplant have been improving, which demands appropriate selections of the immunosuppressive regimen for every patient. Dyslipidaemia, a known side effect of immunosuppressant, is directly correlated with cardiovascular disease. This study is to review the lipid profile of liver transplant recipients, in order to identify factors associated with favourable lipid profile.

METHOD: Prospectively collected data of liver transplant recipients from January 2011 to June 2013 were retrospectively analyzed. Lipid profiles were compared between patients with deceased donor liver transplantation (DDLT) and living donor liver transplantation (LDLT). Predictive factors were identified and multivariable analysis was performed.

RESULTS: Total 165 patients who underwent liver transplant during the period were analyzed. 85 patients underwent DDLT while 80 patients underwent LDLT. The post-operative serum high density lipoprotein (HDL) was higher for the LDLT group, 1.48 mmol/L compared with the DDLT group, 1.28 mmol/L (p=0.026) at 1 year and 1.43 vs 1.21 mmol/L (p=0.008) at 2 years. Pre-liver transplantation baseline demographics were comparable except that more LDLT recipients were hospitalized. However, the donor of both groups differed in many ways. LDLT donors are younger, lighter in body weight, lower BMI, lower fasting glucose & triglyceride and higher HDL. LDLT had shorter cold ischaemic time, warm ischaemic time, and less grafts with severe fatty change. Univariate analysis was performed and identified predictive factors for favourable HDL including recipient body weight, recipient BMI, cold ischaemic time, moderate-severely steatotic grafts, LDLT, donor fasting glucose and donor HDL. In multivariable analysis, only donor HDL >=1.6 mmol/L (RR 4.311, p=0.003) and recipient BMI <24 (RR 2.753, p=0.037) were independent predictive factors.

CONCLUSION: Recipients of LDLT had better lipid profile compared with DDLT. The feature of high HDL in donors was transferred to recipients by liver transplantation

PP-1082

Adverse events after liver transplantation and associated factors for liver donors: a nationwide study in Taiwan

Chien-Chang Liao, Ta-Liang Chen
Taipei Medical University Hospital, Taiwan

INTRODUCTION: The perioperative outcomes after liver transplantation for liver donors were not completely understood. This study evaluated factors associated adverse events after liver transplantation for liver donors.

METHOD: Reimbursement claims from the Taiwan's National Health Insurance were used to investigate the outcomes after liver transplantation for 2301 liver donors aged 18 years and older in 2004-2013. Preoperative sociodemographics and coexisting medical conditions were collected. The adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of postoperative 30-day adverse events (such as septicemia, pneumonia, stroke, acute myocardial infarction, acute renal failure, deep wound infection, postoperative bleeding, urinary tract infection, and mortality) and associated factors were calculated in the multivariate logistic regressions.

RESULTS: Liver donors aged 60-69 (OR 4.37, 95% CI 1.53-12.5), and ≥70 (OR 13.3, 95% CI 4.73-37.2) years had increased risk of adverse events after liver transplantation. Preoperative epilepsy (OR 18.7, 95% CI 2.06-170), pulmonary tuberculosis (OR 7.77, 95% CI 1.94-31.2), liver cirrhosis (OR 2.87, 95% CI 1.33-6.20), hypertension (OR 2.26, 95% CI 1.06-4.81) were associated with adverse events

after liver transplantation for liver donors.

CONCLUSION: For liver donors, older age, epilepsy, pulmonary tuberculosis, liver cirrhosis, and hypertension were associated with adverse outcomes after liver transplantation.

PP-1083

Factors associated with increased medical expenditure and prolonged length of stay after transplantation for liver donors in Taiwan

Yi-Chun Chou[1], Chien-Chang Liao[2], Ta-Liang Chen[2]
[1]*China Medical University Hospital, Taiwan*
[2]*Taipei Medical University Hospital, Taiwan*

INTRODUCTION: Limited information was available on consumption of medical resource for liver donors after liver transplantation. This study evaluated factors associated medical expenditure (ME) and length of stay (LOS) after liver transplantation for liver donors.

METHOD: The claims data from the Taiwan's National Health Insurance were used to calculate ME and LOS after liver transplantation for 2301 liver donors aged 18 years and older in 2004-2013. Information on perioperative sociodemographic factors and medical conditions were collected. We used multivariate logistic regressions to calculate adjusted odds ratios (ORs) and 95% confidence intervals (CIs) of factors associated with increased ME (at the highest quintile of ME) and prolonged LOS (at the highest quintile LOS).

RESULTS: The mean of ME and LOS after transplantation for liver donors were 8908 US dollars and 17.9 days, respectively. Males (OR 1.40, 95% CI 1.07-1.83), age ≥70 years (OR 67.0, 95% CI 7.82-574), liver cirrhosis (OR 10.5, 95% CI 5.07-21.8), pulmonary tuberculosis (OR 7.19, 95% CI 1.09-47.2), and diabetes (OR 6.43, 95% CI 1.58-26.2) were associated with increased ME. These factors were also associated with prolonged LOS. The ME and LOS increased with the increasing number of medical conditions.

CONCLUSION: Older age, males, liver cirrhosis, pulmonary tuberculosis, and diabetes were risk factors for increased ME and prolonged LOS after liver transplantation for liver donors.

PP-1101

Outflow reconstruction using the homologous venous grafts in living donor liver transplantation: Experience at the University of Tokyo Hospital.

Yuichiro Mihara, Nobuhisa Akamatsu, Sumihito Tamura, Junichi Kaneko, Yoshihiro Sakamoto, Kiyoshi Hasegawa, Norihiro Kokudo
The University of Tokyo, Japan

INTRODUCTION: It is well accepted that not only the actual graft volume but also the uncongested volume of it is a key issue for the successful LDLT. Therefore, congested area should be minimized to the possible extent. Reconstructing the MHV tributaries, IRHV or caudate vein are important with this aspect, however, direct anastomosis between these vessels to IVC requires the technical difficulty and prolongs warm ischemic time. To overcome these problems, we have reported several innovations in the reconstruction of these veins at the bench surgery, utilizing the cryopreserved homologous veins.

METHOD: We have performed 462 adult LDLT. Of these 55% of the donors underwent right liver resection, 39% with left liver resection, and 7% with posterior liver resection. We routinely use the cryopreserved vein grafts for the outflow reconstruction, and herein present our way of venous reconstruction in LDLT.

RESULTS: Left liver graft and right liver graft is equal in terms of short- and long-term outcome, provided the proper graft selection algorithm. 90 days mortality rate was 5%. The incidence of severe complications (Clavien Grade IIIb and more) was 38%. The incidence of outflow obstruction requiring interventional or surgical treatment was 1.1%

in the left (2/179) and 2.3% in the right liver (6/257), respectively. Regarding the patency of the reconstructed veins, LHV MHV and RHV can achieve nearly 100% patency. On the contrary, venous tributaries such as V5, V8, and IRHV will be frequently occluded in postoperative course. V5 is the worst, about 60% will be occluded; V8 is the second, about 40% will be occluded; and IRHV is the best with over 80% patency. Among reconstructed venous tributaries of right liver graft, IRHV has the best patency.

CONCLUSION: In conclusions, outflow reconstruction is a key for the successful results. Cryopreserved vein graft is useful for the reconstruction.

PP-1102

Liver transplantation program in JSC "National Research Center for Oncology and Transplantology"

Yermakhan Assylkhanuly, Aiymkul Ashimkhanova, Gani Kuttymuratov, Mels Assykbaev, Kakharman Yesmembetov, Saidkarim Abdugaffarov, Adilbek Mukazhanov, Asan Zhaksembaev

JSC "National Research center for Oncology and Transplantology, Kazakhstan

INTRODUCTION: *Liver transplantation (LT) is the only viable option for patients with end-stage liver disease (ESLD). Kazakhstan is the country experiencing high need in Liver Transplantation with over 1000 patients with ESLD. All living donor liver transplantation performed with the participation of the experts from South Korea, Turkey and Belorussia.*

METHOD: We were intended to analyze the outcomes of deceased donor liver transplantation (DDLT) and those who had right lobe living donor liver transplantation (LDLT). Between from February 2013 to April 2015, a total of 8 patients, including one pediatric patient had undergone LT. The results are mostly characterized as median with range or as mean values with standard deviation.

RESULTS: 7 out of 8 patients were adults; remaining pediatric recipient is 7 years old, excluded from this analysis. The most prevalent cause of ESLD in DDLT group was characterized by autoimmune disorders: 2 recipients had primary biliary sclerosis and remaining recipient had cirrhosis due to autoimmune hepatitis. The cause of ESLD in LDLT group was represented by viral etiology: 1 due to cirrhosis from chronic HCV infection; 3 recipients had cirrhosis due to chronic HBV + HDV infections, 1 recipient with HBV+autoimmune hepatitis.

CONCLUSION: Our single-center experience emphasizes that we had similar survival in both DDLT and LDLT groups according to the data up to December 2014. With the last 2 more LDLT the survival for this group went up to 80%. Another take home message is that timely diagnosis of early post-operative complications is necessary to prevent mortality in recipients.

PP-1103

Producing artificial bile duct by 3D printers in rabbits

Dooin Lee[1], Suk-Hee Park[2], Bo-kyeong Kang[1], Youn Hwan Kim[1], Pill Sun Paik[1], Dongho Choi[1], Kyeong Geun Lee[1], Hwon Kyum Park[1], Han Joon Kim[1]

[1]Hanyang University College of Medicine, Korea

[2]Korea Institute of Industrial Technology, Korea

INTRODUCTION: As the surgeries regarding biliary system grows, complications involving bile duct stenosis, bile duct impairment, and iatrogenic bile duct injuries are increasing. Recent studies suggest synthetic and biological materials for the reconstruction of injured or narrowed bile ducts, alternative for native bile ducts. However, the complex anatomy of bile duct branches makes existing materials less satisfactory as artificial bile duct. Our research aims to develop artificial bile duct by using 3D printers, which can produce more detailed and differentiated designs.

METHOD: Two rabbits of 4Kg were used in the study. 3D images, extracted from MRCP performed on rabbits, were

reconstructed by Mimics (Materialise, Leuven, Belgium) program, and the data was post-processed by 3Matic (Materialise, Leuven, Belgium) program. Polyvinyl alcohol mould of artificial bile duct was made from the 3D images, surrounded by thin Polyacprolactone layer. Then, Polyvinyl alcohol mould was degraded, making complex and thin artificial bile duct.

RESULTS: In one rabbit, Extrahepatic bile duct from the confluence of both hepatic ducts to distal bile duct including gallbladder was made. In the other rabbit, extrahepatic bile duct from the confluence of both hepatic ducts was also made, although the gallbladder was undetectable in the second rabbit. The diameter of the extrahepatic duct is about 2-4mm, which is very similar to that of the native bile duct in course and curvature.

CONCLUSION: For bigger individuals, like humans, we presume that more detailed bile duct branches, up to 2nd order hepatic branches, can be regenerated. Better images and 3D printers will be needed for more complicated and detailed intrahepatic bile ducts. Complex artificial bile duct from suitable materials will reduce limitations in surgeries involving bile duct and liver. With the development of bio-compatible and easy-to-handle materials, we can also expect to regenerate vessels and other tubular structures, and further provide scaffolding for artificial liver.

PP-1114

Prevalence and related factors of fatigue after liver transplantation

Hyo-Sin Kim
Seoul National University Hospital, Korea

INTRODUCTION: Fatigue is common in chronic hepatitis and end-stage liver disease. However, little is known about fatigue after liver transplantation (LT). We therefore evaluate the prevalence of fatigue and related factors after LT.

METHOD: We retrospectively reviewed the adult recipients who responded to our survey at out-patient clinic between April and May 2013. Fatigue and severity of it were assessed by the questionnaire with the Fatigue Severity Scale (FSS). We defined the fatigue as in case of FSS of 4.0 and more, and severe fatigue as in FSS over 5.0. The related factors including hepatocellular carcinoma and complications were analyzed.

RESULTS: Total 93 patients were included in this study. Mean age was 54.9 (19-76) years and two-thirds were men (67.7%). Living donor LT was 77.4%. Hepatitis b related liver disease was the main etiology of LT (77.4%), and hepatocellular carcinoma accompanied in 33.3%. Mean follow-up period was 66.8±43.2 (range, 2-171) months. Mean FFS was 2.83 (range, 1.0-6.7). Of the 93 adult patients, fatigue was presented in 20 (21.5%) of all patients. Among them, 9 (9.7%) of patients showed severe fatigue. Even though post-LT complications tended to be greater in fatigue group (50.0% vs. 31.1% in non-fatigue group, p=0.098), there were no significantly related factors for fatigue after LT, including hepatocellular carcinoma and major complication.

CONCLUSION: Fatigue is present in a considerable portion of recipients after LT. Further studies and concerns are needed in this field.

PP-1115

A case report of drug-induced thrombocytopenia after living donor liver transplantation

Keisuke Arai, Kaori Kuramitsu, Takumi Fukumoto, Masahiro Kido, Atsushi Takebe, Motofumi Tanaka, Hisoka Kinoshita, Tetsuo Ajiki, Hirochia Toyama, Ku Yonson
Hepato-Biliary-Pancreatic Surgery, Japan

INTRODUCTION: After living donor liver transplantation (LDLT), there are several causes to decrease platelet count.

METHOD: A 61-year-old female consulted for liver transplantation at our facility. In January 2014, she was referred to local hospital for liver dysfunction and diagnosed

as hepatitis C-related cirrhosis (HCV-RNA 6.3 Log IU/mL, antigenicities of group 1). Although alleviation therapy was administered, HCV did not decrease and routinely followed at outpatient clinic. In March 2015, she was hospitalized because of sepsis caused by pyelonephritis. Although antibiotic treatment improved the infection, hepatorenal syndrome could not be controlled, and she was referred to our facility for liver transplantation. In June 2015, she was performed LDLT using a left lobe graft from her son.

RESULTS: After transplantation, immunosuppression regimen consisted of tacrolimus and steroid. Seven weeks after LDLT, interferon free therapy with daclatasvir and asunaprevir was started. Side effect of liver dysfunction did not appear, and she was discharged from the hospital 7days after the introduction of Direct-acting antiviral (DAA) therapy. Thirteen days after starting DAA therapy, HCV virus turned negative, however, platelet count gradually decreased just before starting the DAA regimen. Suspected of DAA drug side effect, these two drugs were stopped. However, she finally developed severe thrombocytopenia (platelet count 17,000/μL), which need transfusion. Suspected of tacrolimus derived drug side effect, we converted tacrolimus to cyclosporine. Afterward her platelet count gradually recovered after discontinuance of antiviral drugs, viral marker is not detectable up to 2 month.

CONCLUSION: Recently we experienced a severe drug-induced thrombocytopenia, which was supposed to be caused either by DAA or tacrolimus.

PP-1116

Establishment of a new transplant program in Kazakhstan: experience of 11 years

Mels Assykbay, Gani Kuttymuratov, Aiymkul Ashimkhanova, Yermakhan Assylkhanuly, Kakharman Yesmembetov, Saidkarim Abdugaffarov

JSC National Oncology & Transplant Center, Kazakhstan

INTRODUCTION: Kazakhstan as the one of the fast developing countries in Central Asia has been improving the development of organ transplantation since 2010. A high demand in organ donors among patients with end stage diseases (Table1) led to the adoption of organ transplant laws in 2011. There are 9 national and city level hospitals performing kidney, liver and heart transplantations in two major cities Almaty and Astana. A coordination center for organ transplantation was established in 2013 with the purpose of developing cadaveric donation service in Kazakhstan.

METHOD: Overall, 450 patients had undergone transplantations of kidneys, liver and heart for the last 3 years. The first kidney transplantation from a cadaveric donor performed in 1979, and this date considered as a beginning of the organ transplantation development in the Republic of Kazakhstan (RK). For the first time in our country, the multi-organ harvesting of organs: kidneys and the heart from cadaveric donor was performed in 2012.

RESULTS: The same year, the first pediatric liver transplantation from a living donor was carried out for a 6-year-old child. Starting from 2013 in collaboration with transplant surgeons from South Korea many hospitals started to develop living donor liver transplant programs The proportion of living donors was 91.3%; the remaining 8.7% was from cadaveric donors. The most prevalent cause of end stage liver disease (ESLD) among 58 liver recipients were due to viral hepatitis B and/or viral hepatitis C in 66%, primary biliary cirrhosis in 22%, and autoimmune hepatitis in 9%.

CONCLUSION: Our experience of Transplant program development highlights the demands of our population in organ donors with high mortality on a waiting list (72%). Thus, the development of living donor transplantation and overall transplant service will increase survival and quality of life of patients with end stage diseases.

PP-1117

Effects of tolvaptan in the early postopertive stage after living donor liver transplantation

Shunichi Imai[1], Masahiro Shinoda[1], Osamu Itano[1], Hideaki Obara[1], Minoru Kitago[1], Taizo Hibi[1], Yuta Abe[1], Hiroshi Yagi[1], Motohide Shimazu[2], Yuko Kitagawa[1]
[1]*Keio University, Japan*
[2]*Tamakyuryo Hospital, Japan*

INTRODUCTION: The vasopressin V2 receptor antagonist (tolvaptan) is a new diuretic that selectively promotes the excretion of water.We report the experience of tolvaptan usage in the postoperative management after living donor liver transplantation (LDLT).

METHOD: The subject of this study is recipients who underwent LDLT in Keio University Hospital (Tokyo, Japan) in 2014 and 2015. We have used carperitide and furosemide for the purpose of postoperative fluid management until 2014. Since January 2015, we introduced tolvaptan in addition to the diuretics above. We compared parameters between the recipients who underwent LDLTand used carperitide and furosemide in 2014 (conventional diuretics group, n=11) and those who underwent LDLT and used tolvaptan in addition to carperitide and furosemide in 2015 (tolvaptan group, n=4).

RESULTS: There were no significant differences in preoperative demographic data between tolvaptan and conventional diuretics groups with the exception of the follow-up period after surgery. In the tolvaptan group, tolvaptan was initiated on postoperative day 1 at a dose of 3.75 or 7.5mg, which led to effective increase of urine output in 3 recipients. There were no adverse effects associated with tolvaptan; none of the patients showed hypernatremia or renal impairment. There were no significant differences of body weight increase, urine output, eGFR, and creatinine between the groups. The period of carperitide usage was significantly shorter in the tolvaptan group than in the conventional diuretics group (4.3 ± 3.2 vs 11.1 ± 6.6 days, $p<0.05$). Time to removal of central venous catheter was also significantly shorter in the tolvaptan group than in the conventional diuretics group (5.8 ± 3.2 vs 14.5 ± 7.6 days, $p<0.05$).

CONCLUSION: Tolvaptan was uneventfully used after LDLT. Usage of this new diuretics might be a safe and helpful option in the postoperative fluid management after LDLT.

PP-1124

Cases of paediatric living donor liver transplantation : the role of radiology in detection of complications after liver transplant

Damayanti Sekarsari, Sahat Matondang
Cipto Mangunkusumo Hospital -University of Indonesia, Indonesia

INTRODUCTION: Liver transplant procedure has been performed in pediatric and adult patients at Ciptomangunkusumo National Hospital since 2010. There are several potential complications that can be found specifically in pediatric patients. Radiologic examinations play important role in the early detection of these complications, which in turn may profoundly affect prognosis

METHOD: 6 patients were referred to the Radiology department for assessment of various immediate and late complications of living donor-related liver transplants in children.

RESULTS: We came across a variety of complications, including hematomas, post operative fluid collection, pocket abscess, liver infarcts, biliary leakage, biliary anastomose stricture, and rupture of hollow organs

CONCLUSION: Radiology plays an important role in diagnosis, follow up and management of liver transplant complications. Ultrasound and plain radiography are the first-line examinations, while intraoperative cholangiography, CT and MR are performed for follow up and or to confirm the diagnosis. A spectrum of various complications is presented, along with their radiographic features

PP-1125

Impact of genetic relation of the donor on the outcome of living donor liver transplantation. A single center experience

Mahmoud Ali, Ahmed Shehta, Mohammad Elshobary, Tarek Salah, Ahmad M Sultan, Amr Yassen, Ahmad Elghawalby, Omar Fathy, Mohamed Abdel Wahab
Gastroenterology Surgical Center, Mansoura University, Egypt

INTRODUCTION: Living donor liver transplantation (LDLT) is a valuable option for expanding donor pool, especially in localities where deceased organ harvesting is not allowed. In addition, rejection rates were found to be lower in LDLT, which is attributed to the fact that LDLT is usually performed between relatives. However, the impact of genetic relation on the outcome of LDLT hasn't been studied. In this study, we examined the difference in rejection rates between LDLT fromgenetically related (GR) donors and LDLT from genetically unrelated (GUR) donors.

METHOD: All cases that underwent LDLT during the period from May 2004 till May 2014 were included in the study. The study group was divided into 2 groups; LDLT from GR donors and LDLT from GUR donors.

RESULTS: Three-hundred and eight patients were included in the study; 212 from GR donors and 96 from GUR donors. HLA typing wasn't included in the workup for matching donors and recipients. GUR donors were wives (36; 11.7%), sons in law (7; 2.3%), brothers in law (12; 3.9%), sisters in law (1; 0.3%) and unrelated (38; 12.3%). The incidence of acute rejection in GR group was 17.4%, and in GUR group was 26.3% (p-value= 0.07). However, there was a significant difference in the incidence of chronic rejection between the 2 groups; 7% in GR group and 14.7% in GUR group (p-value= 0.03). In terms of overall survival, there was no significant difference between both groups.

CONCLUSION: Genetically related donors should be the first option in LDLT. However, in areas where only living donation is the only option available, LDLT from GUR donors should be considered given the comparable survival with LDLT from GR donors.

PP-1126

Successful management of HAT after LDLT in the city clinical hospital No.7

Farabi Stamkulov, Bolat Baymakhanov, Almat Chormanov, Mussa Sakhypov, Bibigul Ilyasova, Nurjan Birzhanbekov, Erbol Serikuli, Ayarbek Astai
City clinical hospital #7, Kazakhstan

INTRODUCTION: Reflect the possibility of surgical treatment and angiographic thrombolysis techniques of complications in postoperative period after orthotopic liver transplantation in city hospital of Almaty city.

METHOD: We performed 15 living related orthotopic liver transplantation and 1 cadaver liver transplantation. The sixth liver transplantation in post-transplant period had complicated course.

Patient was 51years female with decompensated chronic liver disease secondary to overlap syndrome with CTP score of 10 and MELD score of 15, hypothyroidism and diabetes mellitus.

POD-4vascular doppler ultrasoundof hepatic vessels, the arterial blood flow is absent. Thrombosis of hepatic arterial anastomosis was confirmed by CTA. Surgical thrombectomy was done and graft was revascularised with right gastroepiploic artery. Postoperatively the patient was heparinised.

On POD 6 patient developed hemorrhage which was evident as hemorrhagic drains and fall in hemoglobin. Hence heparin was stopped and low platelets were corrected with platelet transfusion.

This led to the thrombosis of hepatic artery again on POD 7. This time patient was submitted for angiographic thromboilysis and hepatica artery was successfully revascularised. Post procedure patient was heparinised again.

However on POD-9 patient again developed hemorrhage

in the abdominal drains. This was once again managed by stopping the heparin and correcting the platelets. Within 6 hrs of stopping the heparin again developed recurrent HAT. The patient was again managed with angiographic thrombolysis with the restoration of blood flow in the hepatic artery. The procedure was successful and uneventful.

RESULTS: As a result of ongoing timely correction of thrombo-hemorrhagic complications, the patient was discharged home on 35-th day on outpatient treatment and observation of the transplant surgeon in city clinical hospital №7.

CONCLUSION: Early detection and treatment of complications in posttransplant period plays an important role in the successful outcome of liver transplantation.

PP-1131

200 A-P criteria for indication of liver transplantation for hepatocellular carcinoma

Kwangho Yang, Hyunyong Lee, Byunghyun Choi, Youngmok Park, Jeho Ryu, Chongwoo Chu
Pusan National University Yangsan Hospital, Korea

INTRODUCTION: Currently, the Milan criteria are widely adopted as an indication of liver transplantation (LT) for hepatocellular carcinoma (HCC). However, even if the patients met Milan criteria, there is 15-20% possibility of HCC recurrence. In this study, we tried to find out the new selection criteria of LT for HCC patients by analyzing our data.

METHOD: We retrospectively reviewed 88 HCC patients who underwent LT in Pusan National University Yangsan Hospital from May 2010 to December 2014. Risk factors of HCC recurrence were analyzed and overall survival rate and disease free survival rate were identified according to each risk factor.

RESULTS: Of 88 patients, 59 cases were within Milan criteria and 29 cases were beyond Milan criteria. 1 and 3 year overall survival rate (OS) was 93.1% and 89%, respectively and 1 and 3 disease free survival rate (DFS) was 87.7 % and 77%, respectively. HCC recurrence occurred to 17 patients (19%). In univariate analysis, tumor size>5cm, alfa-fetoprotein (AFP)>200ng/mL, protein induced by vitamin K absence or antagonism factor II (PIVKA II)>200mAu/mL, macrovascular invasion, microvascular invasion, beyond Milan criteria, and positive sign in positron emission tomography were identified as risk factor of HCC recurrence. In multivariate analysis, AFP>200ng/mL, PIVKA II>200mAu/mL, and microvascular invasion were independent risk factors associated with HCC recurrence. From these results, we defined a situation such as AFP≤200 ng/mL and PIVKA II≤200 mAu/mL as 200 A-P criteria. 3 year OS of the patients who met 200 A-P criteria (AP+ group) and the patients who did not meet 200 A-P criteria (AP- group) was 89.2% and 80.0%, respectively (P=0.787). 3 year DFS of AP+ group and AP- group was 89.9% and 43.1%, respectively and there was significant difference between two groups (P<0.001).

CONCLUSION: Tumor biologic factors such as AFP and PIVKA II should be considered prior to performing LT for HCC patients.

PP-1132

Donor safety in adult living donor liver transplantation: Single center experience in Algeria.

Kamel Bentabak[1], Mohcen Wahib Boubnider[1], Karim Boudjema[2], Nabil Debzi[3], Sid-Ahmed Faraoun[4], Brahim Griene[4], Mohamed Lakehal[2], Dalila Benmoussa[4], Nadia Fellah[4], Abdelaziz Graba[1]
[1]*Pierre and Marie Curie Center, Algiers, Algeria*
[2]*CHU Rennes, France*
[3]*CHU Mustapha, Algiers, Algeria*
[4]*Pierre and Marie Curie Center, Algiers, Algeria*

INTRODUCTION: In the absence of cadaveric grafts, an adult living donor liver transplant (LTLD) program was started in Algeria. The aim of this study is to evaluate complications of donors in LDLT.

METHOD: We analyzed retrospectively 34 living donor liver resections performed from February 2003 to January 2013. They were 19 females and 15 males, with a mean age of 26 years (18 to 58) and a mean remnant liver volume to body weight ration of 0,8 (0,7-1,5). Right hepatectomy was performed in 32 patients, left hepatectomy in 1 patient and in 1 case the procedure was aborted. The mean hospital stay was 19 days (11-33) and the follow-up ranged from 32 to 150 months. Complications were stratified according to Clavien's system. In this study, grade I and II were considered minor complications and grade III and IV major complications.

RESULTS: There were no mortality. In the immediate postoperative period, 26 complications were recognized in 16 donors (47%). Complications were scored as grade I in 6 cases (23%), grade II in 13 cases (50%), grade IIIa in 3 cases (11,5%), grade IIIb in 3 cases (11,5%) and grade IV in 1 case (4%). They were minor in 19 cases (73%) and major in 7 cases (27%). These major complications were encountered in 5 donors (15%). The 34 donors are alive without any late complications.

CONCLUSION: In our experience, liver resection in adult LTLD can be performed safely with minimal risk in cases of careful donor selection. Major complications occurred in 15% in our series. These results encourage us to continue our program.

PP-1133

Rituximab only protocol for ABO incompatible living donor liver transplantation without antibody removal

Seung Duk Lee, Seong Hoon Kim, Hyung-Min Park
National Cancer Center, Korea

INTRODUCTION: The number of ABO incompatible (ABO-I) living donor liver transplantation (LDLT) has been increased with various strategies. However, the optimal and simple method to overcome antibody-mediated rejection (AMR) has not been well known.

METHOD: From March 2014 to June 2015, 23 consecutive ABO-I LDLT were identified at National Cancer Center, Republic of Korea. Our protocol for ABO-I LDLT involved rituximab (300 mg/m^2) at preoperative 1 week, basiliximab (20 mg on operation day and postoperative day 4), and routine surgical procedure without plasma exchange before transplantation.

RESULTS: The 23 patients (13 males, 10 females) who underwent transplantation comprised liver cirrhosis (n=5, 2 HBV, 1 HCV, 1 NBNC, 1 Wilson`s disease), hepatocellular carcinoma (n=17, 14 HBV, 3 NBNC). Mean age, MELD score, and graft-to-recipient weight ratio of these patients was 53.1 years, 16.9, and 0.97, respectively. The median isoagglutinin antibody titer was 1:16 (range, 1:8 – 1:64). All patients are alive without graft failure except one patient who died of viral pneumonia at postoperative 2 months. There was no hyperacute rejection and antibody-mediated rejection. Mean duration of hospital stay was 14.6 days. There was no recurrence of hepatitis B virus and 9 positive antigenemia (39.1%) after transplantation. Complications included hepatic artery thrombosis in two patients, two extrahepatic biliary strictures, and one HCC recurrence.

CONCLUSION: Only rituximab ABO-I LDLT protocol without plasma exchange showed good graft outcomes without hyperacute rejection and AMR. This protocol seems to be a simple and effective modality for ABO-I LDLT.

PP-1134

Analysis of the liver volumes of korean adults using Dr. Liver

Jae Do Yang, Hee Chul Yu, Sung Woo Ahn, Oh Hyun Park, Baik Hwan Cho
Chonbuk National University Hospital, Korea

INTRODUCTION: The accurate standard liver volume (SLV) estimation is vital at the preoperative stage to assess the adequacies of graft size in LDLT and remnant liver in

major hepatectomy. SLV estimation formulas have been developed using height, weight, and liver volume measured by computed tomography (CT) or postmortem examination from cohorts varied in race, ethnicity, and gender ratio. The present study is to develop SLV estimation formulas for Korean adults using liver volume data measured by CT volumetry and compare their performances with those of existing formulas.

METHOD: Biometric data were collected at Chonbuk National University Hospital including body height (BH) and body weight (BW) measured by a stadiometer, skeletal muscle mass (SMM), body fat mass (BFM), body fat percentage (BFP), and waist hip ratio (WHR) measured by a body composition analyzer, and total liver volume (TLV) analyzed by Dr. Liver for abdominal CT data. Excluded cases with hepatic lesions and liver cirrhosis, a gender-balanced, age-matched dataset of 220 cases in 30s to 70s of age was formed for statistical analysis.

RESULTS: Two regression models were proposed by considering biological significance as well as statistical significance in estimating SLV: TLV = 117 + 15.8 × BW (adjusted R2 = 0.527) and 237 + 15.7 × BW - 4.15 × BFP (adjusted R2 = 0.541). An error analysis of TLV estimation showed that the average error ratios (%) of the two proposed formulas ranged 11.5 to 11.7 (SD = 9.4 to 9.6), similar estimation performance could be observed in existing formulas from Asian cohorts based on CT volumetry, and quite different performance for those from Western cohorts based on postmortem examination.

CONCLUSION: Further research is needed to develop better validated formulas for Korean adults by including data from other medical centers, forming a larger dataset balanced by age as well gender, and using prospective cases.

PP-1136

Prognostic factors predicting fatal outcome after living donor liver transplantation for fulminant hepatic failure

Tae-Seok Kim[1], Jong Man Kim[2], Choon Hyuck Kwon[2], Sung-Joo Kim[2], Jae-Won Joh[2], Suk-koo Lee[2]
[1]*Keimyung University Dongsan Hospital, Korea*
[2]*Sungkyunkwan University, School of Medicine, Korea*

INTRODUCTION: Liver transplantation (LT) is the only life-saving treatment in irreversible fulminant hepatic failure (FHF). However, not all the patients with fulminant hepatic failure can receive LT due to organ shortage. For such a reason, living donor liver transplantation (LDLT) has been accepted as feasible treatment for fulminant hepatic failure although has generated several debatable issues. In this study, we investigated the prognostic factors predicting fatal outcome after LDLT for FHF.

METHOD: From April 1999 to April 2011, 60 patients underwent LT for acute liver failure, including 42 patients for FHF at Samsung Medical Center, Seoul, Korea. Among 42 patients, 30 patients underwent LDLT for FHF and database of these patients was analyzed retrospectively to investigate the prognostic factors after LDLT for FHF.

RESULTS: Among 30 patients, 7 patients (23%) died during in-hospital period within 6 months and 23 patients (77%) survived until recently. In univariate analyses using Cox proportional hazards model, donor age (>35 years), graft volume (GV) / standard liver volume (SLV) (<50 %), cold ischemic time (>120 min), hepatic encephalopathy (grade IV), hepatorenal syndrome and history of ventilator care were associated with fatal outcome after LDLT for FHF. In multivariate Cox proportional hazards analyses, Hepatorenal syndrome, GV/SLV (<50 %) and donor age (>35 years) were significantly associated with fatal outcome. Although the statistical significance was not shown in this analysis (p=0.059), hepatic encephalopathy grade IV also seems to be a risk factor predicting fatal outcome.

CONCLUSION: The survival of patients with FHF undergoing LDLT was comparable to published data. In LDLT in patients with FHF, Hepatorenal syndrome, Graft volume under 50% of standard liver volume and donor age over 35 years are the independent poor prognostic factors. To confirm this result, further studies with a large sample size is required.

PP-1137

The role of pretransplant therapy for hepatocellular carcinoma in a living donor liver transplantation program

Taizo Hibi[1], Masahiro Shinoda[1], Osamu Itano[1], Minoru Kitago[1], Yuta Abe[1], Hiroshi Yagi[1], Hideaki Obara[1], Kentaro Matsubara[1], Motohide Shimazu[2], Yuko Kitagawa[1]
[1]*Keio University School of Medicine, Japan*
[2]*Tamakyuryo Hospital, Japan*

INTRODUCTION: The role of down-staging/bridge therapy for cirrhotic patients with hepatocellular carcinoma (HCC) exceeding/within Milan criteria before living donor liver transplantation (LDLT) has yet to be defined.
METHOD: A single-center, retrospective cohort study was conducted on 32 cirrhotic patients with HCC who underwent LDLT from 2000 through 2013. Dynamic three-phase computed tomography (CT) images at initial presentation and just before LDLT were checked whether they met Milan criteria. Final histopathological findings were also reviewed. HCC recurrence and overall survival rates were compared according to tumor status.
RESULTS: Median age, 54 (40-63) years; male: female=26:6. The most common etiology was hepatitis B/C (n=26). At initial presentation, 9 patients were beyond Milan criteria. Overall, 21 patients underwent pretransplant HCC treatment (bridge therapy, n=13; down-staging, n=8). Transcatheter arterial chemoembolization was the most common modality used (n=9). Of 9 patients beyond Milan criteria, 3 were successfully down-staged, making 6 patients still exceeding Milan criteria at transplant (maximum size, 5 cm; number, 14). Posttransplant histopathological exploration unveiled 13 more patients not meeting Milan criteria microscopically. Overall 5-year survival rate for HCC patients was 72% and equivalent to other indications (78%, p=0.25). Six patients beyond Milan criteria demonstrated significantly worse 5-year recurrence-free and overall survival rates of 50% and 17%, respectively, compared to those within Milan criteria (100% and 75%; n=26). HCC recurrence was observed in 3 patients (all beyond Milan criteria) and they died of disease at 13, 24, and 49 months after transplant.
CONCLUSION: Successful down-staging therapy provides similar outcomes compared with patients within Milan criteria radiologically, regardless of histopathological findings. The role of bridge therapy warrants further investigation.

PP-1140

Unexpected thrombotic occlusion of splenorenal shunt after ligation of left renal vein in LDLT

Young Seok Han, Jae Min Chun, Young Yeon Choi, Heon Tak Ha, Dae Young Jun
Kyungpook National University School of Medicine, Korea

INTRODUCTION: In order to prevent the steal of portal flow and insufficient portal flow after liver transplantation, a large spontaneous spleno-renal shunt (SRS) should be treated. Among the various techniques for this purpose, left renal vein ligation (LRVL) is regarded as one of the most effective procedure for restoring the adequate portal flow without significant impact on renal function. Becuase renal venous flow can be drained into the large SRS after LRVL, the impact on renal function is minimal. However, if the occlusion of large SRS happens, the influence of renal function still remains unknown.
METHOD: We performed LDLT for a female recipient with poral vein stenosis and a large SRS.
RESULTS: The restoration of an adequate portal inflow was confirmed after LRVL on operative field. Two weeks after transplantation, the unexpected thrombotic occlusion of left renal vein and SRS were identified on the contrast-enhanced abdominal computed tomography and the left renal vein flow was drained into her left ovarian vein. Fortunately, her renal and liverfunction testwaswithin noral range.

CONCLUSION: Conclusively, LRVL didn't have an adverse effect on renal function in our case. But, enough discussion will be necessary for the clinical significance of this unexpected thrombotic event, which was developed after LRVL.

PP-1143

Real-life effectiveness of different antiviral therapy regimens in treatment of hdv-infection

Kakharman Yesmembetov[1], Dzhamal Abdurakhmanov[2], Nikolay Mukhin[2]
[1]*National Scientific Center for oncology and transplantation, Kazakhstan*
[2]*E.M.Tareyev clinic, I.M.Sechenov First Moscow State Medical University, Russia*

INTRODUCTION: HDV is a defective RNA virus, which requires HBV for transmission and replication, causing the most severe type of viral hepatitis infection in humans. We aimed to assess the real-life efficacy of different IFN-α regimens in patients with HDV-infection.
METHOD: 102 patients with serological markers of HDV-infection, followed-up from Jan 2002 to Jan 2011 in the hepatology department of the E.M.Tareyev clinic, I.M.Sechenov First Moscow State Medical University, were included in the study.
RESULTS: Out of 102 patients (mean age 39 years, male 57.8%) with HDV-infection, only 49 (48%) were eligible for treatment with IFN-α. 40 (39,2%) patients (male 26, mean age 35,8 years, mean BMI 23,7), which have completed at least 26 weeks of treatment with IFN-α were included in the analysis. 7 (17,5%) out of 40 patients were treated with human leukocyte Interferon-α (HuIFN-α-Le) 1,5-6 MU daily for 24-48 weeks. Sustained ALT normalization (SBR) was achieved in 3 (42,9%) patients, none SVR. 16 patients were treated with either IFN-α2a or IFN-α2b 3MU thrice weekly or 5MU daily for 24-72 weeks. 31,3% had SBR, 25% achieved SVR. 20 patients were treated with PEG-IFN-α2a/PEG-IFN-α2b for 24-108 weeks, with 40% achieving SBR, SVR in 25%. Majority of patients who achieved SVR were young and had chronic hepatitis stage.
CONCLUSION: PEG-IFN-α2 remains the most effective antiviral agent for HDV-infection, providing SBR and SVR in 40% and 25% of the patients, respectively. Rate of antiviral response was dependant on disease stage with the most prominent SVR rates achieved in chronic hepatitis patients.

PP-1144

X-ray endovascular intervention in portal hypertension

Adilbek Mukazhanov, Sergey Borovskiy, Assan Zheksembayev, Zhasulan Aysin, Bauyrzhan Ibrayev, Aynetta Nurmagambetova
National Scientific Center for oncology and transplantation, Kazakhstan

INTRODUCTION: to evaluate portal hypertension's (PH) treatment results of various etiologies by x-ray endovascular interventions.
METHOD: 99 patients with PH were observed. The cause of PH in 91 (91.9%) of patients was liver cirrhosis, 7 (7.1%) patients had PVT and cavernous transformation of the PV. Mean age of patients was 56.7 years (range 16-78), women 53 (53.5%). All patients have undergone PV Doppler US before intervention. Endovascular intervention was held in the following order: celiac/mesenteric arteriography, embolization of the splenic artery and gastric arteries, portography via percutaneous transhepatic access, venous embolization of stomach, esophageal varices, control portography, catheter removal and sealing punctual channel in the liver. 150 x-ray endovascular interventions were performed: 114 (76.0%) splenic artery embolization, 30 (20.0%) stomach and esophageal varices embolization, 4 (2.7%) gastric artery embolization, 2 (1.3%) TIPS. Repeated interventional procedures were performed in 15 (15.2%) patients. The average rate of repeated x-ray endovascular

intervention was conducted in 60±5 days.

RESULTS: complications were observed in 4 patients (4.1%): 3 (3.1%) after splenic artery embolization developed splenic infarction, in one case splenectomy performed due to the development of splenic abscess., 1 (1.0%) case bleeding was observed from the puncture site of the liver, which was stopped laparoscopically. Death was reported in 3 (3.1%) cases, 2 of them - from the liver-kidney failure, 1 - from PE. Subjective improvement noted most of patients. Recurrent esophageal bleeding in hospital was not reported. According to the control endoscopy 32 (32.3%) of patients had transition from esophageal III-IV level to I-II level, in 3 (3.1%) patients esophageal varices were not observed.

CONCLUSION: X-ray endovascular interventions can be considered as a method for the treatment and prevention of bleeding from esophageal and gastric varices in PH. Conducting x-ray endovascular interventions improves the quality and duration of life for patients with PH.

PP-1145

The results of transarterial chemoembolization for malignant liver tumors

Assan Zheksembayev, Sergey Borovskiy,
Nasrulla Shanazarov, Adilbek Mukazhanov, Altay Kerimkulov
National Scientific Center for oncology and transplantation, Kazakhstan

INTRODUCTION: to assess TACE results in our center.

METHOD: 44 TACE to 38 patients with unresectable malignant liver lesions were analysed. Mean age 65.1 years (range 42-83), women 24. All patients had histological confirmed cancer: 25 (65.8%) - HCC 19 (76%), cholangiocarcinoma 3 (12%), mixed (gepatoholangiocarcinoma) 1 (4%), angiosarcoma 1 (4%), malignant mezenhimoma 1 (4%), metastatic cancers 13 (34.2%). Oily chemoembolization was performed in 3 cases (7.9%), microspheres embolization in 35 cases (92.1%). TACE of the right hepatic artery is performed in 21 cases (55.3%), the left – 18 (47.4%), general – 8 (21.1%). TACE was used in combination with systemic chemotherapy (SHT) among 22 (57.9%), with Hi-FU ablation in 4 cases (10.5%). Patients have received the number of courses as follows: 1 (2/6%) – 5 courses; 2 (5.3%) – 4; 3 (7.9%) – 3 and 7 (18.4%) – 2. On average, repeated TACE treatments were held in 39±8 days.

RESULTS: Technically TACE was successful in 100 % of cases. Hyperthermia and heaviness in the right upper quadrant were observed in 6 cases (15.8%). Duration of hyperthermia ranged from 2 to 4 days. Complication observed in 1 case (2.6%) – subcutaneous hematoma on the hip. Most of patients noted subjective improvement – 78%. By RESIST system 9 (23.7%) patients had a partial regression, stable disease – 26 (68.4%) and progression of the disease in 3 cases (7.9%). During the reporting period 2 patients died due to the progression of the disease and distant metastasis. Other patients are still under observation.

CONCLUSION: TACE can be considered as a stage of complex treatment and also as a selection method for patients with contraindications to the SHT in inoperable primary and metastatic liver cancer. TACE significantly improves the quality and life expectancy of patients with inoperable malignant tumors of the liver.

PP-1147

Liver regeneration kinetics in donor and recipients after living donor liver transplant

Shailesh Sable[1], Sharad Maheshwari[5], Kapildev Yadav[7], Barun Nath[6], Vibha Varma[4], Sorabh Kapoor[3], Vinay Kumaran[2]
[1]Ms, Dnb (Gen.surg.), Dnb (Surgical Gastroenterology) Associate Consultant, Unit of Liver Transplant & Hpb Surgery, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India
[2]Ms Mch. Head-Unit of Liver Transplant & Hpb Surgery, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India
[3]Ms, Mch. Consultant- Unit of Liver Transplant & Hpb Surgery, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India
[4]Ms,Dnb (Gen.surg.),Dnb (Surgical Gastroenterology), Mrcsed, Consultant-Unit of Liver Transplant & Hpb Surgery, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India

[5]*Md. Consultant Radiologist, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India*
[6]*Ms. Consultant- Unit of Liver Transplant & Hpb Surgery, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India*
[7]*Ms. Clinical Associate, Unit of Liver Transplant & Hpb Surgery, Kokilaben Dhirubhai Ambani Hospital, Mumbai, India, India*

INTRODUCTION: Liver regeneration is very crucial in living donor liver transplant (LDLT) for both donor and recipient. Data on regeneration kinetics following liver transplant is very scarce. We have attempted to look into liver regeneration kinetics following donor hepatectomy (remnant) and in recipients (graft) after LDLT.

METHOD: Between March 2013 and August 2015, 95 living donor liver transplants were performed. Twelve donors and 20 recipients underwent Triphasic CT abdomen for various clinical indications at different time frames (Non-Protocol based). Liver volumes were calculated using Myrian (R) XP-intrasense1.18.0 software and compared with pre transplant remnant volume in donors and Graft volume in recipients. The percentage growth in graft as well as remnant were calculated using the formula (Volume Growth% = Difference in growth volume/Original remnant or graft volume multiplied by 100).

RESULTS: Total 12 donors underwent CT scans between 7 days and 239 days following donor hepatectomy. The volume growth percentage estimated were in the range of 42% to 304% for remnant, and the absolute volume increase was in the range of 646cc to 1249cc. Liver regeneration volumes in donor in first 2 weeks were 147%,116%, 183% 112%, and 106% at 11,7,14,10 and 10days respectively. Twenty recipients underwent 29 CT scan studies between 3 days to 273 days post LDLT. Volume growth percentage estimated were in the range of 11% to 155%, and absolute volume increase were in the range of 35cc to 943cc.Recipients regeneration volumes in 2 to 4weeks periods were 93%,87%,108%,110%,111% and 114% on18,23,23,28,11 and 18 days respectively.

CONCLUSION: Liver regeneration is very rapid in donor, remnant volumes doubles as early as first 2 weeks whereas in recipient graft volumes almost doubles in 2 to 4 weeks.

PP-1148

Liver fetal cell therapy as a promising approach for patients with end-stage liver disease on the waiting list

Akhmet Seidakhmetov, Marlen Doskali, Samat Saparbayev, Venera Rakhmetova, Ainur Doszhan, Zhannat Taubaldiyeva, Abay Baigenzhin, Zhaksylyk Doskaliyev
JSC National Scientific Medical Research Center, Kazakhstan

INTRODUCTION: The liver transplantation procedure currently has no alternative therapeutic option for patients with end stage liver disease, but it is still remains limited because of the difference in the number between transplant candidates and available organs. The development of novel treatment options could have a significant clinical impact for patients on the waiting list.

METHOD: In recent studies it is shown that cell therapy using human fetal liver-derived stem cells can provide great potential to conservatively manage end-stage liver diseases and serve as a supportive therapy in the management of liver diseases.Our study aimed to prove the efficacy of human fetal liver-derived stem cell transplantation in such patients.

RESULTS: Human fetal liver-derived stem cells were intravenously injected to 10 patients with severe stages of liver cirrhosis. We established a new mode of cell therapy introduction to patients which is safely and selectively can attain to the damaged liver.

CONCLUSION: Our results showed clinical improvement in terms of all clinical and biochemical parameters. In fact, even after 2 months follow-up in all patients we found significant reduction in means of MELD and CTP scores. Thus, our study presents what we believe to be a novel paradigm for the application liver-derived stem cell therapy in patients with severe stages of liver cirrhosis on the waiting list.

PP-1150

The role of international collaborative program in development of adult-to-adult living-donor liver transplantation program in National Scientific Medical Research Center

Marlen Doskali, Myltykbay Rysmakhanov, Jamilya Saparbay, Aliya Taganova, Aibolat Doskaliyev, Aidos Kulmaganbetov, Akhmet Seidakhmetov, Abay Baigenzhin, Zhaksylyk Doskaliyev
National Scientific Medical Research Center, Kazakhstan

INTRODUCTION: Living donor liver transplantation (LDLT) from adult to adult has become a standard and effective treatment method and has being increasingly performed for patients with end stage liver disease. In our study we present the collaborative work experience of LDLT program development under the support of colleagues from experienced centers in National Scientific Medical Research Center during two years.

METHOD: From January 2013 to February 2015, 12 LDLTs were performed in our center with the support and under the guidance of Seoul National University Hospital (SNUH). Operation procedures were performed by standard methods in donor and recipients. In all donors right hepatectomies were performed.

RESULTS: At a median follow up of 2 years, both the patient and graft survival were 92%. The main causes of transplantation were primary biliary cirrhosis (50%), viral hepatitis (30%) and other liver diseases. The median age of the recipients at the time of LDLT was 43.9±17.2 (19-65 years). Recipients average hospital stay was 30±5 days (23-38 days, median 30 days) found. Vascular and biliary complications were the leading cause of reoperation, graft loss and retransplantation. Postoperatively, these recipients were started on a triple therapy immunosupression. We have not seen any early or late surgical complications in donors.

CONCLUSION: In conclusion, collaborative work with SNUH gives opportunity to increase the development of management in liver transplantation to achieve the own strategy of LDLT program.

PP-1151

Impact of malignancy on survival after liver and kidney transplant patients: Dalin tzu chi hospital experience

Wen-Yao Yin
Dalin Tzu Chi General Hospital, Taiwan

INTRODUCTION: Death from cardiovascular disease and infection are both decreasing in frequency. Cancer, on the other hand, is poorly and expensively screened both in recipient and donor to prevent post-transplant malignancy

METHOD: We review all liver and kidney transplant patients in Dalin Tzu Chi General hospital in the past twelve years.

RESULTS: There were 36 liver transplant and 44 kidney transplant patients with a total of 80 cases in this study. Thirteen cases (17.5%) were associated with different types of malignancy.

Among the liver transplant patients, 5 cases of living donor liver transplant (LDLT) and 4 cases of deceased donor liver transplant (DDLT) patients were associated with malignancy. Two of the 4 LDLT cases with hepatocellular carcinoma (HCC) were incidentally found in explanted liver and the other two were treated before transplant. No recurrence follow up of 2 months to 7 years. However, a small cecal cancer was unfortunately detected one month after LDLT and laparoscopic radical right hemicolectomy was performed and died of distant metastases after one year. Two HCC, one prostate cancer, and one nasopharyngeal cancer (NPC)were noted in DDLT. Both of the HCC patients died of local and distant metastasis 3 months and 3 years after transplantation respectively. A case with NPC, underwent surgery with chemo-radiation and a prostate cancer case, treated non-surgically, are well now

A total of 5 cases had malignancy in kidney transplant (KT) patients : one Renal cell carcinoma (RCC), three Transitional cell carcinoma (TCC) and one Colon cancer. Two TCC cases

were de novo malignancy and the remaining cases received treatment of cancer before transplant. One TCC died of recurrence and distant metastasis. No definite cancer was seen in all 7 LDKT.

CONCLUSION: Preoperative careful screening is fundamental to prevent overlook occult cancer. Close follow up and appropriate immunosuppressant treatment may give an excellent result

PP-1152

Dual hepatic artery reconstruction in living donor liver transplantation

Siddachari Ravichand Chamarajanagar
Manipal Hospitals, Old airport road, HAL, Bangalore, India

INTRODUCTION: Ideal donor is not always available in living donor liver transplants (LDLT). LDLT is technically challenging and selection of a donor depends on multiple factors and anatomical feasibility is one of them. Dual arterial anastomosis is one of the challenging issues in LDLT but can be safely performed although technically challenging. This study was done to analyse the outcome of patients with dual artery grafts.

METHOD: We retrospectively analysed all LDLT patients performed from 2006 to July 2014. Total number of LDLTs performed was 1408. Adult patients were 1296 and paediatric patients 112. Of the 1408 patients 45 (3.19%) patients had dual arterial anastomoses. Adverse vascular events were recorded both during and after the surgery. Protocol doppler and CT liver angiogram were done in all after surgery.

RESULTS: The male to female ratio was 4.7:1. Median age in adults was 49 years and in paediatrics it was 4 years. Of the 45 patients who underwent dual artery anastomosis only one was a paediatric patient. Average diameter of single artery donor was 2.8 mm (range 1.6 to 3.4 mm) and 1.7mm (range 1.6 to 2 mm) in dual artery donors. Hepatic artery was redone in one of the two arteries in two patients intraoperatively. Postoperatively, doppler signal could not be appreciated in one of the two arteries in 3 patients. However they did not require any intervention as the LFTs were normal. Overall incidence of hepatic artery thrombosis (HAT) was 17 (1.2%), 14 were in adults (1%) and 3 (2.6%) in paediatric patients. Grafts with single artery required intervention for HAT but none of the grafts with dual artery required intervention.

CONCLUSION: Dual artery grafts although are technically challenging in LDLT have good outcome and such donors shouldn't be rejected.

PP-1156

Experience with different embolic agents in the treatment of tumors of hepatopancreatoduodenal area

Chokhan Aitbayev, Nasrulla Shanazarov, Irina Ten, Sergey Borovskiy
National Scientific Center for oncology and transplantology, Kazakhstan

INTRODUCTION: Rate particular application and the overall effectiveness of the various funds in the endovascular embolization treatment of tumors hepatopancreatoduodenal zone.

METHOD: Results of treatment of 72 patients with unresectable primary and metastatic tumors hepatopancreatoduodenal zone are given in the article. Of these, 48 patients with liver tumors were identified hepatocellular carcinoma, in 21 cases colorectal cancer metastases to the liver, in 3 cases - tumors of the pancreatic head. Repeated chemoembolization of the respective artery using doxorubicine, irinotecan, gemcitabine in a mixture with oil microspheres Contour (Boston scientific), loaded with microspheres HepaSphere (Biosphere Medical), DC bead (Terumo) were used.

RESULTS: Intrahepatic tumors decrease or stabilization was achieved after chemoembolization in 88.6% of

cases. On average, survival of patients was 22 months. Chemoembolization was more effective in patients with hypervascular formations. Of the 3 patients with tumors of the pancreatic head, subjected to chemoembolization, one patient died after 6 months. 2 patients were alive with a follow 4 to 6 months.

CONCLUSION: Thus, endovascular interventions are an effective method of palliative treatment for unresectable malignant tumors hepatopancreatoduodenal areas can significantly improve long-term outcomes of these patients.

PP-1157

The correlation between pre-operative volumetry and real graft weight: comparison of two volumetry programs.

Nadiar Mussin, Kwang-Woong Lee, Adianto N., Hyeyoung Kim, Hyoshin Kim, Nam-Joon Yi, Sai A.N. Oo, Assylkhanuly Ye., Kyung-Suk Suh
Seoul National University Hospital, Korea

INTRODUCTION: Accurate pre-operative assessment of graft volume is important for donor safety and recipient outcome. Nowadays, there are several clinically available volumetry programs. There has been not so much report to the accuracy of each programs. In this study, we evaluated the accuracy of two volumetry programs compared with real graft weight.

METHOD: From October of 2013 to August of 2015, there were performed 274 cases of right living donor liver transplantation in SNUH, Seoul, Korea. Among them, 209 patients in whom both preoperative volumetry data and real graft weight information were available were included in this study. We had used 'Rapidia®' until April of 2014, and then 'DrLiver®' has been exclusively used. 101 patients belonged to Rapidia®' group and another 108 patients belonged to Dr. liver group. Real graft weight was measured during bench surgery. The difference between volumetry and real weight was graded into minimal difference (≤10%) and big difference (>10%). We compared the correlation coefficient and degree of difference between two different programs.

RESULTS: The correlation coefficients of 'Rapidia®' (0.836) was lower than that of 'DrLiver®' (0.868). The cases measured by 'Rapidia®' showed minimal difference in 39 cases (38.6%) and big difference in 62 cases (61.4%). However, the cases measured by 'DrLiver®' showed minimal difference in 59 (54.6%) cases and big difference in 49 (45.4%). 'DrLiver®' showed significantly more minimal difference than 'Rapidia®' (p=0.026).

CONCLUSION: Comparing the results of both programs, 'DrLiver®' showed better correlation with real graft weight than 'Rapidia®'. It may be related with the difference of measurement methods between two programs. More precise method to predict real graft weight should be investigated.

PP-1158

Estimation of fat by MR in donors of living donor liver transplantation

Guruprasad Shetty[1], Ashlesha Udare[2], Rashmi Badhe[2], Somnath Chattopadhyay[2], Gaurav Chaubal[2], Upasna Bahure[2], Samir Shah[2], Parijat Gupte[2], Aakash Shukla[2], Mihir Vohra[2]
[1]*Surgical Gastroenterologist, India*
[2]*Global Hospitals Mumbai, India*

INTRODUCTION: Estimation of liver fat is important for selecting donors for living donor liver transplantation. Biopsy can accurately estimate liver steatosis, but is invasive and is not without complications. MR is inherently sensitive to lipid deposition and has the ability to directly exploit differences in water and lipid resonance. The aim of this study was to assess the accuracy in estimating Steatosis in livers of donors for living donor liver transplantation.

METHOD: Data of donors for living donor liver transplantation was retrospectively analysed from a prospectively

maintained database. MR Elastography using Elasto MR touch technique by GE 3 Tesla machine and MR fat estimation using Ideal IQ technique was performed in all donors. All donors underwent an intra operative liver biopsy. Demographic data, MR Elastography and MR fat fraction data were collected. The MR fat fraction results were compared with the intra operative liver biopsy results.

RESULTS: From September 2014 to September 2015, 80 living donor liver transplants were performed. MR fat estimation and MR Elastography was done in the last 50 patients and the data was analysed. The mean age was 33.4 ± 9.6 years, mean BMI was 25.1 ± 3.1 Kg/m^2. Mean liver stiffness by MR Elastography was 2.2 ± 0.3 Kpa. Mean MR fat fraction was 4.1 ± 2.4 %. Mean fat percentage on liver biopsy was 3.8 ± 2.2 %.

CONCLUSION: There was good correlation between results of MR fat fraction estimation and fat seen on liver biopsy. MR is a useful technique to accurately estimate fat in donors for living donor liver transplantation.

PP-1159

Outcomes of treatment of acute liver failure due to yellow phosphorus poisoning

Ravi Mohanka[1], Guruprasad Shetty, Somnath Chattopadhyay, Gaurav Chaubal, Upasna Bahure, Samir Shah, Parijat Gupte, Aakash Shukla, Mihir Vohra, Vaishali Solao
Global Hospital Mumbai, India

INTRODUCTION: Acute liver failure (ALF) due to yellow phosphorus poisoning is a difficult problem to treat. Timing of liver transplantation and selection of patients remain the key. Early transplantation might be jeopardized by development of cardiac and bone marrow failure. Delaying liver transplantation for too long can cause irreversible multiple organ failure. The aim of this study was to identify patients having ALF who need liver transplantation and also the optimum timing of transplantation.

METHOD: Data of patients who had ALF was retrospectively collected. Demographic data, liver functions, ammonia and lactate at presentation,length of hospital stay,postoperative morbidity and mortality was collected.

RESULTS: From September 2014 to September 2015, 5 patients of acute liver failure due to yellow phosphorus poisoning were treated at our centre (4 females and 1 male). Mean age was 31.4 years.Out of these, one patient underwent a deceased donor liver transplant, one patient underwent a living donor liver transplantation whereas 3 patients were managed medically. Time to transplant from the time of encephalopathy was 4 days.Both patients who underwent liver transplantation survived. One patient in the medically managed group died due to cardiac failure before transplant could be done. In patients requiring liver transplantation the mean serum bilirubin was higher 9.4 vs 5.6 mg/dl than the patients who could be successfully managed medically. Also the duration of jaundice to encephalopathy was shorter 3.5 vs 7.5 days in patients who required liver transplantation. In the patient who died due to cardiac failure the duration between jaundice and encephalopathy was only 1 day.

CONCLUSION: Patients having hyperacute presentation after yellow phosphorus poisoning are likely to require a liver transplantation. These are also the group of patients who can manifest severe systemic toxicity. Emergency liver transplantation is useful as long as patient selection and timing are judicious.

PP-1160

Initial experiences in living donor liver transplantation at Astana city hospital No. 1

Abylay Donbay[1], Askar Esseyev[1], Suk-Won Suh[2], Hyeyoung Kim[2], Kwang-Woong Lee[2]
[1]*City Hospital #1, Astana, Kazakhstan*
[2]*Seoul National University Hospital, Korea*

INTRODUCTION: Liver transplantation is now standard of care therapy for patients with acute or chronic liver

disease where long term or short term patient survival is compromised. Unfortunately, the number of people who need liver transplantation are increasing much faster than the donor organs available. Because of the scarcity of cadaveric liver grafts, living donor liver transplantation (LDLT) has emerged as an alternative to cadaveric donor liver transplantation (CDLT). Aim: To report our initial experience in LDLT

METHOD: A case series of 11 patients underwent LDLT from January 2013..to March 2015 at Astana City Hospital No. 1, Kazakshstan.

RESULTS: From eleven patients, 70% were women and 30% were men. The average age
of recipients were 35 - 63 years old and donorswere28 -37 years old 70 % women. Donors mostly were first grade relatives of the recipients. Sixty-percent of recipients had a liver cirrhosis, 25% from chronic "B" and "D", and 15% "C". The MELD score of recipients were 15-25 with Child –Pugh 7-10.

CONCLUSION: LDLT can be done safely with good result with well trained Liver Team.

PP-2000

Risks and treatment strategies for de novo hepatitis B virus infection from anti-HBc-positive donors in pediatric living donor liver transplantation

Gao Wei, Dong Chong, Wang kai, Ma Nan, Sun Chao, Zheng Weiping, Shen Zhong-yang
Tianjin First Central Hospital, Transplantation Surgery, Tian Jin, China
Tianjin Key Laboratory of Organ Transplantation, Tian Jin, China

INTRODUCTION: The aims of this study were to analyze the incidence and risk factors of de novo hepatitis B virus (HBV) infection in pediatric patients receiving living donor liver transplants from hepatitis B virus core antibody-positive donors, and to explore its treatment strategies.

METHODS: The data of 105 pediatric recipients receiving living donor liver transplants and their donors in Tianjin First Central Hospital between September 2006 and December 2012 were retrospectively analyzed. After excluding four perioperative dead recipients, 101 were studied the HBV markers in the recipients and donors were regularly detected before and after the surgery, including hepatitis B surface antibody (HBsAb), hepatitis B surface antigen (HBsAg), hepatitis B e antigen, hepatitis B e
antibody (HBeAb), and hepatitis B core antibody (HBcAb). Hepatitis B DNA detection was performed in cases that were preoperatively HbcAb positive and suspicious of being infected with HBV after the surgery.

RESULTS: The median follow-up period was 25.6 months (range 4.0–102.8 months), during which eight cases (7.92%) were diagnosed with de novo HBV infection, and the mean time from liver transplantation to HBV infection was 11.4 months (range 3.5–18 months).Forty-four (43.6%) of the children received HBcAb-positive allografts, and 15.9% (7/44) had de novo hepatitis B infection after liver transplantation.

CONCLUSION: Hepatitis B virus core antibody-positive donors may significantly increase the chances of de novo HBV infection in HBsAg-negative pediatric patients receiving living donor liver transplants without preventive treatment. However, the incidence of de novo HBV infection may be reduced using appropriate treatment strategies.

PP-2001

The effect of living donor liver transplantation to patients with hepatic myelopathy

GUO Qing-jun, Jiang Wen-Tao, LI Jiang, Shen Zhong-yang
Tianjin First Central Hospital, China

INTRODUCTION: Hepatic myelopathy (HM) is a rare neurological complication of chronic liver disease, causing progressive spastic paraparesis. Commonly used therapeutic strategies for hepatic encephalopathy aiming

at the reduction of plasma ammonia levels such as protein restriction, oral neomycin, lactulose, or ornithine aspartate fail to improve the symptoms of hepatic myelopathy. Studies have been reported that the clinical symptoms and signs of patients with HM could be improved after orthotopic liver transplantation (OLT), however, due to the shortage of graft organs, living donor liver transplantation (LDLT) was conducted in some centers to treat HM. The aim of this study was to identify the role of LDLT in the treatment of HM.

METHODS: We present eight patients, who underwent LDLT at the early stage after progressive HM had been diagnosed, gaining definite improvement of their neurological status within a relatively short time. In addition, we review all ten similar cases that have hitherto been reported in English literature.

RESULTS: In all eight patients, the neurologic status improved significantly after liver transplantation. The grade of improvement was related to the time interval between onset of the first symptoms of hepatic myelopathy and liver transplantation.

CONCLUSION: Early recognition of hepatic myelopathy is important because timely liver transplantation as an established therapy for end-stage liver disease offers the chance of complete recovery from hepatic paraparesis.

PP-2002

Evaluation of donor safety and graft anatomic variations for right lobe living donor liver transplant

Jiang Wen-Tao, Li Jiang, Shen Zhong-yang
Tianjin First Central Hospital, China

INTRODUCTION: To analyze the anatomical variations of vascular and biliary structures in graft livers for living donor liver transplant (LDLT) and evaluate early postoperative donor security.

METHODS: 424 cases of LDLT were conducted in the hospital from January 2007 to December 2014, all clinical data of donors was retrospectively studied and full assessment was given on graft liver anatomy, selection criteria for donors, postoperative liver function recovery and early postoperative complication.

RESULTS: According to Nakamura grouping, hepatic veins were classified to three types: Type I 71.2%, type II 26.1%, III type 6.7%. Left hepatic vein (LHV) shared the same trunk with middle hepatic vein (MHV) in 297 cases (70.17%); The presence of veins with diameter larger than 5mm from segment V and segment III was found in 202 cases (47.8%); 125 cases (29.6%) had hepatic vein from segment IV importing to MHV, 15 cases (3.56 %) importing into LHV, the remaining 283 cases (66.8%) importing to both LHV and MHV; Accessory right inferior hepatic vein were found in 209 cases (49.4%). All donors portal vein were classified according to Kyoto University criteria, 365 (86.2%) had classical bifurcation of the main portal vein (MPV); 52 (12.3%) had a trifurcation of the MPV, 4 (0.9%) had a right anterior segmental branch originating from the left portal vein (LPV), 1 (0.3%) had an LPV originating from the right anterior segmental branch and 1 (0.3%) had a right posterior segmental branch arising from the MPV. Of 424 donors, 313 (73.9%) had middle hepatic arteries arising from left hepatic artery, and 121 (28.5%) arising from right hepatic artery, and 7 (1.6%) arising from common hepatic artery. Variant arteries were found in 149 cases (35.2%), 82 (19.4%) had accessory left hepatic arteries and 17 (4.0%) had accessory right hepatic arteries, 30 had (7.1%) replaced left hepatic arteries and 20 (4.7%) had replaced right hepatic arteries. According to intrahepatic bile duct anatomies, all 424 cases of living donors can be classified to four types: the right posterior sectional bile duct joined with the right anterior sectional bile duct, forming the right hepatic duct (type A, n = 284); the right posterior sectional bile duct entered the confluence of the right anterior sectional bile duct and the left hepatic duct (type B, n = 85); the right posterior sectional bile duct drained into the left hepatic duct (type C, n = 34); other type (type D, n =21). All donors liver function returned to normal level in 2 weeks after surgery. Bile leakage was

found in 14 donors, which had been were conservatively treated; Incomplete intestinal obstruction was found in 10 cases of donors, whose condition were improved after conservative treatment; Incision pain appeared in 78 cases need to deal with. Complications were not found in the remaining 322 donors and all donors retuned to normal daily activities.

CONCLUSION: The precise assessment of donor vascular and biliary anatomy is vital for successful living donor liver transplant.

PP-2003

The management of ABO-incompatible pediatric living donor liver transplantation: The experience of a single center.

Ma Nan, Gao Wei, Sun Chao, Dong Chong, Wang Kai, Li Shanni
Tianjin First Center Hospital, China

INTRODUCTION: To evaluate the safety and clinical effect of ABO-incompatible (ILT) pediatric living donor liver transplantation.

METHODS: We analyzed 169 pediatric living donor liver transplantation recipients of our transplant center from Sept. 20, 2006 to Jan 31, 2015. There are 16 ABO-incompatible liver transplantation cases (table 1). We study the 16 cases. The blood agglutitin titer was monitored (table 2). The titer was controled lower or equal to 1:16 before transplantation. The method to decrease blood agglutitin titer include IVIG and plasma exchange. The patients were treated with Tacrolimus combied with methylprednisolone. Basiliximab for injection (10mg during orpeation, 10mg at 4 days post operation) was used. The survival rate, liver function, acute rejection, vascular and biliary tract complication were monitored.

RESULTS: The 16 patients were observed for one month post operation. All the patient were survived. One acute rejection (case 4) occured, no vascular and biliary tract complication were founded.

CONCLUSION: In our experience, ILT in small infants has short term outcomes comparable to ABO-compatible grafts and excellent results can be achieved with a standard immunosuppressive protocol. To avoid mortality on the waiting list for neonatal recipients, ABO-incompatible liver grafts can be used safely.

The 2nd International Congress of

Living Donor Liver Transplantation Study Group

(ILDLT Study Group 2015)

대한간이식연구회

The Korean Liver Transplantation Society

Joint with the Korean Liver Transplantation Society

COORDINATOR SESSION (KLTS)

SCIENTIFIC PROGRAMS (Day 1 : November 7)

16:40-17:55	**[Coordinator Session]**	Dongdaemun 1
	CHAIRPERSONS: Hea Seon Ha (Korea), Hyung Sook Kim (Korea)	
16:40-17:05	Pitfalls of Current Regulation of Emergency Status 2A in LT	Ji Yeon Park (Korea)
17:05-17:30	The Role of the Transplant Coordinator of the Transition to the MELD System	Kyung Ock Jeon (Korea)
17:30-17:55	The Quality of Life in Living Donors after Liver Transplantation	Seung Heui Hong (Korea)

CHAIRPERSONS

NAME	AFFILIATION	COUNTRY
Hea Seon Ha	Asan Medical Center	Korea
Hyung Sook Kim	St. Mary's Hospital	Korea

INVITED SPEAKERS

Seung Heui Hong

AFFILIATION

Department of Organ Transplant Center, Samsung Medical Center, Korea

BRIEF CV

She graduated from Hanyang University. She has been with Samsung Medical Center, Korea as a organ transplant coordinator since 2000, especially liver transplant.

RESEARCH INTERESTS

간 기증자의 삶의 질

간 수혜자의 삶의 질

간 기증자와 수혜자의 교육 및 상담

Kyoung Ock Jeon

AFFILIATION

Organ Transplantation Center, Yonsei University College of Medicine, Severance Hospital, Korea

BRIEF CV

Master of Health management (March 2002-August 2004)
Graduate School of Public Health Yonsei University, Seoul, Korea
Graduate Yonsei University college of Nursing, Seoul, Korea
(March 1983-February 1987)
Transplant Coordinator (April 1999-present)
Korean Transplant Coordinator Association President(November 2003- 2009)
Korea Organ Donation Agency Board Member (2009-present)

RESEARCH INTERESTS

Living donor quality of life
Cost effectiveness; Study on end-stage renal disease patients for economic evaluation between renal transplantation and hemodialysis

Ji Yeon Park

AFFILIATION

Organ Transplantation Center, Seoul ST. Mary's Hospital, Korea

BRIEF CV

She graduated from the catholic University of Nursing in 2002. She received a master's degree in 2009, Yonsei University graduate school of Nursing. And She has been worked with Seoul ST. Mary's Hospital as a organ transplantation coordinator since 2008

RESEARCH INTERESTS

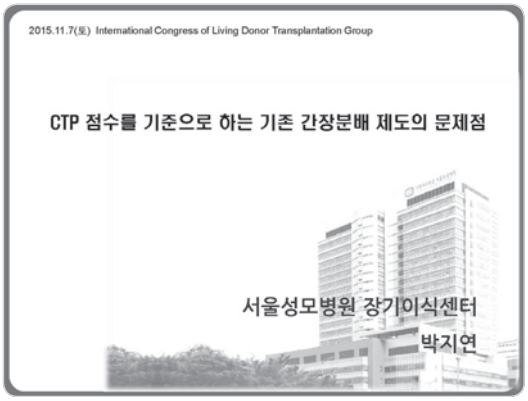
[COORDINATOR SESSION]

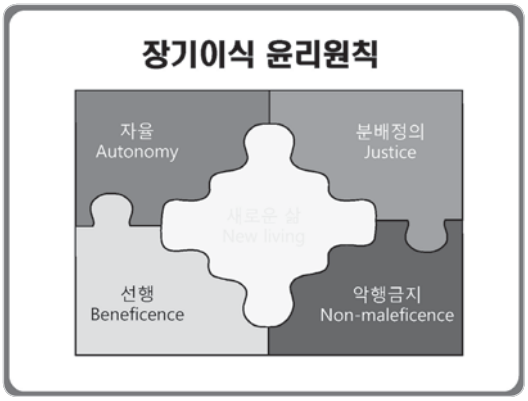
16:40-17:05

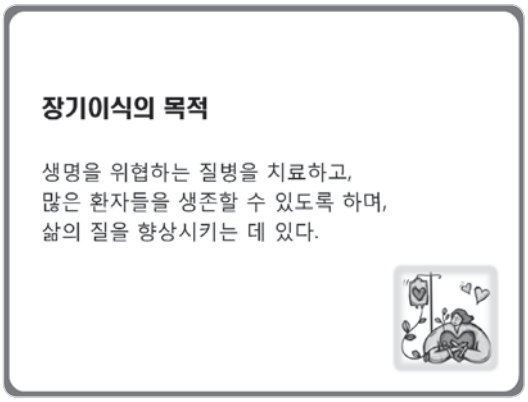
Pitfalls of Current Regulation of Emergency Status 2A in LT

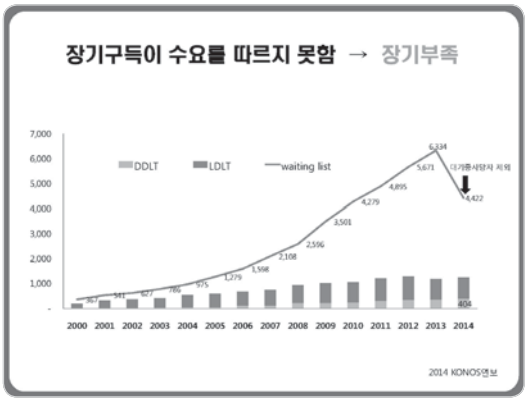
Ji Yeon Park

Organ Transplantation Center
St. Mary's Hospital, Korea









장기등 이식에 관한 법률

"장기등의 적출 및 이식을 적정하게 하고 국민보건을 향상"

제6조 (국가 및 지방자치단체의 의무)
국가와 지방자치단체는 장기등의 이식이 필요한 모든 사람에게 이식받을 기회를 공평하게 보장하여야 하고, 장기등의 적출 · 이식이 적정하게 이루어지도록 하여야 한다.

인간세포, 조직 및 장기이식에 관한 WHO의 지침 (2010.5월)

지침 9
장기나 세포, 조직의 배정은 재정적 또는 다른 고려사항에 의해서가 아니라 임상적 기준과 윤리적 규범에 따라 이루어져야 한다. 배정과 관련된 규정은 적절히 구성된 위원회에 의해 정의되고 공평해야 하며 대외적으로 정당하고 또한 투명해야 한다.

장기매매 및 이식관광에 관한 이스탄불 선언

이식을 위한 장기는 국가 내에서 성별, 민족, 종교, 사회적 또는 재정적 상태에 관계없이 적절한 수혜자에게 공정하게 배분되어야 한다.

장기분배의 윤리

공정성 투명성 형평성 적정성

이식 대상자의 선정기준

1) 체중의 **0.5배-2.0배**에서 우선 선정

2) 1)에 해당하는 사람이 2명 이상이면 응급도 **최고등급에 속하는 사람 중** 응급도가 높은 사람을 선정

3) 2)에 해당하는 사람이 2명 이상이면,
가) 1순위:응급도가 같으면 기증자와 같은 권역에 있는 사람
나) 2순위: 기증자와 다른 권역에 있는 사람

4) 응급도가 최고등급에 속하는 사람이 없으면 기증자와 같은 권역에 있는 응급도 높은 사람을 선정

5) 3)또는4)에 해당하는 사람이 2명 이상이면 다음의 항목별 점수의 합계가 가장 높은 사람을 선정
가) 나이
나) 대기기간
다) 기증전력자등인지 여부
라) 기증자와 혈액형이 같은지 여부
마) 기증자와의 지리적 근접도

** 1권역-서울,경기,인천,강원,제주 / 2권역-대전,충남,충북,광주,전북 / 3권역-부산,울산,대구,경남,경북

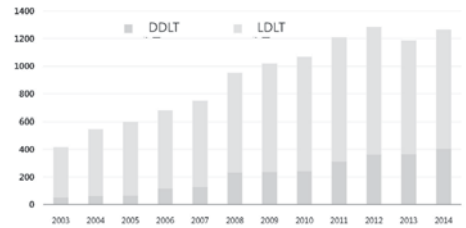
응급도	등록요건
STATUS 1(재이식)	□ 간이 □ 간이
STATUS 1	□ 만성 간질환 없이 간실패로 입원이 다라난 후 8주 이내에 급성 전격성 간부전이 발생 하고 뚜렷한 간성혼수가 동반된 경우 □ flapping tremor □ hyperbilirubinemia □ PT>20초 or INR>2.5 or hypoglycemia □ 윌슨병(Wilson's disease)환자에게 급성 간기능 부전이 동반된 경우
STATUS 2A	- 만성 간부전증(Chronic liver failure) 환자가 집중치료실에 입원해야한 하는 상태로 7일 이 내에 간이식을 받지 않으면 생명연장의 희망이 없는 경우 - CTP가 10점 이상이면서 다음의 한가지 이상에 해당해야 한다. □ 치료에 반응하지 않는 활동성 정맥류 출혈 □ 간신증후군 □ 난치성 복수/간-흉수증 □ 내과적 치료에 반응하지 않는 stage Ⅲ-Ⅳ의 뇌질환
STATUS 2B	-CTP10점이상이거나 7점이상이면서 다음 하나에 해당해야 한다. □ 치료에 반응하지 않는 활동성 정맥류 출혈 □ 특발성 세균성 복막염 □ 난치성 복수/간-흉수증 □ 간세포암의 경우 stage Ⅰ-Ⅱ로 판별된 환자
STATUS 3	□ 지속적인 치료를 요하고 CTP점수가 7점 이상이나 2B에 해당하지 않는 경우 □ 간세포암의 경우 stage Ⅲ 이상인 환자

등록기간 : 2weeks

CTP Score (Child-Turcotte- Pugh Score)

	1점	2점	3점
Bilirubin(Total)	<2mg/dl	2-3mg/dl	>3mg/dl
Serum albumin	>3.5	2.8-3.5	<2.8
INR	<1.7	1.71-2.20	>2.20
Ascites	None	Mild	Severe
Hepatic encephalopathy	None	Grade 1~2	Grade 3~4
**일차성 담즙성 경화증, 일차성 경화성 담도염, 또는 기타 담즙분비 정지성 간질환:			
Bilirubin(Total)	<4mg/dl	4-10mg/dl	10mg/dl

국내 간이식 현황



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
DDLT	50	64	66	118	128	233	236	242	313	363	367	404
LDLT	364	480	532	560	621	717	783	824	897	920	819	861
%DDLT	12.1%	11.8%	11.1%	17.4%	17.0%	21.1%	19.1%	22.5%	25.9%	28.8%	31.7%	31.9%

2014 KONOS연보

뇌사자 간이식 - 응급도

	계	Status1 (제이식)	Status1	Status2A	Status2B	Status3
2010	242	5	12	99	118	8
2011	313	8	23	135	141	6
2012	363	9	20	179	148	7
2013	367	11	22	174	151	9
2014	404	18	17	202	163	4

50% 43%

2014년 KONOS연보

장기분배의 원칙

공정성

공평하고 올바른 성질.

응급도가 높은 사람을 선정

CTP Score (Child-Turcotte- Pugh Score)

	1점	2점	3점
Bilirubin(Total)	<2mg/dl	2-3mg/dl	>3mg/dl
Serum albumin	>3.5	2.8-3.5	<2.8
INR	<1.7	1.71-2.20	>2.20
Ascites	None	Mild	Severe
Hepatic encephalopathy	None	Grade 1~2	Grade 3~4
**일차성 담즙성 경화증, 일차성 경화성 담도염, 또는 기타 담즙분비 정지성 간질환:			
Bilirubin(Total)	<4mg/dl	4-10mg/dl	10mg/dl

MELD and PELD: Application of Survival Models to Liver Allocation

Russell H. Wiesner, Sue V. McDiarmid, Patrick S. Kamath, Eric B. Edwards, Michael Malinchoc, Walter K. Kremers, Ruud A.F. Krom, and W. Ray Kim

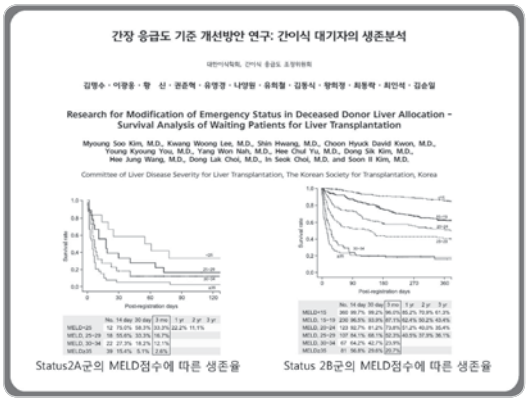
CTP score

질환의 중증도 판별 제약

Waiting time이 주된 변수로 작용

주관적 판단

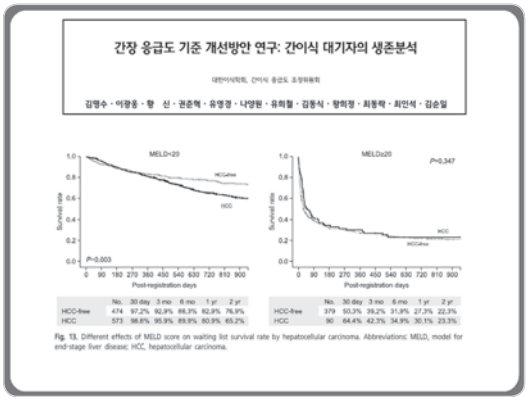
- 복수, 혼수
- 중환자실에 입원해야만 하는...
- 7일 이내 사망의 가능성...



뇌사자 간이식 – 진단명

구분	2010	2011	2012	2013	2014
acute	24	26	27	25	23
Alcohol	20	57	68	72	111
HBV	120	124	165	151	141
HCV	10	21	27	22	21
HCC	29	13	20	15	22
Biliary Atresia	7	10	7	13	18
Biliary cirrhosis	1	4	2	6	4
PBC		2	1	2	
unknown	3	2	5	3	5
Metabolic	2	10	2	4	7
기타	26	44	39	54	52

2014 KONOS연보



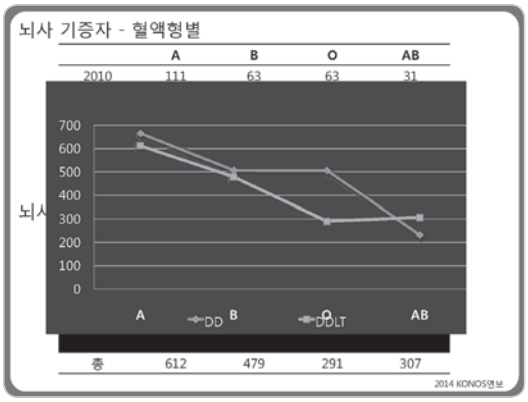
장기분배의 원칙

형평성

'주어진 상황'이라는 개념과는 무관하게
일관성있는 처사

이식 대상자의 선정기준 – 장기별 항목 점수

항목	내용	점수
나이	15세이상	0점
	15세 미만	0점
대기시간	(총대기자수-대기자순위)/총대기자수X10	
기증전력자동인지 여부	과거기증여부, 배우자, 직계존비속	4점
	형제자매	3점
	4촌이내	2점
혈액형	동일	10점
	호환	5점
지리적 근접도	응급도1(status1, 2A)	동일병원 0점
	응급도 2(status2B) 응급도 3(status3)	동일병원 10점



<미국>혈액형에 따른 장기배분

OPTN POLICIES

9.6.C Allocation of Livers by Blood Type

Livers from blood type O deceased donors may be offered to *any* of the following:

- Status 1A and 1B candidates.
- Blood type O candidates.
- Blood type B candidates with a MELD or PELD score ≥ 30.
- Any remaining blood type compatible candidates once the blood type O and B candidates on the match run have been exhausted at the regional and national level.

#미국 백인 혈액형 분포 O:45%, A:42%, B:10%, AB:3%

<미국>혈액형에 따른 장기배분

OPTN POLICIES

9.5.B Points Assigned by Blood Type

For status 1A and 1B transplant candidates, those with the same blood type as the deceased liver donor will receive 10 points. Candidates with compatible but not identical blood types will receive 5 points, and candidates with incompatible types will receive 0 points.

Blood type O candidates who will accept a liver from a blood type A, non-A_1 blood type donor will receive 5 points for blood type incompatible matching. Within each MELD or PELD score, donor livers will be offered to transplant candidates with blood types identical to the deceased donor first, then to candidates who are blood type compatible, followed by candidates who are blood type incompatible with the deceased donor.

#미국 백인 혈액형 분포 O:45%, A:42%, B:10%, AB:3%

장기분배의 원칙

투명성과 적정성

- 응급도 심사
- 간장분과위원회
  - 응급도의 적정성평가
  - 응급도에 대한 세부기준 마련

Thank You

[COORDINATOR SESSION]

17:05-17:30

The Role of the Transplant Coordinator of the Transition to the MELD System

Kyung Ock Jeon

Organ Transplantation Center
Severance Hospital, Korea

2000년 장기등이식에 관한 법이 시행 된 이후 우리나라는 현재 간장 배분은 대기자의 응급도를 CTP(Child-Turcotte-Pugh)점수를 근거로 한 Status 상태에 따라서 배분되고 있다. 그러나 이미 미국의 경우 2002년에 MELD(model for end-stage liver disease) 점수에 따른 간장 분배 제도를 시행해 왔다. 국내에서도 간장을 간이식 대기자에게 공정하고 효과적으로 배분하려는 많은 노력이 있어 왔으며, 2013년도 국립장기이식센터에서 발주한 정책 연구용역사업 결과에서도 기존의 Status 시스템보다 MELD 시스템이 간장 응급도를 정확하고, 세밀하게 예측하는 것으로 보고됨에 따라 이어 MELD시스템 도입을 위한 기초항목 개발 연구가 시행되었고 MELD 시스템에 따른 간장 분배 제도 도입이 시행되기에 이르렀다. MELD시스템은 Cr, INR Total Bilirubin 의 수치와 간암 유무에 따른 환자의 상태를 기준으로 하는 간장 분배 시스템으로 혈액검사 결과를 국립장기이식센터에 보고하는 시점과 재산정 기간이 간 배정의 결정적 요소이므로 이식대기자를 관리하고 의학적 자료를 업데이트하는 업무를 담당하고 있는 장기이식코디네이터의 역할이 중요하다 할 것이다.
전격성 간부전 환자를 위한 응급도1의 기준은 강화되었고 응급도 구간별로 재산정 기간과 검사결과 인정 범위 시간이 아래 표와 같이 상이하므로 좀 더 철저하고 체계적인 환자관리와 국립장기이식센터로의 보고가 엄격하게 관리되어야 할 것이다.

▷ MELD 등록 및 재산정 시기

응급도 등급	재산정 기간	검사결과 인정 범위
응급도 1	7일 이내 재산정	48시간 이내의 결과 인정
응급도 2 (MELD 〉 30)	7일 이내 재산정	48시간 이내의 결과 인정
응급도 3 (MELD 〉 21-30)	3개월 이내 재산정	14일 이내의 결과 인정
응급도 4 (MELD 〉 20)	6개월 이내 재산정	30일 이내의 결과 인정

*응급도 1은 1주 연장만 가능하며 2주 후에는 MELD 점수에 의하여 배정하며 재산정 기간내에서 재산정이 가능, 재산정기간을 초과한 경우 MELD 6점으로 감점한다.

[COORDINATOR SESSION]

17:30-17:55

The Quality of Life In Living Donors After Liver Transplantation

Seung Heui Hong

Organ Transplantation Center
Samsung Medical Center, Korea

장기이식수술은 장기 부전환자들의 생명연장과 삶의 질을 향상시킬 수 있는 유일한 기회로서 의료진의 초점은 기증자보다는 수혜자의 스트레스나 극복능력 그리고 삶의 질에 맞춰져 있고(Hsu, Hwang, Lee & Chen, 2006) 간 기증자를 선정하는 과정에서 간이식 수혜자의 이식성적을 고려하여 좀 더 젊은 기증자를 선택(18) 하게 되는데 KONOS(2014)의 통계에 의하면 19-49세까지의 왕성한 활동을 하게 되는 시기에 기증을 하게 되는 경우가 전체 간 기증자의 87.3%를 차지한다. 또한 대부분이 환자와 밀접한 관계를 맺고 있는 가족이 기증을 하게 되는데, 90.9%가 부부, 부모, 자녀, 형제자매간의 가까운 가족이 기증을 하게 된다. 이들은 기증자인 동시에 수혜자를 직접 돌보는 사람으로서 기증 전과 후에 지속적으로 환자를 간호해야 하는 것에 대한 부담을 가지고 있고, 수술 직후 예상보다 더욱 심한 통증을 느낀다고 하였다(Trotter 등, 2001; Renz & Roberts, 2000). 한편 생체부분간이식에 있어 중요하게 생각하여야 하는 것은 간이식 수혜자와 달리 기증자는 기증 전에 건강했었고 아프지 않았던 상태였기 때문에 가능한 짧은 시간 내에 기증 전의 건강상태로 돌아가야 한다는 것이고(12), 뿐만 아니라 기증자들에게는 기증 전의 직업이나 학업으로의 복귀나 활동 정도가 매우 중요하다. 기증 후 회복기간은 기증자의 상태에 따라 다양하게 보고 되고 있으나 실제로 임상에서는 수술 후 4주가 경과하면 간 기증자는 기증 전의 상태로 회복되어 정상생활로 복귀가 가능하다(19)고 보고 기증자에게 정상 생활로의 복귀를 격려하고 있는 상태이다. 그러나 퇴원 후에도 소화기 장애, 복통, 피로, 두통, 식욕감퇴 등으로 병원이나 약국을 방문한 경험이 있고, 이런 경험은 일상생활로의 복귀에 영향을 미치는 것으로 나타났다(2). 특히 건강한 기증자들의 우엽간 절제 후 합병증 발생률이 증가하고 심지어 사망한 사례까지 보고되므로(22) 수술 전 정밀 검사를 통한 적절한 기증자의 선정과 수술 후 관리가 필요하며 장기적으로는 기증자의 삶의 질 관리도 필요하다(16).

삶의 질이란 신체적, 정서적, 사회적, 기능적 영역의 건강에 대한 개인의 지각(6)이라고 요약할 수 있다. 의료분야에서는 종래의 생명보존과 수명연장만을 중시하던 가치관에서 벗어나 생의 의미와 삶의 질을 강조하게 되었다(8). 즉 단순히 질병의 호전 여부보다는 환자가 느끼는 전반적인 상태, 즉 삶의 질의 변화가 중요하다는 관점에서 삶의 질은 보다 적극적이고 포괄적인 의미로 사용되고 있다(3). 삶의 질은 환자 스스로의 경험에 관심을 둔다는 점에서 주관적 요소가 강하며 김수영(1998)은 삶의 질을 각 개인이 주관적으로 평가한 건강상태라고 하였다. 그러한 이유로 각 문화권이나 국가에 따라서 상당히 다른 양상을 보일 수 있다.

간 기증자에 있어서의 삶의 질을 살펴보면, 생체부분간이식의 대상이 소아에서 성인으로 확대되면서 기증하게 되는 부분이 간좌측엽에서 간우엽으로 커지게 되었고, 이와 더불어 기증자의 삶의 질에 더욱 많은 관심을 가지게 되었는데, 많은 연구에서 정상 모집단에 비해 기증자의 삶의 질 점수가 높았고(16,21-23), 신장 기증자를 대상으로 한 연구에서도 유사한 결과를 보였는데(10,15), 이는 기증자를 선택하는 과정에서 기본적으로 신체적, 정신적인 문제가 있는 경우는 완전 제외되었기 때문이라고 하였다(21). 이와는 대조적으로, 유진영 등(2004)의 연구에서는 신체적 역할 제

한과 정서적 역할 제한 항목에서 기증자의 삶의 질이 대조군보다 유의하게 낮은 점수를 보여, 기증 후 의학적으로 회복되었음에도 불구하고 자가 평가 건강 수준에 있어서 신체-정신적인 역할에 제한을 느끼고 있는 것으로 나타나 신체-정신적 역할에 대한 고려가 삶의 질에 영향을 미침을 알 수 있다.

Pascher 등(2002)과 Walter 등(2003), 홍승희(2005) 그리고 Chan, Liu, Lo, Lam, Lee, 와 Fan(2006)은 간 기증자의 기증 전과 후의 삶의 질을 비교한 연구를 보고하였다. Pascher 등(2002)의 기증 전과 기증 후 6개월 그리고 기증 후 12개월의 삶의 질 연구에서 대상자의 삶의 질 수준은 기증 전에 비하여 기증 후에 점점 증가하고, 독일 내 건강한 모집단보다 더욱 높은 수준을 보였다. 이 결과와는 대조적으로 Walter 등(2003)은 기증 전과 기증 후 6개월의 삶의 질을 비교한 결과, 기증 후에는 신체적 건강과 생활 상태의 두 영역에서 기증 전에 비해 삶의 질 수준이 낮게 나타났다고 하였고, 홍승희(2005)는 기증 후 3개월에 정신건강 요약치는 기증 전 수준으로 회복된 반면 신체건강 요약치가 기증 전 수준으로 회복되지 않는다고 하였다. Chan 등(2006)도 기증 전과 기증 후1, 2, 3, 6, 12개월의 삶의 질에 관한 연구에서 기증 후에 정신영역은 빠르게 회복되었으나 신체영역은 완전히 회복되는데 6개월 내지 12개월이 걸린다고 하였다.

간기증자 10명의 경험을 분석한 정선주(2011)의 연구에서는 간기증 결정동기, 정보부족, 의사의 관리부족, 신체적인 어려움, 심리·정신적인 양가감정, 사회·경제적인 어려움, 복귀 및 회복시기의 지연, 바램 그리고 어려움 극복의 9개 영역이 도출되었는데 이 결과를 바탕으로 생체 간 기증자를 위한 효율적인 교육프로그램을 개발하여 간기증 전·후 적절한 준비와 대처 및 수술 후 적응을 긍정적으로 해나갈 수 있도록 전문적인 간호중재가 필요하다고 하였다.

따라서 기증자의 기증 후의 삶의 질을 기증 전의 수준으로 가능한 빨리 회복시키기 위해서는 기증 전 단계에서 기증자가 의료인으로부터 들을 수 있는 의학적 정보 뿐만 아니라 장기 기증을 한 기증자로부터 기증에 대하여 함께 정보를 공유할 수 있는 멘토 프로그램의 활용이 필요하겠고 기증 후에는 영양교육, 운동프로그램 등을 이용하여 다른 수술 환자와 비교하여 좀 더 체계적인 간호가 제공될 필요가 있고 기증자에 대하여 의료인의 차별화된 관심이 필요한 것으로 사료되는 바이다.

참고문헌

1. 국립장기이식관리센터(2014). KONOS 연보
2. 김수영(1998). 삶의 질 측정도구의 변역. 가정의학회지,19(11), 1034-1042.
3. 유진영, 이남준, 서경석, 권준혁, 최석호, 이건욱(2004). 생체 부분 간이식 공여자의 삶의 질에 관한 연구. 대한이식학회지, 18(1), 73-80.
4. 윤종율(1998). 삶의 질 측정의 몇가지 문제 1.-새로운 측정도구의 개발. 가정의학회지, 19(11), 1016-1024.
5. 정선주(2011). 생체부분간이식 기증자의 경험. 한양대학교 대학원 석사학위논문.
6. 홍승희(2005). 간 공여자의 공여 후 삶의 질 변화. 성균관대학교 임상간호대학원 석사학위 논문.
7. Bullinger, M., Schmidt, S., & Petersen, C. (2002). Assessing quality of life of children with chronic health conditions and disabilities. International Journal of Rehabilitation Research, 25(3), 197-206.
8. Chan, S.C., Liu,C.L., Lo, C.M., Lam,B.K., Lee, E.W., & Fan, S.T.(2006). Donor quallity of life before and after adult-to adult right liver live donor liver transplantation. Liver transplantaion, 12, 1529-1536.
9. Freed, M.M.(1984). Quality of life : The physician's dilemma. Archies of Physical Medicine and Rehabilitation, 63, 56-59.
10. Giessing, M., Reuter, S., Scho B., Deger, S., Teurk, I., Hirte, I., Budde, D., Fritsche, L., Morgera, S., Neumayer, H.H., &Loening, S.A. (2004). Quality of life of living kidney donors in Germany: A survey with the validated short form-36 and giessen subjective complaints list-24 questionnaires. Transplantation, 78(6), 864-872.

11. Humphreville, Vanessa R., Radosevich, David M., Humar, Abhinav, Payne, William D., Kandaswamy, Raja, Lake, John R., Matas, Arthur J., Pruett, Timothy L., Chinnakotla, Srinath.(2015) Long-term health-related quality of life after lilving liver donation.
12. Hsu, H.T., Hwang, S.L., Lee, P.H., & Chen, S.C.(2006). Impact of liver donation on quality of life and physical and psychological distress. Transplantation Proceedings, 38, 2102-2105.
13. Humar, A., Carolan, E., Ibrahim, H., Horn, K., Larson, E., Glessing, B., Kandaswamy, R., Gruessner, R.W., Lake, J. & Payne, W.D.(2005) A camparison of surgical outcomes and quality of life surveys in right lobe vs. lt. lateral segment liver donors. American Journal of Transplantation, 5, 805-809.
14. Kim-Schluger, L., Florman, S.S., Schiano, T., O'Rourke, M., Gagliardi, R., Drooker, M., Emre, S., Fishbein, T.M., Sheiner, P.A., Schwarts, M.E., & Miller, C.M. (2002). Quality of life after lobectomy for adult liver transplantation. Transplantation, 73(10), 1593-1597.
15. Lumsdaine, J.A., Wray, A., Power, M.J., Jamieson, N.V., Akyol, M., Bradley, J.A., Forsythe, J.L.R., & Wigmore, S.J. (2005). Higher quality of life in living donor kidney transplantation: prospective cohort study. Transplant International, 18, 975-980.
16. Miyagi, S., Kawagishi, N., Fujimori, K., Sekiguchi, S., Fukumori, T., Akamatsu, Y., & Satomi, S. (2005). Risks of donation and quality of donors' life after living donor liver transplantation. Transplant International, 18(1), 47-51.
17. Pascher,A., Sauer, I.M., &Walter, M., et al. (2002). Donor evaluation, donor risks, donor outcome, and donor quality of life in adult-to-adult living donor liver transplantation. Liver Transplantation, 8(9), 829-837.
18. Renz, J.F., &Roberts, J.P. (2000). Long-term complications of living donor liver transplantation. Liver Transplantation, 6(6B), S73-S76.
19. Rustgi,S.D., Marino, G., Halpern,M.T., Umana,W.O.,Tolleris, C., & Rustgi, V.K.(2002). Impact of donor age on graft survival among liver transplant recipients: Analysis of the United Network for Organ Sharing database. Transplantation Proceedings,34,3295-3297.
20. Tanaka,K.,&Inomata,.Y.(1997). Present status and prospects of living-related liver transplantation. Journal of Hepato-biliary-pancreatic Surgery,4,51-70.
21. Trotter, J.F., Talamantes, M., McClure, M., Wachs, M., Bak, T., Trouillot, T., Kugelmas, M., Everson, G.T., & Kam, I. (2001). Right hepatic lobe donation for living donor liver transplantation: Impact on donor quality of life. Liver Transplantation, 7(6), 485-493.
22. Verbesey, J.E., Simpson, M.A., Pomposelli, J.J., Richman, E., Bracken, A.M., Garrigan, K., Chang, H., Jenkins, R.L., & Pomfret, E.A. (2005). Living donor adult liver transplantation: a longitudinal study of the donor's quality of life. American Journal of Transplantation, 5, 2770-2777.
23. Walter, M., Dammann, G., Papachristou, A., Neuhaus, P., Danzer,G., & Klapp, B.F. (2003). Quality of life of living donors before and after living donor liver transplantation. Transplantation Proceedings, 35, 2961-2963.

NOTE

Plus sutures

Thank you for 10 years of trust.
Together we will continue with our effort in contributing to a better patient outcome.

ETHICON
PART OF THE Johnson & Johnson FAMILY OF COMPANIES

Shaping the future of surgery

MOMENTS LIKE THIS...

SOVALDI® transforms HCV therapy

- SOVALDI is the first approved HCV NS5B nucleotide polymerase inhibitor with Pan-genotypic antiviral activity[a]
- 97% Cure of HCV patients with Genotype 2 in 12 weeks, with SOVALDI and RBV combination regimen.[1, b, c]
- No adverse drug reactions specific to Sovaldi has been identified in clinical trials[5, d]
- SOVALDI-based regimens are recommended in major guidelines[2-4]
- >100,000 patients have been prescribed SOVALDI-based regimens[6]

SOVALDI is indicated in combination with other medicinal products for the treatment of chronic hepatitis C (CHC) in adults.

a.Sovaldi is indicated for treatment with genotype 1,2,3 and 4 HCV infected patients according to local label **b.**based on SVR12 in clinical study for Korean population **c.**Sustained virologic response (SVR) was the primary endpoint and was defined as HCV RNA <25 IU/mL at 12 weeks after the cessation of treatment. Achieving SVR is considered a virologic Cure **d.**when studied in combination with RBV ± Peg-IFN

References 1. Ahn SH et al. Asia Pacific Association for the Study of the Liver. Istanbu,l Turkey; 2015. [Abstract no. 1977] **2.**WHO.Guidelines for the screening, care and treatment of persons with hepatitis infection. April 2014. Available at: http://www.who.int/hiv/pub/hepatitis/hepatitis-c-guidelines/en/. **3.**EASL guidelines.J Hepatol. 2014;61:373?395. **4.**AASLD and IDSA Recommendations for Testing, Managing, and Treating Hepatitis C. Revised Date: December 19, 2014. Available at:http://www.hcvguidelines.org **5.**Sovaldi Product Information_ http://drug.mfds.go.kr **6.**This information is derived from IMS NPA Market Dynamics, IMS NPA Monthly data, IntergiChain DNA National, and 867 data; data reflect estimated patient starts from December 2013-June 2015

SOVALDI®
SOFOSBUVIR
400 mg TABLETS
HCV treatment transformed

SOVALDI tab.

▼Dosage Forms and strength
Each tablet contains: Sofosbuvir 400 mg

▼Form
A yellow, capsule-shaped, film-coated tablet, debossed with "GSI" on one side and "7977" on the other side.

▼Indication: For the treatment of genotype 1, 2, 3 and 4 chronic hepatitis C (CHC) in adults in combination with other medicinal products.

▼Dosage and Administration
Treatment of this drug should be initiated and monitored by a physician experienced in the management of patients with CHC. •Posology: The recommended dose is one 400 mg tablet, taken orally, once daily with or without food. This drug should be used in combination with other medicinal products. Monotherapy of this drug is not recommended. Refer also to the Prescribing information of the medicinal products that are used in combination with this drug. The recommended co administered medicinal product(s) and treatment duration for this drug combination therapy are provided in Table 1. Table 1: Recommended co administered medicinal product(s) and treatment duration for This drug combination therapy [a b c d e]

Patient population[a]	Treatment		Duration
Patients with genotype 1 and 4 CHC	HCV mono-infection	This drug + ribavirin[†] + peginterferon alfa	12 weeks[a, b]
	HCV mono-infection	This drug + ribavirin[†] Only for use in patients ineligible or intolerant to peginterferon alfa (Please refer to "Precautions 3. Carefully administer to the following patients".)	24 weeks[a]
	HIV coinfection	This drug + ribavirin[†]	24 weeks
Patients with genotype 2 CHC	This drug + ribavirin[†]		12 weeks[a, c]
Patients with genotype 3 CHC	This drug + ribavirin[†]		24 weeks[c]
Patients with CHC awaiting liver transplantation	This drug + ribavirin[†]		Up to 48 weeks or until liver transplantation, whichever occurs first[a]

※Plasma HCV RNA values were measured during the clinical studies using the Roche COBAS® TaqMan® and the value for limit of detection (LOD) was10 IU/mL and lower limit of quantification (LLOQ) was 25 IU/mL.

† Includes patients co infected with human immunodeficiency virus (HIV) and patients with cirrhosis.
a. For previously failed patients with HCV genotype 1 and 4 infections, the safety and efficacy of the combination regimen with this drug have not been investigated. **b.** Care consideration should be given to potentially extending the duration of therapy beyond 12 weeks and up to 24 weeks, especially for those subgroups who have one or more risk factors historically associated with lower response rates to interferon based therapies (e.g. advanced fibrosis/cirrhosis, high baseline viral concentrations, 1,2,4b non-CC genotype, and prior nul response to peginterferon alfa and ribavirin therapy). **c.** Treatment-naïve patients and patients who do not have experience with other HCV protease inhibitor and previously failed in peginterferon alpha treatment. **d.** See Special patient populations - Patients awaiting liver transplantation. **e.** When used in combination with ribavirin, ribavirin is administered twice a day with weight-based dose. The daily dose is 1,000 mg for subjects weighing < 75 kg or 1,200 mg for subjects weighing ≥ 75kg with food.

Dose modification: Dose reduction of this drug is not recommended. If this drug is used in combination with peginterferon alfa, and a patient has a serious adverse reaction potentially related to this drug, the peginterferon alfa dose should be reduced or discontinued. Refer to the peginterferon alfa Prescribing information for additional information about how to reduce and/or discontinue the peginterferon alfa dose. If a patient has a serious adverse reaction potentially related to ribavirin, the ribavirin dose should be modified or discontinued, if appropriate, until the adverse reaction abates or decreases in severity. Refer to the ribavirin Prescribing information for guidelines on dose modification and discontinuation based on the patient's haemoglobin concentration and cardiac status.
Discontinuation of dosing: If the other medicinal products used in combination with this drug are permanently discontinued, this drug should also be discontinued. *Special patient populations* •Elderly: No dose adjustment is warranted for elderly patients. •Renal impairment: No dose adjustment of this drug is required for patients with mild or moderate renal impairment. The safety and efficacy of this drug have not been established in patients with severe renal impairment (estimated glomerular filtration rate [eGFR] <30 mL/min/1.73 m2) or end stage renal disease (ESRD) requiring haemodialysis. When this drug is used in combination with peginterferon alfa or ribavirin, refer also to Prescribing information for peginterferon alfa or ribavirin for patients with creatinine clearance (CrCl) <50 mL/min. •Hepatic impairment: No dose adjustment of this drug is required for patients with mild, moderate or severe hepatic impairment (Child Pugh Turcotte [CPT] class A, B or C). The safety and efficacy of this drug have not been established in patients with decompensated cirrhosis. •Patients awaiting liver transplantation: The duration of administration of this drug in patients awaiting liver transplantation should be guided by an assessment of the potential benefits and risks for the individual patient. •Paediatric population: The safety and efficacy of this drug in children and adolescents aged <18 years have not yet been established.
Method of administration: The film-coated tablet is for oral use. Patients should be instructed to swallow the tablet whole. The film coated tablet should not be chewed or crushed, due to the bitter taste of the active substance. Patients should be instructed that if vomiting occurs within 2 hours of dosing an additional tablet should be taken. If vomiting occurs more than 2 hours after dosing, no further dose is needed. If a dose is missed and it is within 18 hours of the normal time, patients should be instructed to take the tablet as soon as possible and then patients should take the next dose at the usual time. If it is after 18 hours then patients should be instructed to wait and take the next dose at the usual time. Patients should be instructed not to take a double dose.

▼Precautions in Use
1. WARNINGS: 1) Symptomatic bradycardia when coadministered with amiodarone and another HCV direct acting antiviral. Postmarketing cases of symptomatic bradycardia and cases requiring pacemaker intervention have been reported when amiodarone is coadministered with this drug in combination with daclatasvir or simeprevir. A fatal cardiac arrest was reported in a patient taking amiodarone who was coadministered a sofosbuvir-containing regimen (Harvoni(ledipasvir/ sofosbuvir)). Bradycardia has generally occurred within hours to days, but cases have been observed up to 2 weeks after initiating HCV treatment. Patients also taking beta blockers, or those with underlying cardiac comorbidities and/or advanced liver disease may be at increased risk for symptomatic bradycardia with coadministration of amiodarone. Bradycardia generally resolved after discontinuation of HCV treatment. The mechanism for this effect is unknown. Coadministration of amiodarone with this drug in combination with another direct acting antiviral (DAA) is not recommended. For patients taking amiodarone who have no other alternative, viable treatment options and who will be coadministered this drug and another DAA: -Consult patients about the risk of symptomatic bradycardia. -Cardiac monitoring in an in-patient setting for the first 48 hours of coadministration is recommended, after which outpatient or self-monitoring of the heart rate should occur on a daily basis through at least the first 2 weeks of treatment. Patients who are taking this drug in combination with another DAA who need to start amiodarone therapy due to no other alternative, viable treatment options should undergo similar cardiac monitoring as outlined above. Due to amiodarone's long half-life, patients discontinuing amiodarone just prior to starting this drug in combination with a DAA should also undergo similar cardiac monitoring as outlined above. Patients who develop signs or symptoms of bradycardia should seek medical evaluation immediately. Symptoms may include near-fainting or fainting, dizziness or lightheadedness, malaise, weakness, excessive tiredness, shortness of breath, chest pains, confusion or memory problems. 2) Pregnancy and concomitant use with ribavirin. When this drug is used in combination with ribavirin or peginterferon alfa/ ribavirin, women of childbearing potential or their male partners must use an effective form of contraception during the treatment and for a period of time after the treatment as recommended in the Prescribing information for ribavirin. Refer to the Prescribing information for ribavirin for additional information. 3) Use with potent P-gp inducers. Medicinal products that are potent P-glycoprotein (P-gp) inducers in the intestine (e.g. rifampicin, St. John's wort [Hypericum perforatum], carbamazepine and phenytoin) may significantly decrease sofosbuvir plasma concentration leading to reduced therapeutic effect of this drug. Such medicinal products should not be used with this drug.
2. Do not administer to the following patients 1) Hypersensitivity to the active substance or any of the excipients of this drug. 2) As this drug is used in combination with other drugs, all contraindications to the combined drugs also apply to this drug combination therapy. Refer to the contraindications for the relevant product (Prescribing information of peginterferon alfa and/or ribavirin). 3) When used in combination with ribavirin or peginterferon alfa/ribavirin, pregnant women and their male partners, or women suspected to be pregnant.
3. Carefully administer to the following patients: 1) Interferon free therapy for genotype 1 and 4 HCV infection. Interferon-free regimens for patients with genotype 1 and 4 HCV infection with this drug have not been investigated in Phase 3 studies. The optimal regimen and treatment duration have not been established. Such regimens should only be used for patients that are intolerant to or ineligible for interferon therapy, and are in urgent need of treatment. 24 weeks of treatment with SOF+RBV was studied in 2 open-label clinical trials(Studies PHOTON-1 and PHOTON-2) in subjects with HCV/HIV co-infection. SVR12 rates in genotype 1a and genotype 1b groups were 82% (74/90) vs. 54% (13/24) in PHOTON-1 study and 84% (84/100) vs. 91% (10/11) in PHOTON-2 study, respectively.
4. UNDESIRABLE EFFECTS 1) Summary of the safety profile: During treatment with sofosbuvir in combination with ribavirin or with peginterferon alfa and ribavirin, the most frequently reported adverse drug reactions were consistent with the expected safety profile of ribavirin and peginterferon alfa treatment, without increasing the frequency or severity of the expected adverse drug reactions. Assessment of adverse reactions is based on pooled data from five Phase 3 clinical studies (both controlled and uncontrolled). The proportion of subjects who permanently discontinued treatment due to adverse reactions was 1.4% for subjects receiving placebo, 0.5% for subjects receiving sofosbuvir + ribavirin for 12 weeks, 0% for subjects receiving sofosbuvir + ribavirin for 16 weeks, 11.1% for subjects receiving peginterferon alfa + ribavirin for 24 weeks and 2.4% for subjects receiving sofosbuvir + peginterferon alfa + ribavirin for 12 weeks. 2) Tabulated summary of adverse reactions: This drug has mainly been studied in combination with ribavirin, with or without peginterferon alfa. In this context, no adverse drug reactions specific to sofosbuvir have been identified. The most common adverse drug reactions occurring in subjects receiving sofosbuvir and ribavirin or sofosbuvir, ribavirin and peginterferon alfa were fatigue, headache, nausea and insomnia. The following adverse drug reactions have been identified with sofosbuvir in combination with ribavirin or in combination with peginterferon alfa and ribavirin (Table 2). The adverse reactions are listed below by body system organ class and frequency. Frequencies are defined as follows: very common (≥1/10), common (≥1/100 to <1/10), uncommon (≥1/1,000 to <1/100), rare (≥1/10,000 to <1/1,000) or very rare (<1/10,000).
Table 2: Adverse drug reactions identified with sofosbuvir in combination with ribavirin or peginterferon alfa and ribavirin.

Frequency	SOF[a] + RBV[a]	SOF + PEG[a] + RBV
Infections and infestations:		
Common	nasopharyngitis	
Blood and lymphatic system disorders:		
Very common	haemoglobin decreased	anaemia, neutropenia, lymphocyte count decreased, platelet count decreased
Common	anaemia	
Metabolism and nutrition disorders:		
Very common		decreased appetite
Common		weight decreased
Psychiatric disorders:		
Very common	insomnia	insomnia
Common	depression	depression, anxiety, agitation
Nervous system disorders:		
Very common	headache	dizziness, headache
Common	disturbance in attention	migraine, memory impairment, disturbance in attention
Eye disorders:		
Common		vision blurred
Respiratory, thoracic and mediastinal disorders:		
Very common		dyspnoea, cough
Common	dyspnoea, dyspnoea exertional, cough	dyspnoea exertional
Gastrointestinal disorders:		
Very common	nausea	diarrhoea, nausea, vomiting
Common	abdominal discomfort, constipation, dyspepsia	constipation, dry mouth, gastroesophageal reflux
Hepatobiliary disorders:		
Very common	blood bilirubin increased	blood bilirubin increased
Skin and subcutaneous tissue disorders:		
Very common		rash, pruritus
Common	alopecia, dry skin, pruritus	alopecia, dry skin
Musculoskeletal and connective tissue disorders:		
Very common		arthralgia, myalgia
Common	arthralgia, back pain, muscle spasms, myalgia	back pain, muscle spasms
General disorders and administration site conditions:		
Very common	fatigue, irritability	chills, fatigue, influenza like illness, irritability, pain, pyrexia
Common	pyrexia, asthenia	chest pain, asthenia

a. SOF = sofosbuvir; b. RBV = ribavirin; c. PEG = peginterferon alfa.

3) Other special population(s) •HIV/HCV co infection: The safety profile of sofosbuvir and ribavirin in HCV/HIV co infected subjects was similar to that observed in mono-infected HCV subjects treated with sofosbuvir and ribavirin in Phase 3 clinical studies. •Patients awaiting liver transplantation: The safety profile of sofosbuvir and ribavirin in HCV infected subjects prior to liver transplantation was similar to that observed in subjects treated with sofosbuvir and ribavirin in Phase 3 clinical studies. 4) Postmarketing experiences: In addition to adverse reactions from clinical studies, the following possible adverse reactions were also identified during postapproval use of this drug. Because these reactions were reported voluntarily from a population of unknown size, estimates of frequency cannot be made. •Cardiac disorders: Symptomatic bradycardia (when amiodarone is coadministered with this drug in combination with another HCV direct acting antiviral) [see section 1. Warnings in precautions for use: symptomatic bradycardia when coadministered with amiodarone and another HCV direct acting antiviral]
5. GENERAL PRECAUTIONS 1)This drug is not recommended for administration as monotherapy and should be prescribed in combination with other medicinal products for the treatment of hepatitis C infection. If the other medicinal products used in combination with this drug are permanently discontinued, this drug should also be discontinued (see Posology Section). Consult the Prescribing information for co prescribed medicinal products before starting therapy with this drug. 2) Co-administration with other direct acting antivirals against HCV There are no data to support the co-administration of this drug and telaprevir or boceprevir. Such co-administration is not recommended (see also section 6. Drug Interactions) 3) HCV/HBV (hepatitis B virus) co-infection The safety and efficacy of this drug in patients with HCV/HBV co-infection have not been evaluated. 4) Resistance •In cell culture: HCV replicons with reduced susceptibility to sofosbuvir have been selected in cell culture for multiple genotypes including 1b, 2a, 2b, 3a, 4a, 5a and 6a. Reduced susceptibility to sofosbuvir was associated with the primary NS5B substitution S282T in all replicon genotypes examined. Site directed mutagenesis of the S282T substitution in replicons of 8 genotypes conferred 2 to 18 fold reduced susceptibility to sofosbuvir and reduced the replication viral capacity by 89% to 99% compared to the corresponding wild type. In biochemical assays, recombinant NS5B polymerase from genotypes 1b, 2a, 3a and 4a expressing the S282T substitution showed reduced susceptibility to GS-461203 compared to respective wild types. •In clinical studies: In a pooled analysis of 991 subjects who received sofosbuvir in Phase 3 studies, 226 subjects qualified for resistance analysis due to virologic failure or early study drug discontinuation and having HCV RNA >1,000 IU/mL. Post-baseline NS5B sequences were available for 225 of the 226 subjects, with deep sequencing data (assay cutoff of 1%) from 221 of these subjects. The sofosbuvir associated resistance substitution S282T was not detected in any of these subjects by deep sequencing or population sequencing. The S282T substitution in NS5B was detected in a single subject receiving this drug monotherapy in a Phase 2 study, this subject harboured <1% HCV S282T at baseline and developed S282T (>99%) at 4 weeks post treatment which resulted in a 13.5 fold change in sofosbuvir EC50 and reduced viral replication capacity. The S282T substitution reverted to wild type over the next 8 weeks and was no longer detectable by deep sequencing at 12 weeks post treatment. Two NS5B substitutions, L159F and V321A, were detected in post treatment relapse samples from multiple genotype 3 HCV infected subjects in the Phase 3 clinical studies. No shift in the phenotypic susceptibility to sofosbuvir or ribavirin of subject isolates with these substitutions was detected. In addition, S282R and L320F substitutions were detected on treatment by deep sequencing in a pre-transplant subject with a partial treatment response. The clinical significance of these findings is unknown. In subjects awaiting liver transplantation where subjects received up to 48 weeks of this drug in combination with ribavirin, the L159F substitution emerged in multiple subjects with GT1 HCV who experienced virologic failure (breakthrough and relapse). Furthermore, the presence of substitutions L159F and/or C316N at baseline was associated with sofosbuvir breakthrough and relapse post-transplant. L159F, V321A, L320F, or S282R/S282G were detected in subjects who experienced on-treatment virologic failure. •Effect of baseline HCV polymorphisms on treatment outcome: Baseline NS5B sequences were obtained for 1,292 subjects from Phase 3 studies by population sequencing and the S282T substitution was not detected in any subject with available baseline sequence. In an analysis evaluating the effect of baseline polymorphisms on treatment outcome, no statistically significant association was observed between the presence of any HCV NS5B variant at baseline and treatment outcome. •Cross resistance: HCV replicons expressing the sofosbuvir associated resistance substitution S282T were fully susceptible to other classes of anti HCV agents. Sofosbuvir retained activity against the NS5B substitutions L159F and L320F associated with resistance to other nucleoside inhibitors. Sofosbuvir was fully active against substitutions associated with resistance to other direct acting antivirals with different mechanisms of actions, such as NS5B non-nucleoside inhibitors, NS3 protease inhibitors and NS5A inhibitors.
6. DRUG INTERACTIONS: Sofosbuvir is a nucleotide prodrug. After oral administration of this drug, sofosbuvir is rapidly absorbed and subject to extensive first-pass hepatic and intestinal metabolism. Intracellular hydrolytic prodrug cleavage catalysed by enzymes including carboxylesterase 1 and sequential phosphorylation steps catalysed by nucleotide kinases result in formation of the pharmacologically active uridine nucleoside analogue triphosphate. The predominant inactive circulating metabolite GS-331007 that accounts for greater than 90% of drug related material systemic exposure is formed through pathways sequential and parallel to formation of active metabolite. The parent sofosbuvir accounts for approximately 4% of drug-related material systemic exposure. In clinical pharmacology studies, both sofosbuvir and GS-331007 were measured for purposes of pharmacokinetic analyses. Sofosbuvir is a substrate of drug transporter P-gp and breast cancer resistance protein (BCRP) while GS-331007 is not. Medicinal products that are potent P-gp inducers in the intestine (e.g. rifampicin, St. John's wort, carbamazepine and phenytoin) may decrease sofosbuvir plasma concentration leading to reduced therapeutic effect of this drug and thus should not be used with this drug. Co-administration of this drug with medicinal products that inhibit P-gp and/or BCRP may increase sofosbuvir plasma concentration without increasing GS-331007 plasma concentration, thus this drug may be co administered with P-gp and/or BCRP inhibitors. Sofosbuvir and GS-331007 are not inhibitors of P-gp and BCRP and thus are not expected to increase exposures of medicinal products that are substrates of these transporters. The intracellular metabolic activation pathway of sofosbuvir is mediated by generally low affinity and high capacity hydrolase and nucleotide phosphorylation pathways that are unlikely to be affected by concomitant medicinal products.
Other interactions: Drug interaction information for this drug with potential concomitant medicinal products is summarised in Table 3 below (where the confidence interval (CI) of the geometric least squares mean (GLSM) ratio were within "→", extended above " ↑ ", or extended below " ↓ " the predetermined equivalence boundaries). The table is not all inclusive. [c e d]
Table 3: Interactions between this drug and other medicinal products

Medicinal product by therapeutic areas	Effects on drug levels. Mean ratio (90% confidence interval) for AUC, C_{max}, C_{min} [a, b]	Recommendation concerning co-administration with this drug
ANALEPTICS		
Modafinil	Interaction not studied.	Co-administration of this drug with modafinil is expected to decrease the concentration of sofosbuvir, leading to reduced therapeutic effect of this drug. Such co-administration is not recommended.
ANTICONVULSANTS		
Carbamazepine Phenytoin Phenobarbital Oxcarbazepine	Interaction not studied.	Co-administration of this drug with carbamazepine, phenytoin, phenobarbital or oxcarbazepine is expected to decrease the concentration of sofosbuvir, leading to reduced therapeutic effect of this drug. Such co-administration is not recommended. This drug should not be used with carbamazepine, phenytoin, phenobarbital or oxcarbazepine, potent intestinal P-gp inducers.
ANTIARRHYTHMICS		
Amiodarone	Effect on amiodarone and sofosbuvir concentrations unknown	Coadministration of amiodarone with this drug in combination with another DAA may result in symptomatic bradycardia. The mechanism of this effect is unknown. Coadministration of amiodarone with this drug in combination with another DAA is not recommended; if coadministration is required, cardiac monitoring is recommended (see section 1. Warnings in precautions for use: symptomatic bradycardia when coadministered with amiodarone and another HCV direct acting antiviral).
ANTIMYCOBACTERIALS		
Rifabutin Rifapentine	Interaction not studied.	Co-administration of this drug with rifabutin or rifapentine is expected to decrease the concentration of sofosbuvir, leading to reduced therapeutic effect of this drug. Such co-administration is not recommended.
Rifampicin[†] (600 mg single dose)	Sofosbuvir ↓ C_{max} 0.23 (0.19, 0.29) ↓ AUC 0.28 (0.24, 0.32) GS-331007 →C_{max} 1.23 (1.14, 1.34) →AUC 0.95 (0.88, 1.03)	This drug should not be used with rifampicin, a potent intestinal P-gp inducer.
HERBAL SUPPLEMENTS		
St. John's wort (Hypericum perforatum)	Interaction not studied.	This drug should not be used with St. John's wort, a potent intestinal P-gp inducer.
HCV ANITIVIRAL AGENTS: HCV PROTEASE INHIBITORS		
Boceprevir(BOC) Telaprevir(TPV)	Interaction not studied.	No drug interactio data exists regarding the co-administration of this drug with boceprevir or telaprevir.
NARCOTIC ANALGESICS		
Methadone[†] (Methadone maintenance therapy (30 to 130 mg/daily))	R-methadone →C_{max} 0.99 (0.85, 1.16) →AUC 1.01 (0.85, 1.21) →C_{min} 0.94 (0.77, 1.14) S-methadone →C_{max} 0.95 (0.79, 1.13) →AUC 0.95 (0.77, 1.17) →C_{min} 0.95 (0.74, 1.22) Sofosbuvir ↓ C_{max} 0.95c (0.68, 1.33) ↑ AUC 1.30c (1.00, 1.69) C_{min} (NA) GS-331007 ↓ C_{max} 0.73c (0.65, 0.83) ↓AUC 1.04c (0.89, 1.22) C_{min} (NA)	No dose adjustment of sofosbuvir or methadone is required when sofosbuvir and methadone are used concomitantly.
IMMUNOSUPPRESSANTS		
Ciclosporine[*] (600 mg single dose)	Ciclosporin →C_{max} 1.06 (0.94, 1.18) →AUC 0.98 (0.85, 1.14) C_{min} (NA) Sofosbuvir ↑ C_{max} 2.54 (1.87, 3.45) ↑ AUC 4.53 (3.26, 6.30) C_{min} (NA) GS-331007 ↓ C_{max} 0.60 (0.53, 0.69) →AUC 1.04 (0.90, 1.20) C_{min} (NA)	No dose adjustment of sofosbuvir or ciclosporin is required when sofosbuvir and ciclosporin are used concomitantly.
Tacrolimus[*] (5 mg single dose)	Tacrolimus ↓ C_{max} 0.73 (0.59, 0.90) ↓ AUC 1.09 (0.84, 1.40) C_{min} (NA) Sofosbuvir ↓ C_{max} 0.97 (0.65, 1.43) ↓AUC 1.13 (0.81, 1.57) C_{min} (NA) GS-331007 →C_{max} 0.92 (0.83, 1.14) →AUC 1.00 (0.87, 1.13) C_{min} (NA)	No dose adjustment of sofosbuvir or tacrolimus is required when sofosbuvir and tacrolimus are used concomitantly.
HIV ANTIVIRAL AGENTS: REVERSE TRANSCRIPTASE INHIBITORS		
Efavirenz[†] (600 mg once daily)[d]	Efavirenz →C_{max} 0.95 (0.85, 1.06) →AUC 0.96 (0.91, 1.03) →C_{min} 0.96 (0.93, 0.98) Sofosbuvir ↓ C_{max} 0.81 (0.60, 1.10) ↓AUC 0.94 (0.76, 1.16) C_{min} (NA) GS-331007 ↓ C_{max} 0.77 (0.70, 0.84) ↓AUC 0.84 (0.76, 0.92) C_{min} (NA)	No dose adjustment of sofosbuvir or efavirenz is required when sofosbuvir and efavirenz are used concomitantly.
Emtricitabine[†] (200 mg once daily)[d]	Emtricitabine →C_{max} 0.97 (0.88, 1.07) →AUC 0.99 (0.94, 1.05) →C_{min} 1.04 (0.98, 1.11) Sofosbuvir ↓ C_{max} 0.81 (0.60, 1.10) ↓AUC 0.94 (0.76, 1.16) C_{min} (NA) GS-331007 ↓ C_{max} 0.77 (0.70, 0.84) ↓AUC 0.84 (0.76, 0.92) C_{min} (NA)	No dose adjustment of sofosbuvir or emtricitabine is required when sofosbuvir and emtricitabine are used concomitantly.
Tenofovir disoproxil fumarate[†] (300 mg once daily)[d]	Tenofovir ↑ C_{max} 1.25 (1.08, 1.45) →AUC 0.98 (0.91, 1.05) →C_{min} 0.99 (0.91, 1.07) Sofosbuvir ↓ C_{max} 0.81 (0.60, 1.10) ↓AUC 0.94 (0.76, 1.16) C_{min} (NA) GS-331007 ↓ C_{max} 0.77 (0.70, 0.84) ↓AUC 0.84 (0.76, 0.92) C_{min} (NA)	No dose adjustment of sofosbuvir or tenofovir disoproxil fumarate is required when sofosbuvir and tenofovir disoproxil fumarate are used concomitantly.
Rilpivirine[†] (25 mg once daily)	Rilpivirine →C_{max} 1.06 (0.97, 1.15) →AUC 1.06 (1.02, 1.09) →C_{min} 0.99 (0.94, 1.04) Sofosbuvir ↑ C_{max} 1.31 (0.90, 1.62) →AUC 1.09 (0.94, 1.27) C_{min} (NA) GS-331007 →C_{max} 1.06 (0.99, 1.14) →AUC 1.01 (0.97, 1.04) C_{min} (NA)	No dose adjustment of sofosbuvir or rilpivirine is required when sofosbuvir and rilpivirine are used concomitantly.
HIV ANTIVIRAL AGENTS: HIV PROTEASE INHIBITORS		
Darunavir boosted with ritonavir[†] (800/100 mg once daily)	Darunavir →C_{max} 0.97 (0.94, 1.01) →AUC 0.97 (0.94, 1.00) →C_{min} 0.86 (0.78, 0.96) Sofosbuvir ↑ C_{max} 1.45 (1.10, 1.92) ↑ AUC 1.34 (1.12, 1.59) C_{min} (NA) GS-331007 →C_{max} 0.97 (0.90, 1.05) →AUC 1.24 (1.18, 1.30) C_{min} (NA)	No dose adjustment of sofosbuvir or darunavir (ritonavir boosted) is required when sofosbuvir and darunavir are used concomitantly.
HIV ANTIVIRAL AGENTS: INTEGRASE INHIBITORS		
Raltegravir[†] (400 mg twice daily)	Raltegravir ↓ C_{max} 0.57 (0.44, 0.75) ↓ AUC 0.73 (0.59, 0.91) →C_{min} 0.95 (0.81, 1.12) Sofosbuvir →C_{max} 0.87 (0.71, 1.08) →AUC 0.95 (0.82, 1.09) C_{min} (NA) GS-331007 →C_{max} 1.09 (0.99, 1.20) →AUC 1.03 (0.97, 1.08) C_{min} (NA)	No dose adjustment of sofosbuvir or raltegravir is required when sofosbuvir and raltegravir are used concomitantly.
ORAL CONTRACEPTIVES		
Norgestimate/ ethinyl estradiol	Norgestromin →C_{max} 1.06 (0.93, 1.22) →AUC 1.05 (0.92, 1.20) C_{min} (NA) Norgestrel →C_{max} 1.18 (0.99, 1.41) →AUC 1.19 (0.98, 1.44) C_{min} (NA) Ethinyl estradiol →C_{max} 1.14 (0.96, 1.36) →AUC 1.08 (0.93, 1.25) C_{min} (NA)	No dose adjustment of norgestimate/ethinyl estradiol is required when sofosbuvir and norgestimate/ethinyl estradiol are used concomitantly.

NA = not available/not applicable
a. Mean ratio (90% CI) of co administered drug pharmacokinetics with/without sofosbuvir and mean ratio of sofosbuvir and GS-331007 with/without co administered drug. No effect = 1.00 **b.** All interaction studies conducted in healthy volunteers **c.** Comparison between co administered drug and historical control **d.** Administered as Atripla **e.** Bioequivalence boundary 80%-125% **f.** Equivalence boundary 70%-143%

7. USE IN PREGNANT WOMEN AND NURSING MOTHERS 1) Women of childbearing potential / contraception in males and females When this drug is used in combination with ribavirin or peginterferon alfa/ ribavirin, extreme care must be taken to avoid pregnancy in female patients and in female partners of male patients. Significant teratogenic and/or embryocidal effects have been demonstrated in all animal species exposed to ribavirin. Women of childbearing potential or their male partners must use an effective form of contraception during treatment and for a period of time after the treatment has concluded as recommended in the Prescribing information for ribavirin. Refer to the Prescribing information for ribavirin for additional information regarding use in pregnant women. 2) Pregnancy There are no or limited amount of data (less than 300 pregnancy outcomes) from the use of sofosbuvir in pregnant women. Animal studies do not indicate direct or indirect harmful effects with respect to reproductive toxicity. No effects on foetal development have been observed in rats and rabbits at the highest doses tested. However, it has not been possible to fully estimate exposure margins achieved for sofosbuvir in the rat relative to the exposure in humans at the recommended clinical dose. As a precautionary measure, it is preferable to avoid the use of this drug during pregnancy. When this drug is used in combination with ribavirin, it must not be used in women who are pregnant or suspected to be pregnant and their partners. Refer to the Prescribing information for ribavirin for additional information regarding use in pregnant women. 3) Breast feeding It is unknown whether sofosbuvir and its metabolites are excreted in human milk. Available pharmacokinetic data in animals has shown excretion of metabolites in milk. A risk to newborns/infants cannot be excluded. Therefore, this drug should not be used during breast feeding. 4) Fertility No human data on the effect of this drug on fertility are available. Animal studies do not indicate harmful effects on fertility.
8. USE IN PEDIATRICS: The safety and efficacy of this drug in children and adolescents aged <18 years have not yet been established. No data are available.
9. USE IN GERIATRICS: No dose adjustment is warranted for elderly patients.
10. USE IN RENAL IMPAIRMENT: No dose adjustment of this drug is required for patients with mild or moderate renal impairment. The safety and appropriate dose of this drug have not been established in patients with severe renal impairment (estimated glomerular filtration rate [eGFR] <30 mL/min/1.73 m2) or end stage renal disease (ESRD) requiring haemodialysis.
11. USE IN HEPATIC IMPAIRMENT: No dose adjustment of this drug is required for patients with mild, moderate or severe hepatic impairment (Child Pugh Turcotte [CPT] class A, B or C). The safety and efficacy of this drug have not been established in patients with decompensated cirrhosis.
12. EFFECTS ON ABILITY TO DRIVE AND USE MACHINES: This drug has moderate influence on the ability to drive and use machines. Patients should be informed that fatigue and disturbance in attention, dizziness and blurred vision have been reported during treatment with sofosbuvir in combination with peginterferon alfa and ribavirin (see 4. Undesirable effects).
13. MANAGEMENT OF OVERDOSAGE: The highest documented dose of sofosbuvir was a single supratherapeutic dose of sofosbuvir 1,200 mg administered to 59 healthy subjects. In that study, there were no untoward effects observed at this dose level, and adverse reactions were similar in frequency and severity to those reported in the placebo and sofosbuvir 400 mg treatment groups. The effects of higher doses are unknown. No specific antidote is available for overdose with this drug. If overdose occurs the patient must be monitored for evidence of toxicity. Treatment of overdose with this drug consists of general supportive measures including monitoring of vital signs as well as observation of the clinical status of the patient. Haemodialysis can efficiently remove (53% extraction ratio) the predominant circulating metabolite GS-331007. A 4-hour haemodialysis session removed 18% of the administered dose.
14. STORAGE AND HANDLING 1) Keep out of reach of children.2) Store in the original container.

▼Storage
Store in a tight container at room temperature (1-30°C)

▼Importer
Gilead Sciences Korea Ltd.
Euljiro 5-gil, Jung-gu, Seoul, Korea (Tel 02-6030-3330)

GILEAD

Prescription drug
Drug Classification No. 629

Date of preparation: 10 Sep 2015

※You can find the latest labelling and more information on the internet site of Gilead Sciences Korea (www.gileadkorea.co.kr) or Ministry of Food and Drug Safety (http://drug.mfds.go.kr).

OLYMPUS

Your Vision, Our Future

3D Imaging Solutions

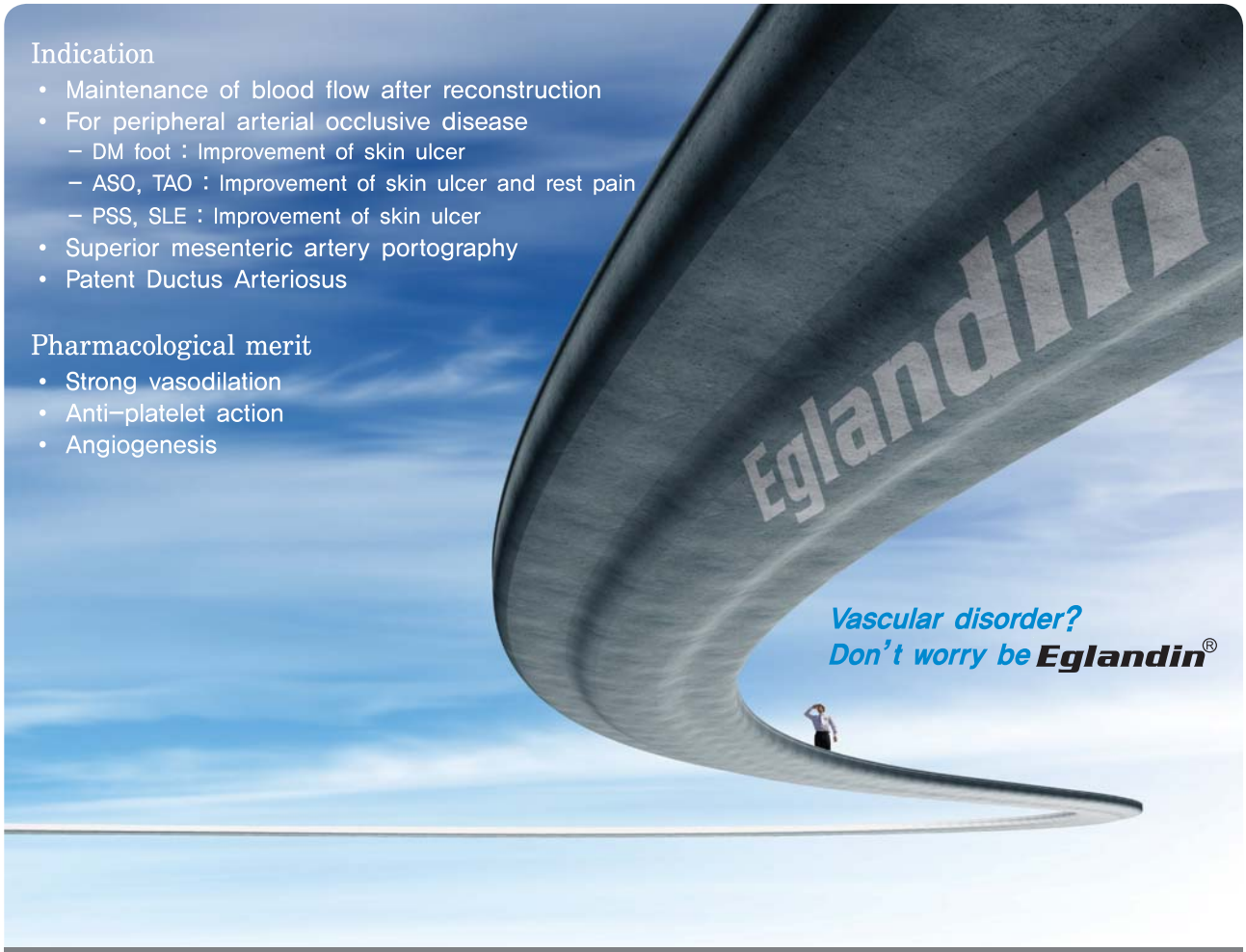
The only HD 3D system with a fully flexible direction of view

THUNDERBEAT

World's First Integration of Bipolar and Ultrasonic Technology

One Stop Solution

Setting New Standards Through Innovation



Lipo-prostaglandin E1 Eglandin® inj.

Pharmacological merit

- Strong vasodilation
- Anti-platelet action
- Angiogenesis

Mitsubishi Tanabe Pharma Korea

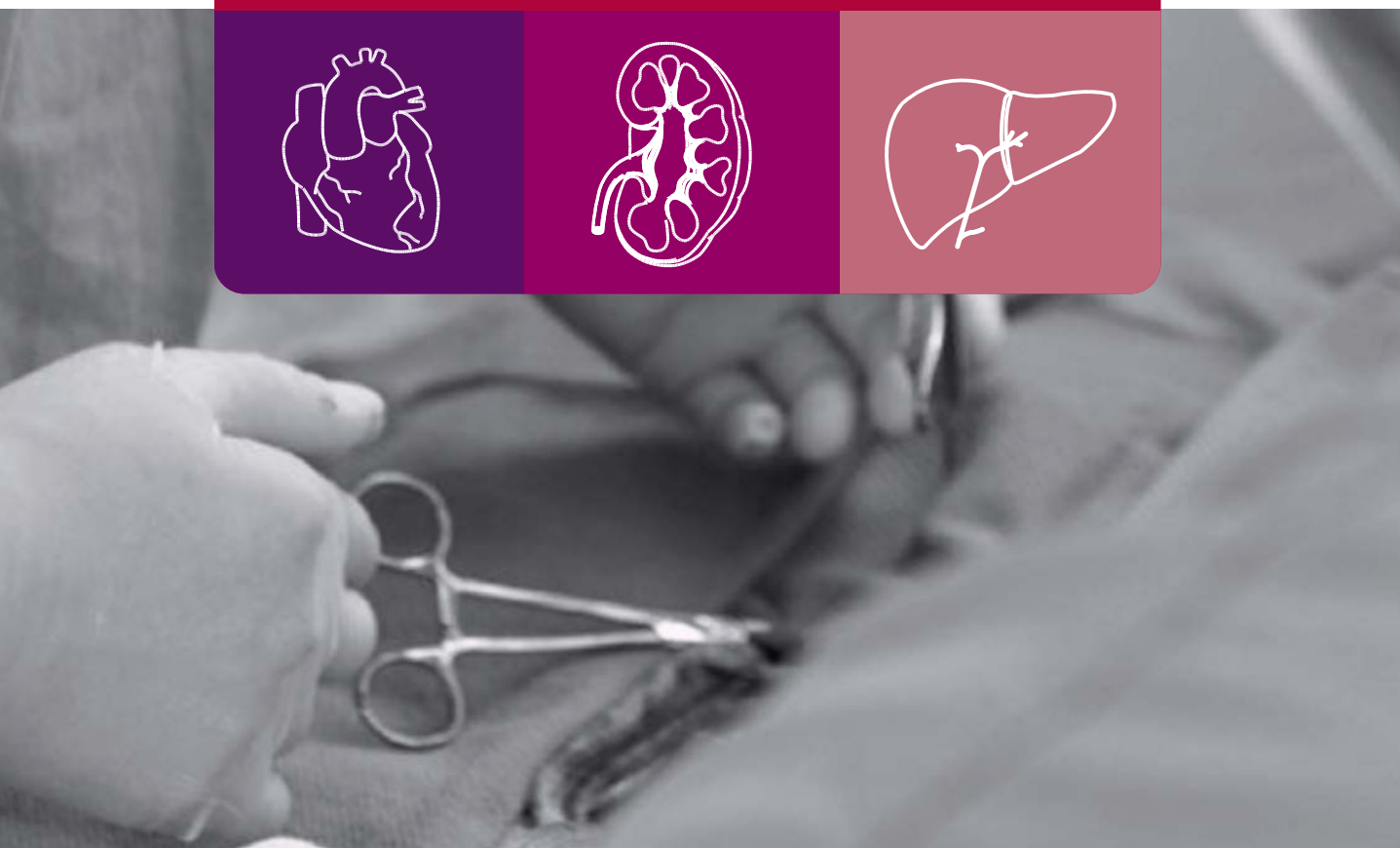
Hanmi Pharm. Co., Ltd.

Immunosuppressant

Myconol Cap.

250mg (Mycophenolate mofetil)

- Effective immunosuppresion in postimplantation
- FDA/EU DMF certification API (FDA/EU DMF)
- Excellence in Pharmacoeconomics



SK 플라즈마

정주용 헤파불린 에스앤 주

정맥주사용 B형 간염 사람면역글로불린

제품요약정보

전문의약품 분류번호 : 634

【제품명】 정주용 헤파불린에스앤주(정맥주사용 B형 간염 사람면역글로불린) **【원료약품 및 그 분량】** 1 바이알(10mL) 중 • 주성분 : B형간염사람면역글로불린(별규) 2,000I.U. **【성상】** 무색 또는 황갈색의 액이 무색투명한 바이알에 든 주사제 **【효능 · 효과】** 간이식환자에서 B형 간염의 재발 방지 **【용법 · 용량】** 다음의 투여 용량대로 10,000IU를 5% 포도당 주사액 150mL에 희석하여 점적 정맥주사 한다. • HBV-DNA(-), HBeAg(-) : 수술 중 10,000IU 1회 투여, 수술 후 1주일까지 10,000IU/day, 수술 후 1개월까지 10,000IU/week, 수술 후 1개월 이후 10,000IU/4weeks • HBV-DNA(+) 또는 HBeAg(+) : 수술 중 20,000IU 1회 투여, 수술 후 1주일까지 10,000IU/day, 수술 후 1개월까지 10,000IU/week, 수술 후 1개월 이후 10,000IU/4weeks **【사용상의 주의사항】** 1. 경고 1) 이 약은 사람혈장으로부터 제조되어 현재의 과학기술 수준에서 혈액 매개 바이러스 또는 다른 종류의 감염원(이론적으로는 CJD)의 감염 위험을 완전히 배제할 수 없다. 따라서 혈우병환자 또는 면역기능이 현저히 저하된 환자는 A형간염 백신 등 적절한 백신접종이 권장되며, 동제제 투여 시 의사는 정기적으로 감염여부를 모니터해야 한다. 또한 사람 혈액을 원재료로 하고 있는 것에 의한 감염증 전파의 위험을 완전히 배제할 수 없으므로 투여 시 환자에게 충분히 설명을 하고 질병 치료상의 필요성을 충분히 검토한 후에 필요한 최소한의 사용에 그치도록 한다. 2) 이 약 투여를 통한 혈전증 발생 위험은 완전히 배제할 수 없으며, 위험요인 및 투여경로에 무관하게 발생할 수 있다. 고령자 등 혈전증 발생 위험요인(고령, 장기간 부동상태, 과응고 상태, 정맥 또는 동맥 혈전증 병력, 에스트로겐 사용, 중심정맥카테터 삽입, 고점도 및 심혈관장애 위험요인)이 있는 환자의 경우, 가능한 최소농도를 최저주입속도로 신중 투여하여야 한다. 또한 투여 전 환자가 적절한 수분을 섭취할 수 있도록 하여야 하며, 투여 후 혈전증 증상 및 징후를 관찰하고 고점성 위험이 있는 환자의 혈액점성을 평가하는 등 환자의 상태를 관찰하여야 한다.

2015. 5. 1. 작성

※ 처방하기 전 제품설명서 전문을 참고하십시오. 최신 허가사항에 대한 정보는 '온라인의약도서관(http://drug.mfds.go.kr)'에서 확인할 수 있습니다.

SK 플라즈마 경기도 성남시 분당구 판교로 310(삼평동) www.skplasma.com 제품문의 080-969-9967

HPS-B1-201510-001

DAEWOONG

- Displacement of toxic bile acid
- Cytoprotective effects
- Immunomodulatory effects
- Stimulation of bile secretion

Composition

- Each tablet contains – Ursodeoxycholic acid(KP) ····· 100mg, 200mg, 300mg

Indication/Dosage and administration

OTC ■100mg Tab. : – Adjuvant therapy for liver disease due to insufficient bile secretion and biliary disease (gallbladder and biliary tract)
– Improvement of hepatic function in chronic liver disease
– Sequela of excision of small intestine and indigestion due to inflammatory small intestinal disease
– Gallstones
※For adults, usually 50–100mg t.i.d., Gallstones: 200mg t.i.d.

ETC ■200mg Tab. : – Gallstones: 200–250mg t.i.d.
– Primary biliary cirrhosis(PBC) : 200–300mg t.i.d.

ETC ■300mg Tab. : – Preventtion Gallstones During Weight Loss : 300mg b.i.d
– Primary biliary cirrhosis(PBC) : 300mg t.i.d.

※Inquiry calls: +82–80–550–8329

URSA®

Trust what you know

오랜 기간 전 세계적으로 입증한 그 가치[1–3]는 변하지 않습니다.

모든 이식환자를 향한 변함없는 가치, Original MMF, '셀셉트'가 함께합니다.

셀셉트® 캡슐 250mg

(미코페놀레이트모페틸)
전문의약품 / 분류번호 : 142

원료약품 및 그 분량 1캡슐(378mg)중 주성분 : 미코페놀레이트 모페틸(EP) ..... 250mg **캡슐제** : 상부담청색캡슐(KP) ..... 적량 (청색2호) **성상** 백색 내지 미백색의 가루가 충진된 상부 담청색, 하부 담갈색의 경질캡슐제 **효능 · 효과** 동종 신장, 심장, 간장 이식환자에 대한 급성 장기 거부반응 방지. 이 약은 신장, 심장 또는 간장 이식에서 시클로스포린 및 코르티코스테로이드와 병용 투여해야 한다. **용법 · 용량** 신장, 심장 또는 간장 이식 후 가능한 빨리 이 약 경구 투여를 시작하여야 한다. 1. 신장이식 ○ 성인 : 미코페놀산모페틸로서 1회 1g을 1일 2회 경구투여한다. 임상시험에서 1일 3g(1.5g씩 1일 2회) 사용은 유효성 · 안전성을 보여주었으나, 신장이식환자에서 유효성에 대한 우위성을 확립하지 못하였다. ○ 소아 및 청소년 : 이 약은 체표면적이 1.25m² 이상의 환자에게 투여한다. –25~–1.5m² : 이 약으로서 1회 750mg을 1일 2회(1일 1.5g) 경구투여한다. –1.5m² 초과 : 이 약으로서 1회 1.0g을 1일 2회(1일 2g) 경구투여한다. 성인과 비교 시 소아 및 청소년에서 이상반응이 더 빈번하게 발생하므로, 임시적인 용량 감소나 중단이 필요할 수 있다. 캡슐제를 개봉하거나 분쇄해서는 안된다(적절상의 주의항 참조). ○ 2세 미만 영아 : 2세 미만의 환자에 대한 안전성과 유효성 데이터는 제한적이므로 이 약의 사용은 권장되지 않는다. 2. 심장이식 ○ 성인 : 이 약으로서 1회 1.5g을 1일 2회(1일 용량 3g) 경구투여한다. 3. 간장이식 ○ 성인 : 이 약으로서 1회 1.5g을 1일 2회(1일 3g) 경구투여한다. 4. 특수군에서의 용법 · 용량 1) 중증 신부전 환자 : (1) 중증만성신부전(사구체 여과율 (25 mL/min/1.73 m²) 환자는 이식수술 직후가 아니면 이 약 1g을 1일 2회를 초과하여 투여하지 않는다. 이식수술 후 이식편기능이 지연되는 환자에서 용량을 조절할 필요는 없다. (2) 중증 만성신부전이 있는 심장 이식 환자에 대한 데이터는 없다. 이런 환자에서는 예상되는 유익성이 가능한 위험성을 상회하는 경우에만 이 약을 사용한다. 2) 고령자 : 고령자의 경우 현저 용량이 심장 이식 후 1g을 1일 2회, 심장 이식 후 1.5g 을 1일 2회, 심장 이식 후 1.5g 을 1일 2회 투여로 치료할 수 있다. 그러나 일반적으로 이들 고령자에서는 이상반응의 위험이 증가할 수 있다. 다른 면역억제제와 이 약을 병용 투여 받는 환자에서도 이상반응의 위험이 증가할 수 있다(이상반응 항 참조). 3) 중증의 간 실질부위 질환이 있는 신장 이식 환자에서는 용량을 조절할 필요가 없다. 중증의 간 실질부위 질환이 있는 심장 이식 환자에 대한 데이터는 없다. 호중구 감소증(ANC [절대호중구수] (1.3 x 10³/μl)이 관찰되면 이 약의 투여를 중지하거나 용량을 감소시키며, 적절한 진단검사를 실시하고 필요한 처치를 실시해야 한다. 5. 거부반응 기간 중 치료 : 신장이식 거부반응은 MPA의 약물동력학에 변화를 주지 않는다 ; 이 약의 중지 또는 감량이 필요하지 않다. 2015-06-04-rn-3

사용상의 주의사항 1. 경고 1) 임신의 가능성이 있는 여성 환자가 이 약을 복용할 경우에는 반드시 피임제를 사용해야 한다. 임신 기간 중 이 약을 복용하는 것은 유산 및 선천성 기형의 발생 위험의 증가와 관련이 있다. 2) 면역억제는 감염에 대한 감수성과 림프종 발생 가능성 증가를 초래할 수 있다. 이 약은 신장, 심장 또는 간장 이식환자의 면역억제 요법과 관리에 경험이 있는 전문의에 의해 처방되어져야 한다. 이 약을 투여받는 환자는 적절한 실험실과 의학적 지원시설 및 직원이 갖추어진 시설에서 관리되어야 한다. 유지치료를 담당하는 의사는 환자의 추적조사에 필요한 완벽한 정보를 갖고 있어야 한다. 3) 이 약에 함유되어 있는 인공감미제 아스파탐은 체내에서 분해되어 페닐알라닌으로 대사되므로, 페닐알라닌 섭취를 규제할 필요가 있는 유전성 질환인 페닐케톤노증 환자에는 투여하지 않는다(현탁액제에 한함). 2. 다음 환자에는 투여하지 말 것. 1) 이 약, 미코페놀산(mycophenolic acid, MPA), 또는 이 약의 구성성분에 과민반응 환자(이 약에 대한 알레르기 반응이 관찰되었다) 2) Lesch–Nyhan증후군, Kelley–Seegmiller증후군과 같은 HGPRT (Hypoxanthine –guanine phosphoribosyl–transferase)결손증 환자(inosine monophosphate dehydrogenase(IMPDH) 저해제들에 의해 그노산합성이 억제될 수 있다.). 3) 임부 또는 임신하고 있을 가능성이 있는 여성 4) 수유부 5) 이 약은 소르비톨을 함유하고 있으므로 유전성 과당 불내증이 있는 환자에게는 투여하지 않는다(현탁액에 한함). 3. **다음 환자에는 신중히 투여할 것.** 1) 중증 신부전 환자(혈중농도가 높아져 이상반응이 나타날 수 있다.) 2) 활동성 중증 소화기계 질환 환자(중증농도가 높아져 이상반응이 나타날 수 있다.) 3) 신장이식 후 장기기능저하자(주 환자(혈중농도가 높아져 이상반응이 나타날 수 있다.) **4. 적용상의 주의** 1) 이 약은 캡토리 토기에서 기형발생 작용이 나타났으므로 정제를 쪼개거나 분쇄해서는 안되며 캡슐제도 개봉하거나 분쇄해서는 안된다. 캡슐속에 들어있는 분말의 흡입 또는 피부나 점막과의 직접 접촉을 피해야 한다. 만일 접촉했을 경우에는 물과 비누로 완전히 씻어 내고 눈은 깨끗한 물로 세정하여야 한다. 2) 이 약은 약사가 다음과 같이 조제한 후 환자에게 투여해야 한다. (현탁액제에 한함) (1) 분말이 잘 풀어지도록 병을 닫은 상태에서 기밀성 뚜껑에 넣어져 두드린다. (2) 눈금이 매겨진 실린더를 이용해 94ml.의 물을 측정한다. (3) (2)에서 취한 물의 약 절반 정도를 병에 넣고 뚜껑을 닫은 상태에서 1분간 병을 잘 흔든다. (4) 남아 있는 물을 넣고 뚜껑을 닫은 상태에서 1분간 병을 잘 흔든다. (5) 어린이 보호용 뚜껑을 제거하고 어댑터로 병목을 눌러준다. (6) 어린이 보호용 뚜껑으로 병을 단단히 닫는다. (7) 병 라벨에 조제한 현탁용제의 유효기간을 적는다(조제한 후 실온(1~30℃) 2개월)

1) 보다 자세한 제품정보 및 제품관련 유해사례보고는 (주)한국로슈 (02-3451-3600)로 문의 하시기 바랍니다. 2) 가장 최신 제품설명서는 ㈜한국로슈 홈페이지 (www.roche.co.kr)에서 확인하실 수 있습니다.

Reference 1. Data on file 2. van Gelder T, Hesselink DA. Mycophenolate revisited. Transpl Int 2015;28(5):508-15 3. Ekberg H, Tedesco-Silva H, Demirbas A, et al. Reduced exposure to calcineurin inhibitors in renal transplantation. N Engl J Med. 2007;357:2562-3575

셀셉트® 현탁용분말 1그람/5밀리리터

(미코페놀레이트모페틸)
전문의약품 / 분류번호 : 142

원료약품 및 그 분량 이 약 110g(용제 94ml에 용해) 당 주성분 : 미코페놀레이트모페틸(벌규) ..... 34.980g 보존제 : 파라옥시안식향산에틸(EP) ..... 0.528g **성상** 환색의 과일도롤리에밀련 용기에 담겨진 환색 또는 미백색의 분말 **효능 · 효과** 동종 신장, 심장, 간장 이식환자에 대한 급성 장기 거부반응 방지. 이 약은 신장, 심장 또는 간장 이식에서 시클로스포린 및 코르티코스테로이드와 병용 투여해야 한다. **용법 · 용량** 신장, 심장 또는 간장 이식 후 가능한 빨리 이 약 경구 투여를 시작하여야 한다. 1. 신장이식 ○ 성인 : 미코페놀산모페틸로서 1회 1g(현탁액으로써 5mL)을 1일 2회 경구투여한다. 임상시험에서 1일 3g(1.5g씩 1일 2회) 사용은 유효성 · 안전성을 보여주었으나, 신장이식환자에서 유효성에 대한 우위성을 확립하지 못하였다. ○ 소아 및 청소년 : 미코페놀레이트모페틸로서 1회 600mg/m² 을 1일 2회 750mg을 1일 2회(1일 1.5g) 경구투여한다. –1.5m² 초과 : 이 약으로서 1회 1.0g을 1일 2회(1일 2g) 경구투여한다. 성인과 비교 시 소아 및 청소년에서 이상반응이 더 빈번하게 발생하므로, 임시적인 용량 감소나 중단이 필요할 수 있다. ○ 2세 미만 영아 : 2세 미만의 환자에 대한 안전성과 유효성 데이터는 제한적이므로 이 약의 사용은 권장되지 않는다. 2. 심장이식 ○ 성인 : 이 약으로서 1회 1.5g을 1일 2회(1일 용량 3g) 경구투여한다. 3. 간장이식 ○ 성인 : 이 약으로서 1회 1.5g을 1일 2회(1일 3g) 경구투여한다. 4. 특수군에서의 용법 · 용량 1) 중증 신부전 환자 : (1) 중증만성신부전(사구체 여과율 (25 mL/min/1.73 m²) 환자는 이식수술 직후가 아니면 이 약 1g을 1일 2회를 초과하여 투여하지 않는다. 이식수술 후 이식편 기능이 지연되는 환자에서 용량을 조절할 필요는 없다. (2) 중증 만성신부전이 있는 심장 이식 환자에 대한 데이터는 없다. 이런 환자에서는 예상되는 유익성이 가능한 위험성을 상회하는 경우에만 이 약을 사용한다. 2) 고령자 : 고령자의 경우 현저 용량이 심장 이식 후 1g을 1일 2회, 심장 이식 후 1.5g 을 1일 2회 투여로 치료할 수 있다. 그러나 일반적으로 이들 고령자에서는 이상반응의 위험이 증가할 수 있다. 다른 면역억제제와 이 약을 병용 투여 받는 환자에서도 이상반응의 위험이 증가할 수 있다(이상반응 항 참조). 3) 중증의 간 실질부위 질환이 있는 신장 이식 환자에서는 용량을 조절할 필요가 없다. 중증의 간 실질부위 질환이 있는 심장 이식 환자에 대한 데이터는 없다. 호중구 감소증(ANC [절대호중구수] (1.3 x 10³/μl)이 관찰되면 이 약의 투여를 중지하거나 용량을 감소시키며, 적절한 진단검사를 실시하고 필요한 처치를 실시해야 한다. 5. 거부반응 기간 중 치료 : 신장이식 거부반응은 MPA의 약물동력학에 변화를 주지 않는다 ; 이 약의 중지 또는 감량이 필요하지 않다. 2015-06-04-rn-3

사용상의 주의사항 1. 경고 1) 임신의 가능성이 있는 여성 환자가 이 약을 복용할 경우에는 반드시 피임제를 사용해야 한다. 임신 기간 중 이 약을 복용하는 것은 유산 및 선천성 기형의 발생 위험의 증가와 관련이 있다. 2) 면역억제는 감염에 대한 감수성과 림프종 발생 가능성 증가를 초래할 수 있다. 이 약은 신장, 심장 또는 간장 이식환자의 면역억제 요법과 관리에 경험이 있는 전문의에 의해 처방되어져야 한다. 이 약을 투여받는 환자는 적절한 실험실과 의학적 지원시설 및 직원이 갖추어진 시설에서 관리되어야 한다. 유지치료를 담당하는 의사는 환자의 추적조사에 필요한 완벽한 정보를 갖고 있어야 한다. 3) 이 약에 함유되어 있는 인공감미제 아스파탐은 체내에서 분해되어 페닐알라닌으로 대사되므로, 페닐알라닌 섭취를 규제할 필요가 있는 유전성 질환인 페닐케톤노증 환자에는 투여하지 않는다(현탁액제에 한함). 2. 다음 환자에는 투여하지 말 것. 1) 이 약, 미코페놀산(mycophenolic acid, MPA), 또는 이 약의 구성성분에 과민반응 환자(이 약에 대한 알레르기 반응이 관찰되었다) 2) Lesch–Nyhan증후군, Kelley–Seegmiller증후군과 같은 HGPRT (Hypoxanthine –guanine phosphoribosyl–transferase)결손증 환자(inosine monophosphate dehydrogenase(IMPDH) 저해제들에 의해 그노산합성이 억제될 수 있다.). 3) 임부 또는 임신하고 있을 가능성이 있는 여성 4) 수유부 5) 이 약은 소르비톨을 함유하고 있으므로 유전성 과당 불내증이 있는 환자에게는 투여하지 않는다(현탁액에 한함). 3. **다음 환자에는 신중히 투여할 것.** 1) 중증 신부전 환자(혈중농도가 높아져 이상반응이 나타날 수 있다.) 2) 활동성 중증 소화기계 질환 환자(중증농도가 높아져 이상반응이 나타날 수 있다.) 3) 신장이식 후 장기기능저하자(주 환자(혈중농도가 높아져 이상반응이 나타날 수 있다.) **4. 적용상의 주의** 1) 이 약은 캡토리 토기에서 기형발생 작용이 나타났으므로 정제를 쪼개거나 분쇄해서는 안되며 캡슐제도 개봉하거나 분쇄해서는 안된다. 캡슐속에 들어있는 분말의 흡입 또는 피부나 점막과의 직접 접촉을 피해야 한다. 만일 접촉했을 경우에는 물과 비누로 완전히 씻어 내고 눈은 깨끗한 물로 세정하여야 한다. 2) 이 약은 약사가 다음과 같이 조제한 후 환자에게 투여해야 한다. (현탁액제에 한함) (1) 분말이 잘 풀어지도록 병을 닫은 상태에서 기밀성 뚜껑에 넣어져 두드린다. (2) 눈금이 매겨진 실린더를 이용해 94ml.의 물을 측정한다. (3) (2)에서 취한 물의 약 절반 정도를 병에 넣고 뚜껑을 닫은 상태에서 1분간 병을 잘 흔든다. (4) 남아 있는 물을 넣고 뚜껑을 닫은 상태에서 1분간 병을 잘 흔든다. (5) 어린이 보호용 뚜껑을 제거하고 어댑터로 병목을 눌러준다. (6) 어린이 보호용 뚜껑으로 병을 단단히 닫는다. (7) 병 라벨에 조제한 현탁용제의 유효기간을 적는다(조제한 후 실온(1~30℃) 2개월)

1) 보다 자세한 제품정보 및 제품관련 유해사례보고는 (주)한국로슈 (02-3451-3600)로 문의 하시기 바랍니다. 2) 가장 최신 제품설명서는 ㈜한국로슈 홈페이지 (www.roche.co.kr)에서 확인하실 수 있습니다.

Reference 1. Data on file 2. van Gelder T, Hesselink DA. Mycophenolate revisited. Transpl Int 2015;28(5):508-15 3. Ekberg H, Tedesco-Silva H, Demirbas A, et al. Reduced exposure to calcineurin inhibitors in renal transplantation. N Engl J Med. 2007;357:2562-3575

Roche 주식회사 한국로슈
서울특별시 서초구 서초대로 411 GT Tower (East) 16-17층 (우:137-856)
TEL: 02)3451-3600 FAX: 02)561-7201

CellCept®
mycophenolate mofetil
Trust what you know

MC2015091O-011

CERTICAN®
everolimus

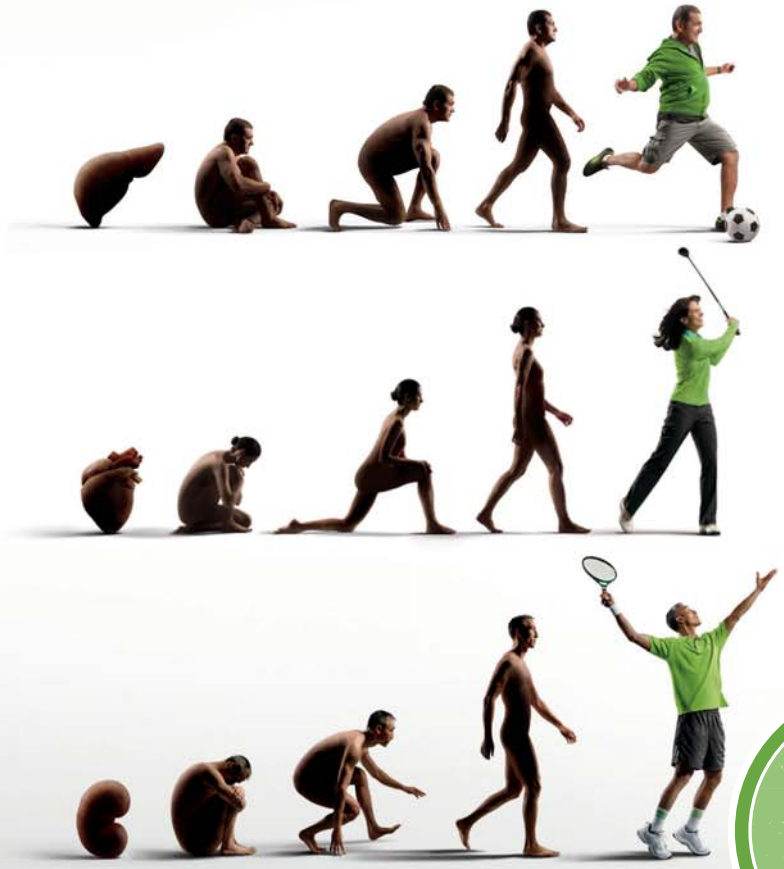
Protect today.Advance tomorrow.

START WITH CERTICAN TODAY, ADVANCE TRANSPLANT OUTCOMES TOMORROW

심장, 신장, 간에 모두 적응증을 가진 유일한* mTOR 억제제[1,2,3],

써티칸®정!

써티칸®과 저용량 CNI 병용을 통한
충분한 면역억제 효과 및 위험 요인의 효과적 관리[4,5,6],
이제 이식 환자의 건강한 삶의 연장이 시작됩니다.



심장이식에 이어
간이식 후
장기 거부반응 예방
(2015년 6월 1일부로 적용)

보험급여 인정[7]

Ref 1. 써티칸 정 제품설명서 2. 시롤리무스 국내 허가사항 3. 템시롤리무스 국내 허가사항 4. H. J. Eisena, J. Kobashigawab, Starling R C et al. Am J Trans. 2013; 13: 1093–1216 5. Saliba F, Simone P D , Nevens F et al. Am J Trans 2013; 13: 1734–1745 6. Silva H T Jr. , Cibrikb D, Johnstonc T et al. Am J Trans 2010; 10: 1401–1413 7. 보건복지부 고시 제 2015-81호 *국내 허가사항 기준

써티칸®정 0.25, 0.5, 0.75, 1.0밀리그램 (에베로리무스)

[주성분] 에베로리무스 **[효능·효과]** 1) 경도 내지 중등도의 면역학적 위험을 가진 동종 신장 또는 심장 이식을 받은 성인 환자에서 이식 후 장기 거부반응의 예방. 신장 및 심장 이식에서 사용 시 이 약은 마이크로에멀전 제형의 사이클로스포린 및 코르티코스테로이드와 병용하여 투여한다. 2) 간 이식을 받은 성인 환자에서 이식 후 장기 이식 거부 반응의 예방. 간 이식에서 사용 시, 이 약은 타크로리무스 및 코르티코스테로이드와 병용해서 투여한다. **[용법·용량]** 성인 – 이 약은 신장과 심장이식 환자에게 이식 후 가능한 빠른 시간 내에 초기용량으로 1회 0.75mg을 1일 2회 경구 투여(1일 총 1.5mg) 한다. 간 이식 환자에게 이식 후 약 4주째에 초회 용량으로 1.0mg을 1일 2회 (1일 총 2.0mg) 경구 투여 한다. 간기능장애 환자에서 에베로리무스의 전혈 중 최저 농도를 면밀히 모니터링 해야 한다. 경증의 간기능장애 환자에서 용량은 정상 용량의 약 2/3로 감량되어야 한다. 중등도 간기능장애 환자에게 투여할 때는 정상 용량의 약 1/2까지 감량해야 하며 중증의 간기능장애 환자에게 투여할 때는 정상 용량의 약 1/3까지 감량해야 한다. 18세 미만의 소아에 대한 안전성 유효성이 확립되지 않았다. **[금기]** 에베로리무스, 시롤리무스 또는 이 약의 다른 성분들에 알러지 과민성이 있는 환자, 갈락토오스 불내성(galactose intolerance), Lapp 유당분해효소 결핍증(Lapp lactase deficiency) 또는 포도당-갈락토오스 흡수 장애(glucose-galactose malabsorption)등의 유전적인 문제가 있는 환자 **[경고]** 칼시뉴린 억제제를 계속해서 투여한 환자와 비교했을 때 칼시뉴린 억제제의 투여를 중단한 환자에서 급성거부반응 발생 위험의 증가가 관찰되었다. 치모글로불린/토끼 항-흉선세포 글로불린) 유도제를 이 약/사이클로스포린/스테로이드 요법과 병용 투여하는 것은 주의하여야 한다. 림프종 또는 다른 악성종양, 특히 피부에서의 종양 발생위험이 증가한다. 면역 억제제를 투여받고 있는 환자는 특히 기회감염성 병원균(세균성, 진균성, 바이러스성, 원충성)에 의한 감염의 위험이 증가할 수 있다. 면역이 억제된 환자들에서 신장 이식 소실을 일으킬 수 있는 BK 바이러스 연관성 신장병증 및 잠재적으로 치명적인 JC 바이러스 연관성 진행다발성백질뇌증(PML)을 포함한 폴리오마바이러스 감염이 나타날 수 있다. 이 약은 혈관 부종 발생과 연관이 있었고 보고된 환자의 다수가 이 약과 함께 ACE 저해제를 투여받았다. 장기 이식 환자에서 칼시뉴린 저해제와 함께 이 약을 사용하는 것은 단백뇨를 증가시킬 있으며, 경증의 단백뇨가 있는 신장 이식 환자에서 칼시뉴린 억제제를 이 약으로 대체할 때 단백뇨가 악화되는것이 보고되었다. 신기능 이상을 피하기 위해 감량된 사이클로스포린과 함께 이 약을 사용하는 것이 필요하다. 간 이식 임상 시험에서 이 약과 감량된 타크로리무스의 병용은 정상 용량 타크로리무스 투여와 비교했을 때 신기능을 악화시키지 않는 것이 관찰되었다. 장기적으로 이 약 및 사이클로스포린의 혈중 농도, 단백뇨 및 신기능에 대한 모니터링이 권고된다. 치료상 이점이 위험을 상회하지 않는 한, 강력한 CYP3A4-저해제와 유도제의 병용투여는 권장되지 않는다. 이식 소실을 유발하는 신장 동맥 및 정맥 혈전증의 위험 증가는 대부분이 이식 후 첫 30 일 이내에 보고되었다. 다른 mTOR 저해제와 같이 이 약은 이식 후 합병증의 발생을 증가시켜 치료를 약화할 수 있다. 신장 이식 환자에서 가장 빈번하게 보고된 림프낭종은 더 높은 체질량 지수를 보이는 환자에서 더 빈번하게 나타나는 경향이 있다. 심낭 및 흉막 삼출의 발생 빈도는 심장 이식 환자에서 증가하였으며 잠재성 헤르니아의 발생 빈도는 간이식 환자에서 증가하였다. 칼시뉴린 저해제와 이 약을 함께 사용하는 것은 칼시뉴린 저해제 유도성 혈전성 미세 혈관 병증 / 혈전성 혈소판 감소성 자반증 / 용혈성 요독성 증후군의 위험을 증가시킬 수 있다.

처방하시기 전, 상세 제품정보를 참조하시기 바랍니다.

KR1401T08697

NOVARTIS PHARMACEUTICALS

서울시 중구 통일로 10 연세재단 세브란스빌딩18층 TEL: 080-768-0800 FAX: 02-785-1939 www.novartis.co.kr / www.novaMD.co.kr

Chong Kun Dang Pharm. Seoul, Korea

"TacroBell®"

aiming at global medicine

TacroBell® Cap.

(Tacrolimus 0.25 / 0.5 / 1mg)

- 0.25mg strength launched for the first time in the world
- Patented using newly developed concept of Solid Dispersion technology
- Biological equivalence proved through clinical trials
- Efficacy and safety proved by Phase IV clinical trials to patients of kidney or liver transplantation

Participation hospitals in clinical trials:
Asan Medical Center, Chonbuk National University Hospital, Chonnam National University Hospital, Samsung Medical Center, Seoul National University Hospital, Seoul St. Mary's Hospital, Severance Hospital, Hallym University Medical Center, Hanyang University Medical Center, Keimyung University Dongsan Medical Center(listed in alphabetical order)

녹십자
GREEN CROSS

I.V.-Hepabig inj.

Hepatitis B Immune Globulin

[원료약품의 분량 - 1Vial 중 주성분] B형 간염 사람면역글로불린 - 2,000 I.U.
[효능·효과] 간이식 환자의 B형 간염 재발의 예방 **[용량]** 10ml/vial **[포장단위]** 10ml/vial X 1, 10
[저장방법] 밀봉용기, 2~8℃에서 냉장보관 **[유효기간]** 제조일로부터 30개월

◎ 대표전화 031-260-9300 / www.greencross.com

정주용 B형 간염 사람면역글로불린
I.V.-Hepabig inj.

ILDLT Study Group 2015 Secretariat

PCO Insession International Convention Services, Inc.

Tel +82-2-3471-8555 **Fax** +82-2-521-8683 **E-mail** ldltstudygroup@insession.co.kr