

Abstract# B341

Totally Robotic Donor Hepatectomy: Feasibility And Early Outcomes

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Purpose: Robotic surgery is emerging as a surgical technique to enable resection of the liver using minimally invasive techniques; however, very few living donor liver transplantation centers have reported their experience with totally robotic donor hepatectomy.

Methods: This is a retrospective review of our initial series of robotic donor hepatectomy focusing on operative feasibility and early post-operative outcomes.

Results: From June to September 2018, our living donor liver transplantation program performed our first 4 totally robotic donor hepatectomy operations. Surgeons involved in these cases were both accredited for living donor surgery and robotic surgery. Our program's experience include >300 donor hepatectomy and >100 robotic procedures (90% of which were robotic hepatobiliary operations). There were 3 female and 1 male donor (average age 33). We performed 2 robotic right hepatectomy (RH) and 2 robotic left lateral segmentectomy (LLS) for live donation. The recipients were all relatives; 2 adults (primary biliary cirrhosis and primary sclerosing cholangitis), and 2 children (alpha-1-antitrypsin deficiency and biliary atresia). Average estimated graft weight was 903g (RH) and 220g (LLS). Average GBWR was 1.01 (adult recipients) and 2.04 (pediatric recipients). Average procedure time was 558mins (RH) and 424mins (LLS) while transection time was 228mins (RH) and 150mins (LLS). All grafts were extracted via Pfannenstiel incisions. It took us an average of 11.75 minutes from cross-clamp to flush. Estimated blood loss was 175mls (RH) and 150mls (LLS). Conversion rate was zero. Average highest postoperative bilirubin was 2.4mg/dL (RH) and 1.3mg/dL (LLS). INR did not rise above 1.6 for any donor. One LLS donor had a bile leak which resolved after 4 days; there were no other 90-day post-operative complications. Average length of hospital stay was 5.5 days. There was zero incidence of small for size syndrome, early vascular or biliary complications in the recipients. All donors reported excellent patient satisfaction with the surgery and post-operative course.

Conclusions: In conclusion, totally robotic donor hepatectomy appears feasible for selected patients in centers with large experience in living donor liver transplantation and complex robotic hepatobiliary surgery.

CITATION INFORMATION: Cheah Y. L., Simon C., Lewis W., Jenkins R., Akoad M. Totally Robotic Donor Hepatectomy: Feasibility And Early Outcomes *Am J Transplant.* 2019;19(suppl 3).

DISCLOSURES: Y. Cheah: None. C.J. Simon: None. W.D. Lewis: None. R.L. Jenkins: None. M.E. Akoad: None.

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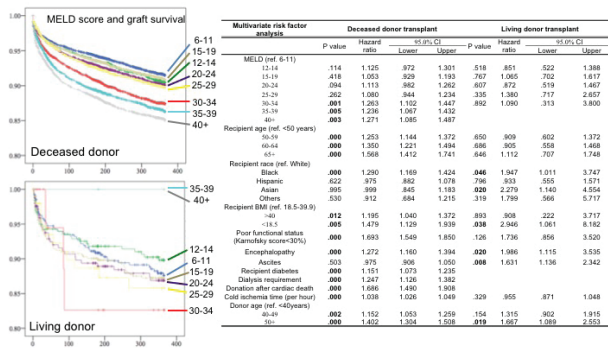
Learning Curve for Living Donor Laparoscopic Left Lateral Sectionectomy.

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Purpose: Living donor liver transplantation (LDLT) is an important method in reducing wait list mortality. Laparoscopic hepatectomy has been investigated in order to decrease donor morbidity, and laparoscopic left lateral sectionectomy (LLS) has shown excellent outcomes at a few centers throughout the world. However, LLS has not been widely adopted due to safety and technical concerns, and thus its learning curve remains undefined. In this study, we aim to evaluate its feasibility and the number of cases required to reach proficiency.

Methods: Prospectively collected data of 37 consecutive LLS from 2009 to 2018 at our institution was analyzed. Operative time (OT) and estimated blood loss (EBL) for each case were plotted chronologically to reflect their trend. The learning curve was determined by applying cumulative sum (CUSUM) methodology for both OT and EBL.

Results: OT and EBL decreased with experience and best trended with exponential curve (Figure 1a/2a). Median OT was 321 (244-427) minutes and median EBL was 150 (50-600) cc. The CUSUM learning curves were best approximated as a second order polynomial for both OT and EBL with $R^2=0.566-0.765$ (Figure 2a/2b). CUSUM analysis reached to proficiency at 14 and 15 cases for EBL and OT, respectively. Mortality was 0%, and morbidity was 8% (Clavien-Dindo grade 3; 2 bile leak and 1 incisional hernia) with median follow-up of 23.5 months.



Conclusions: While increasing the number of living donors may allow expansion of the donor pool, careful consideration should be given to the indication for LDLT in patients with high MELD score, given poor post-transplant outcomes in DDLT patients with MELD score ≥ 30 . Negative impact of moderate/severe ascites was significant in LDLT, but not in DDLT, this can potentially be attributed to smaller graft size in the presence of severe portal hypertension.

CITATION INFORMATION: Kitajima T., Nagai S., Collins K., Rizzari M., Yoshida A., Abouljoud M. Risk Factors for Post-Transplant Outcomes in Living and Deceased Donor Liver Transplantation. An Analysis of UNOS Registry *Am J Transplant.* 2019;19(suppl 3).

DISCLOSURES: T. Kitajima: None. S. Nagai: None. K. Collins: None. M. Rizzari: None. A. Yoshida: None. M. Abouljoud: None.

Abstract# B340

Adult-to-Adult Living-Donor Liver Transplantation: Towards a Prediction of Three-Month Survival Combining Graft-to-Recipient Weight and MELD in a Caucasian Population.

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Purpose: Adult-to-adult living-donor LT (AALDLT) has been proposed to alleviate allograft shortage. However, it is not commonly considered in Western countries due to easier access to deceased donation, when compared to Eastern countries, and sometimes risky graft-to-recipient body weight ratio (GRBWR). We hypothesized that a priori computation of MELD status and GRBWR might predict LT outcome.

Methods: Between 1998 and October 2018 a total of 68 AALDLT were performed at our Centre. Main indications were primary (23/68, 33.8%) and secondary (12/68, 17.6%) liver tumours, cholestatic liver disease (13/68, 19.1%), and alcoholic cirrhosis 10/68 (14.7%). The median MELD was 11 (interquartile range, IQR 7-16). After donor medical and liver volume assessment using MeVis software, 28/68 (41.2%) liver donors underwent full left and 40/68 cases (58.8%) right hepatectomy. The median GRBWR was 0.99% (IQR 0.78-1.21%).

Results: Overall 3-month patient and graft survivals were 85% and 79%. Retransplantation rate was 12%. Causes of mortality were: sepsis (4/10, 40%), sudden cardiac arrest (2/10, 20%), multi-organ failure (3/10, 30%), coeliac trunk dissection with subsequent bleeding (1/10, 10%). Indications for retransplantation were: hepatic artery thrombosis (2/8, 25%), portal vein thrombosis (2/8, 25%), small-for-size syndrome (2/8, 25%), graft failure after caval thrombosis (1/8, 12.5%), massive bleeding from hepatic artery (1/8, 12.5%). Patients were categorized retrospectively with respect to their MELD status (<15 vs. ≥ 15), as well as to their GRBWR ($<0.8\%$ vs. $\geq 0.8\%$). Four sub-groups of recipients were identified accordingly, with their respective 3-month patient death rate: group 1 (MELD <15 ; GRBWR <0.8): 1/13 (7.7%); group 2 (MELD <15 ; GRBWR ≥ 0.8): 2/31 (6.5%); group 3 (MELD ≥ 15 ; GRBWR <0.8): 1/4 (25.0%); group 4 (MELD ≥ 15 ; GRBWR ≥ 0.8): 6/20 (30.0%). The difference in the death rate was statistically significant only for group 2 vs. group 4 ($p=0.045$).

Conclusions: Regardless of graft size, the severity liver disease seemed, in this work, to constitute the prominent predictor of 3-month outcome after AALDLT. In high MELD patients, additional strategies (portal vein modulation including porto-caval shunt) and staged RAPID techniques might be considered.

CITATION INFORMATION: Iesari S., Reding R., Lerut J., Bonaccorsi-Riani E., Coubeau L., Ciccarelli O. Adult-to-Adult Living-Donor Liver Transplantation: Towards a Prediction of Three-Month Survival Combining Graft-to-Recipient Weight and MELD in a Caucasian Population *Am J Transplant.* 2019;19(suppl 3).

DISCLOSURES: S. Iesari: None. R. Reding: None. J. Lerut: None. E. Bonaccorsi-Riani: None. L. Coubeau: None. O. Ciccarelli: None.