TRANSPLANT
INTERNATIONAL

# 023 KIDNEY

V1

## SURGICAL TREATMENT FOR CHYLOUS ASCITES AFTER LAPAROSCOPIC DONOR NEPHRECTOMY

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**Background:** Chylous ascites (CA) after laparoscopic live donor nephrectomy (LLDN) is a rare but serious complication that may lead to significant morbidity. The aim of this study is to determine the incidence, clinical presentation, conservative management options of CA and their outcomes while the video is aimed to demonstrate anatomic landmarks and detailed surgical technique of this uncommon laparoscopic operation which is not well defined in the literature.
**Methods/Materials:** Data from 1453 consecutive LLDN carried out between February 2007 and March 2015 at two institutions by the same surgery team were evaluated. All of the donor operations were carried out in hand assisted or full laparoscopic fashion. When CA was diagnosed, a peritoneal drainage catheter was placed in all of the patients.
**Results:** Clinical CA developed in 4 (% 0.27) of 1453 donors. 2 (50%) donor operations were hand assisted, 2(50%) were full laparoscopic. Clinical presentation of CA was 14.4 $\pm$ 5.4 days after LLDN. Initial daily drainage from the peritoneal catheters was 568 $\pm$ 256 ml. 1 patient was treated with low fat diet with medium chain triglycerides and 2 patients were treated with strict nil per os (NPO), total parenteral nutrition (TPN) and somatostatin analogues (SA). Standard dose SA was unsuccessful and dose escalation to 1200 $\mu$g/day was required in one of these patients. Conservative treatment for 29 days failed in 1 patient and successful laparoscopic surgery was done for treating CA. Laparoscopic surgery using previous port sites included meticulous dissection of aorta, superior mesenteric artery, right renal artery, clipping of lymphatic vessels, suturing of cysterna chyli and covering the surgical field with pressurized fibrin sealant spray.
**Conclusion:** When conservative treatment for CA fails, surgical treatment is warranted. A meticulous laparoscopic operation using the anatomical landmarks can successfully treat this challenging complication.

**025 LIVER**

V2

## A NOVEL BILIARY RECONSTRUCTION TECHNIQUE FOR LIVING DONOR LIVER TRANSPLANTATION – USING GLISSONIAN SHEATH IN THE ANASTOMOSIS

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**Background:** Biliary complications are the most common cause of morbidity after living donor liver transplantation. The incidence of biliary complication rangs from 5% to 15% in deceased donor liver transplantation, and 20% to 34% in living donor liver transplantation.
**Methods:** We present a new method of biliary anastomosis by using graft Glisson's sheath to connect the recipient bile duct. The advantages include prevention of suture-induced stricture, avoiding compromising of blood supply and easily anastomosis with bile duct of size-mismatch and multiple orifices.
**Results:** From May 2014 to December 2014, there were 39 patients who received liver transplantation surgery in our hospital under the new biliary reconstruction method. Two out of thirty-nine patients experienced biliary leakage. The other one patient experienced biliary stricture who needed Endoscopic Retrograde Biliary Drainage. The total biliary complication rate of this new technique is about 7.7%.
**Conclusion:** With using of Glisson's sheath provides an alternative solution for difficult stump in biliary reconstruction.

**019 ISCHEMIA/REPERFUSION INJURY/PRESERVATION**

V3

## SUB-NORMOTHERMIC OXYGENATED MACHINE PERFUSION AMELIORATED RECIPIENT SURVIVAL AFTER MOUSE LIVER TRANSPLANTATION USING DCD GRAFTS

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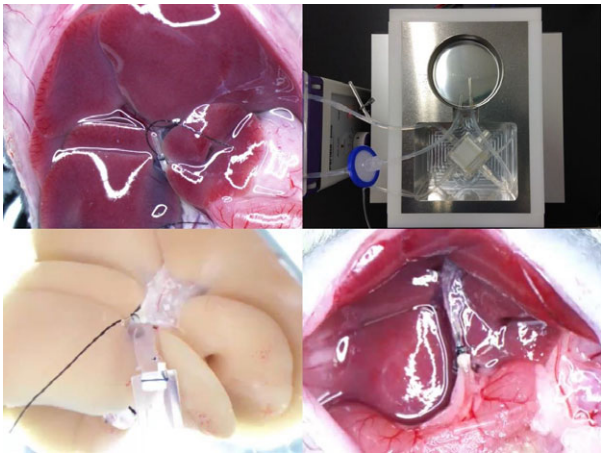
**Background:** In the expansion of the donor pool, machine perfusion is considered a key technology for the safety utilization of liver grafts from high-risk donors including donors after cardiac death (DCD).We developed a novel *ex-vivo* liver perfusion machine for mice that achieved oxygenated perfusion at a wide range of temperatures and introduced the machine perfusion method into the mouse orthotopic liver transplantation (MOLT) model.
**Methods:** We applied the sub-normothermic oxygenated machine perfusion (SOPE) method to the MOLT model using DCD grafts in this study. C3H mice were used for both the donor and the recipient. The donor mice were euthanized by an incision of the diaphragm under inhalant anesthesia and left for 35 min without any treatment under room temperature. After the harvest of liver grafts, backtable procedures were performed at 4°C, and then machine perfusion and rewarming to 20°C were started simultaneously. The recipient operation was started 120 min after the beginning of SOPE and SOPE was continued until just before the put-in. In the recipient operation, the supra-hepatic vena cava was anastomosed with a running suture, the portal vein and the infra-hepatic vena cava were anastomosed with cuff technique, and the bile duct was reconstructed with the stent technique. In the control group, the liver grafts were preserved by conventional cold-static (CS) method with UW solution.
**Results:** We performed SOPE-MOLT for a case group ($n = 2$) and CS-MOLT for a control group ($n = 2$) using DCD grafts. While all mice died before recovery from anesthesia in the control group, the recipient mice survived for 5 and 10 days respectively after the operations in the case group.
**Conclusion:** SOPE ameliorated recipient survival after mouse liver transplantation using DCD grafts.



**025 LIVER**

V4

## A FIRST CASE OF DONOR HEPATECTOMY USING A LEFT TRI-SECTION (LEFT HEPATECTOMY EXTENDED TO RIGHT ANTERIOR SECTOR)

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**Background:** For living donor liver transplantation, right liver grafts have been commonly used to meet the metabolic demands of the recipient. However, a small, remnant left liver volume sometimes limits its use for donor safety concerns. Here, we report an innovative donor hepatectomy using a left tri-section (left hepatectomy extended to right anterior sector).
**Methods/Materials:** We retrospecitively reviewed the patient's medical records.
**Results:** The donor was a 46-year-old man, who would have an 28.5% left remnant liver volume after donating his right liver, but a left tri-section successfully secure a 30.3% remnant right posterior section volume. Anatomic variation of the bile duct also favored left tri-sectionectomy because the right posterior hepatic duct drained into the common bile duct, therefore, we performed left tri-sectionectomy. During the operation, a transfusion was not required, and the donor was discharged without any surgical complications.
**Conclusion:** The left tri-section grafts can be considered for donors who are unsuited for right liver donation.

**023 KIDNEY**

## V5 LAPAROSCOPIC NEPHRECTOMY FOR LIVING KIDNEY DONOR WITH PRIOR LAPAROTOMY

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**Background:** Laparoscopic nephrectomy for renal transplantation has become standard operation in Europe as well as the United States, since it provides faster recovery and return to the donor's everyday activities.

**Methods/Materials:** We present a case of a 68-year-old male, living kidney donor, who had undergone exploratory laparotomy following a car accident 1 year before laparoscopic nephrectomy. The patient was placed in the typical left decubitus position for nephrectomy. Two 5 mm trocars, and a 10 mm one were placed to the left midclavicular line, between the costal cartilage and the anterior superior iliac spine, in order to achieve triangulation. A 10 mm trocar was placed suprapubically and was replaced by a gel-port for the graft's removal. Laparoscopic nephrectomy was performed, following symphysiolysis. Operative time was 3 h. Time of warm ischemia was 3 min.

**Results:** The recipient presented immediate diuresis. The donor had an uneventful recovery and was discharged four days later.

**Conclusion:** Laparoscopic approach seems to be safe for live kidney donors, even in cases of prior laparotomy. It is related to less pain, fewer complications and shorter hospitalization. The time of warm ischemia does not seem to affect the graft's function. The donor returned to his everyday activity six days post-operatively.

**005 COMPOSITE TISSUES**

## V6 EXPERIMENTAL UTERUS TRANSPLANT: AN UP TO DATE AUDIO-VISUAL REVIEW

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**Background:** The uterus transplant project has been investigated on both animal and human experimental transplant models. The project is an up to day audio-visual review, accompanied by a monograph about the achievements in the uterus experimental and clinical transplant.

**Material and Methods:** The research is based on bibliographical and experimental data referring to: a. anatomic, b. operational issues, c. immunosuppression modalities, d. rejection reasoning and to e. preservation techniques of the uterus experimental transplant to the present.

**Results:** The experimental work by Brannstrom et al. as well as by other groups which performed successful experimental allotransplants and achieved term pregnancy and delivery of several types of experimental animals is analyzed. In addition, the first two clinical human uterine transplants which performed by Fageeh et al. and by Ozkan and Akar et al. and their outcomes, are referred. The work of the Gothenburg group which has culminated in a clinical trial led by Brannstrom and Olausson et al. is also analysed. In the end, the remote evaluation of the uterus graft for pre-transplant decision support and planning is suggested as new perspectives and advances in the field for the fulfilment of all complex medico-ethical and legal issues in the future.

**Conclusion:** The uterine experimental cluster transplant is a complex project with a scientifically, ethically and legally demanding prospect, which has succeeded by giving the first birth from a transplanted womb on a clinical level.

**023 KIDNEY**

V7

## RENAL AND IMMUNOLOGICAL OUTCOMES OF HIGHLY SENSITISED HLA-INCOMPATIBLE HEART-KIDNEY TRANSPLANTED PATIENTS WITH POSITIVE CDC CROSSMATCH

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**Background:** The outcome of highly sensitised HLA-incompatible heart-kidney transplant recipients with positive CDC crossmatch is not well defined. **Results:** Four highly-sensitised females received combined heart- kidney transplants, a between January 2012 and December 2014. All had a positive CDC crossmatch (IgG, T and B). Mean age was 41.5 years (31–58), Mean donor age was 36 years (18 National and Kapodistrian University of Athens, Medical School, 57). Mean mismatch number was 7 (6 National and Kapodistrian University of Athens, Medical School, 8). Follow-up duration was 17 months (8–28). Immunisation was secondary to transfusions in 25% of cases, pregnancies in 50% of cases and previous heart transplantation in 50% of cases. Desensitisation protocols consisted of plasma exchange (PE) combined with intravenous immunoglobulins (IvIg) in 100% of cases, and Rituximab in 50% of cases. All patients had perioperative PE. Postoperatively patients had a mean of 7.7 PE sessions (5 National and Kapodistrian University of Athens, Medical School, 10). Donor-specific antibodies (DSA) were detected in recipient sera at the day of transplant in all cases. Class I antibodies had a mean MFI score of 3476 (500 National and Kapodistrian University of Athens, Medical School, 14 000) and class II antibodies had a mean MFI score of 4192 (706–13 967). During follw- up, DSA score decreased in 50% of patients and persisted at high levels in 50% of cases. Mean serum creatinine was 104 μmol/l at 6 months and 125 μmol/l at 1 year. (CKD-EPI: 65 ml/min at 6 months and 52.67 ml/min at 1 year). Mean proteinuria was 0.12 g/24 h at 6 months and 0.13 g/24 h at 1 year. Renal biopsies were performed in 50% of patients and did not show any rejection pattern. One patient had a microinflammation score g + cpt = 3, but did not receive a specific treatment. Monthly heart biopsies did not show any rejection pattern. Graft and patient survival was 100% at 1 year. **Conclusion:** With the limits of a small cohort and short- term follow-up, combined heart-kidney transplant seems feasible in highly sensitised patients with a positive crossmatch.

**033 TISSUE ENGINEERING**

V8

## OPTIMIZED DECELLULARIZATION OF RAT LIVERS BY ARTERIAL AND PORTAL VENOUS PERFUSION UNDER OSCILLATING PRESSURE CONDITIONS

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The decellularization and recellularization of livers is a promising approach to generate functional livers *in vitro*. Until now several protocols for rodent liver decellularization have already been published. However, we aimed to improve homogeneity and duration of the decellularization process by selective perfusion via the portal vein and/or the hepatic artery. A liver harvesting technique to cannulate the portal vein and the hepatic artery was developed and a proprietary perfusion device to enable selective perfusion was constructed. Furthermore, perfusion was performed under oscillating surrounding pressure conditions to mimic the intraabdominal pressure changes that occur during respiration to further optimize the microperfusion of the liver. We hypothesized that surrounding oscillating pressure conditions during decellularization can minimize disintegrating effects of alkaline detergents to the extracellular matrices (ECM) and optimize homogeneity of decellularization. In the study presented here, decellularized rat liver matrices were analyzed by histological staining, biochemical analysis, corrosion casting and CT examination. Decellularization via the hepatic artery showed more homogenous results compared to portal venous perfusion. The application of oscillating pressure conditions improved the effectiveness of perfusion decellularization. Livers perfused via the hepatic artery and under oscillating pressure conditions showed the best results. The developed techniques for liver harvesting, cannulation and perfusion using our proprietary device enable sophisticated decellularization, recellularization and perfusion set-ups.

**023 KIDNEY**

## V9 RIGHT-SIDED DONOR NEPHRECTOMY WITH HAND-ASSISTED RETROPERITONEOSCOPIC APPROACH OFFERS INCREASED SAFETY WITH EXCELLENT OUTCOME

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Laparoscopic donor nephrectomy (DN) has become the gold standard for living kidney donation. Recently, hand assisted retroperitoneoscopic (HARP) approach was introduced as a safe alternative, which has become the preferred surgical technique in our institution. We designed this retrospective cohort study to assess the outcome of HARP approach in right-sided DN.

Between February 2009 and December 2014, we performed 86/455 (18.9%) right-sided HARP procedures. The retroperitoneum was entered via the hand-port which was placed either through the paramedian ($n = 82$) or Pfannenstiel ($n = 4$) incision. All procedures were performed using two 12 mm trocars except the first case where an extra trocar was inserted for liver retraction. The camera was introduced from subxyphoid trocar and endoscopic instruments were introduced through the trocar inserted through the anterior axillary line right below the 12th rib.

The median age and BMI of donors were 47.5 (35.5–56.0) and 27.4 (24.3–29.5), respectively. The main reasons for selecting the right kidney included multiple vessels on the left side and the presence of cysts and stones on the right side. Fourteen (16.3%) donors had multiple arteries on the right side. The median surgical dissection time was 92.5 (78.7–120.0) minutes, which was significantly longer in the first half of cases compared to the second half performed after January 2012 ($121 \pm 43$ vs. $82 \pm 32$ min, $p < 0.001$). None of the donors required conversion to open surgery or blood transfusion. The most common complication was the peritoneal opening ($n = 21$). In a median follow-up of 39.0 (17.0–53.2) months, none of the donors developed late complications.

The HARP technique is a valuable alternative for right-sided DN, which allows direct approach to renal pedicle without the need of liver retractor and combines the safety of hand assistance and the benefits of protecting the integrity of peritoneal cavity to avoid intraperitoneal complications.

**025 LIVER**

## V10 SPLENIC ARTERY TRANSPOSTION FOR ARTERIAL RECONSTRUCTION IN LIVING DONOR LIVER TRANSPLANTATION: A PERFECT SUBSTITUTE

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In living donor liver transplantation (LDLT), unsuitability of recipient hepatic artery (HA) branches for arterial reconstruction is a technical challenge, because the graft artery usually is short, and other recipient arteries available for anastomosis are limited. In this retrospective cohort study, we analyzed our 10-year experience with 12/582 (2%) LDLT recipients, who underwent splenic artery (SA) transposition for reconstruction of graft HA.

In all cases, recipient HA branches were deemed unsuitable because of severe intimal dissection and poor blood flow. Although, the assessment of the adequacy of SA with pre-transplant CT angiography has become our policy, a decision to perform SA transposition was given after intraoperative ultrasound evaluation. For better size match, SA dissection was continued until the secondary branches in the splenic hilum. In all cases, SA could be fully dissected without major bleeding. In 2 patients, conization other than simple end-to-end anastomosis was required because of size mismatch. An interposition saphenous graft was also required in 2 other cases to lengthen the conduit.

There was one case with perioperative mortality due to sepsis. In a median follow-up of 24.0 (10.2–63.0) months, none of the patients had complications related to SA dissection and ligation. The only late complication was inadvertent injury to the transposed SA during conversion hepaticojejunostomy for biliary stenosis. 1- and 3-year survival was 91.6% and 80.2%.

We consider the SA to be the conduit of choice in LDLT when the recipient's native HA branches are not deemed suitable, because it is easily accessible and offers adequate length and diameter for a successful HA reconstruction. Because of the atypical anatomical localization of the transposed SA, attention should be given to avoid injury during reoperations.