



The High Risk Recipient

MINI-ORAL - # 1

Prior Cardiac History of MI, Cardiac Surgery or Percutaneous Revascularization and Echocardiography Measurements Do Not Predict Kidney Allograft Failure or Mortality in the Advanced Age Patient

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Introduction: The number of renal transplants performed in elderly patients has increased across the United States (source: 2006 OPTN/SRTR Annual Report 1996-2005) as well as at our institution. We analyzed our single-center 10-year experience with solitary renal transplantation in patients over the age of 65 and found that all cause graft failure was 31%, compared with 17% in patients age < 65 (p=0004). Cardiac related indicators have been previously validated and are associated with increased graft loss and mortality in recipients of all ages We postulate that cardiac risk factors may have more impact on advanced age recipients and may differentiate recipient selection criteria in the population over 65.

Methods: Over the period from May 1997 to July 2007, we performed 759 solitary renal transplants at our center, 70 of which were included in our study population of patients aged 65 years or older (11%). Patients with simultaneous multi-organ transplants were excluded from analysis [heart+kidney (n=2) and liver+kidney (n=4)]. Three patients were lost to follow-up. The average duration of follow-up was three years. Continuous variables were analyzed by Student's tests and categorical values were evaluated by Fischer's exact test.

Results: Of 67 transplants in 63 patients >65 years of age all cause graft failure and mortality were 31% and 21%, respectively. Prior myocardial infarction, coronary stenting, coronary artery bypass grafting, valvular replacements, or a history of diabetes were not predictive of all cause graft loss (Table) or mortality (data not shown). Cardiac dysfunction as indicated by echocardiographic measurements was also not indicative of all cause graft loss (Table) or mortality (data not shown)

Recipient systolic and diastolic blood pressure, cold ischemic time, type of ureteral anastomosis, and type of donor (standard criteria, ECD or DCD) were also not significant in predicting graft loss.

Infection (24%), malignancy (24%), and cardiovascular events (19%) were the major causes of graft loss and accounted for 14 of 21 of all-cause graft failure. Graft loss as a result of death with a functioning graft was 48%. Death with a functioning graft unrelated to cardiovascular events was 38% of all cause graft loss. Of all the patients who had a cardiovascular-related cause of

	All Cause Renal Allograft Failure		Functional Renal Allograft		P Value
	Transplants (N=21)	Percent	Transplants (N=46)	Percent	
Age	697	(average)	695	(average)	087
Prior MI	3	143%	3	65%	037
Prior CABG	3	143%	6	130%	1
Prior Stent	1	48%	4	87%	1
Prior Valve Replacement	1	48%	2	43%	1
Diabetes	6	286%	13	283%	1

	All Cause Renal Allograft Failure		Current Functioning Renal Allograft		P Value
	Average	STDEV	Average	STDEV	
Echo Indices					
Ejection Fraction (EF)	58%	10%	64%	11%	014
LV end diastolic diameter (mm)	47	4	48	5	053
LV end systolic diameter (mm)	33	5	32	6	066
Wall thickness (mm)	10	2	11	1	049
Mitral annular calcifications	30%	of patients	32%	of patients	1
Pre-operative Albumin (g/dl)	34	09	38	05	0009
Pre-operative Hemoglobin (g/dl)	122	12	122	14	095

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death, three had myocardial infarctions, one had a pulmonary embolism, and one died of cardiomyopathy several months after graft loss from renal vein thrombosis.

Conclusions: Taken together, infection, malignancy and cardiovascular events are the major causes of graft loss in the retrospective reviewed population age > 65. Although advanced age recipients are more likely to experience renal allograft loss compared to younger patients, a pre-transplant history of prior myocardial infarction, cardiac revascularization (surgical or percutaneous) or cardiac valve surgery is not associated with a higher risk of graft loss or mortality. Standard pre-transplant cardiac evaluative tests, such as echocardiography, that quantify left ventricular hypertrophy, left ventricular dilation, and impaired systolic function were not useful in predicting graft loss or mortality. These findings are contradictory to published reports, likely because our study strictly compares advanced age renal transplant recipients instead of recipients of all ages. Alternatively, our protocol for transplantation in elderly patients may have more rigorous inclusion requirements with regard to cardiac dysfunction. Our current results suggest that patients with age > 65 and a cardiac history can be considered good candidates for renal transplantation with low post transplant risk of cardiac related mortality and graft loss.



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MINI-ORAL - # 2

Renal Transplantation in Patients with Systolic Dysfunction

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Patients with end-stage renal disease undergoing preoperative assessment for kidney transplant are routinely screened for cardiac disease. Up to 12% of these patients suffer systolic dysfunction. Post-transplant cardiac dysfunction and congestive heart failure is associated with 15-2-fold higher risk of death We reviewed our single center data for patients undergoing renal transplant with pre-operative evidence of systolic dysfunction, focusing on post-operative and short-term cardiac complications

From 1995 through 8/2007, a total of 988 kidney transplants were completed. Preoperative cardiac data was available for 853 patients (86%). All patients were screened preoperatively with clinical history and physical exam, EKG and chest x-ray Individualized cardiac workup included preoperative echocardiogram, stress test or cardiac catheterization Review of our database revealed that 83 patients (97%) had preoperative evidence of systolic dysfunction.

We divided these patients into three groups based on their severity of systolic dysfunction. Group I included 53 patients with mild systolic dysfunction with EF 40-50%, group II included 21 patients with moderate systolic dysfunction with EF 30-40%, and group III included 9 patients with severe systolic dysfunction with EF < 30% Patients covered a broad age range in all groups. Patients tended to be male and African-American in all groups. Hypertension was a significant risk factor for systolic dysfunction

Postoperatively, there was a significantly higher rate of delayed graft function in group III, despite similar rates of ECD or DCD kidney acceptance. There were no differences in rates of arterial or venous thrombosis among the groups.

Syst Dysfunction	GROUP I EF 40-50%	GROUP II EF 30-40%	GROUP III EF <30%	
N	53	21	9	
DEMOGRAPHICS				
Age	31-73	25-69	24-74	
Female	17 (32%)	6 (29%)	3 (33%)	
Male	36 (68%)	15 (71%)	6 (66%)	
African am	33 (62%)	12 (57%)	8 (89%)	
Caucasian	19 (36%)	8 (38%)	1 (11%)	
Other	1 (2%)	1 (2%)	0 (0%)	
RISK FACTORS				
CAD	26 (49%)	7 (33%)	2 (22%)	
DM	28 (53%)	9 (43%)	3 (33%)	
HTN	52 (98%)	17 (81%)	9 (100%)	p<05
Anemia	41 (77%)	16 (76%)	6 (66%)	
COMPLICATIONS				
Art Thrombosis	0 (0%)	1 (5%)	0 (0%)	
Vein Thrombosis	2 (4%)	1 (5%)	0 (0%)	
DGF	5 (9%)	3 (14%)	4 (44%)	p<05
LKT	25 (47%)	11 (52%)	1 (11%)	
SCD	25 (47%)	8 (38%)	7 (77%)	
DCD	2 (4%)	1 (5%)	0 (0%)	
ECD	1 (2%)	0 (0%)	1 (11%)	
MI	3 (6%)	0 (0%)	0 (0%)	
1-year survival	49/53 (92%)	20/21 (95%)	9/9 (100%))

Peri-operatively, in Group I, 3 of 53 patients suffered a myocardial infarction. There were no associated deaths. Within 1 year of transplant, four patients in group I died. Three patients died from sudden cardiac death, ventricular fibrillation, and myocardial infarction at 1 month, 2 months and 6 months, respectively and one patient died of pneumonia. In Group II, one patient had a myocardial infarction 2 months post-transplant and one patient died 11 months post-transplant from cardiac complications. There were no post-operative or short-term cardiac complications in groups III.

In conclusion, hypertension is a significant risk factor for systolic dysfunction. Despite small numbers, delayed graft function was statistically more prevalent in patients with severe systolic dysfunction (EF <30%). Overall, renal transplantation can be performed in patients with systolic dysfunction without higher risk of postoperative or short-term cardiac events.



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MINI-ORAL # 3

Effectiveness of A Pretransplant Weight Management Protocol for Obese Patients Awaiting Liver Transplantation

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Introduction: Anorexia and wasting accompanies chronic liver disease and traditionally has required pre-transplant nutritional strategies aimed at maintaining or increasing body weight. However, the current epidemic of obesity has also impacted patients with end-stage liver disease, and at present approximately 35% of our wait-listed population has a BMI>30. While our initial attempts in achieving weight loss in obese patients awaiting OLT were disappointing, in March of 2005 we modified our standard approach (lower caloric intake, increased follow-up, and typically a specific weight goal as a contingency for transplant). We reviewed our experience with the specific aim of determining the effectiveness of a pretransplant obesity management protocol.

Methods: All patients listed or seen in follow-up pre-OLT at our center after 3/1/2005 with a BMI ≥ 35 were enrolled in the modified obesity management protocol, and were seen at each follow-up visit to monitor progress. The protocol consisted of a calorie restricted diet (1200-1400 kcal for females, 1400-1600 for males), maintenance of an intake and weight log which was reviewed by center dietitians at each visit, and individualized activity recommendations. Patients received written instructions following each visit .

Results: 78 patients have been enrolled thus far, and 58 have returned for at least one follow-up visit (mean follow-up time 78 months, range 3-29 months). The average BMI at enrollment was 45 (range 33-52). Of the 58 patients with at least one follow-up, 46 (75%) patients lost weight, with a mean weight loss of 106 kg (range 2-40 kg). Fourteen patients have undergone OLT, and 14/14 (100%) have made the target weight by the time of transplant. The mean BMI at transplant was 33 (range 30-36). One patient died POD #6 likely secondary to complications of porto-pulmonary hypertension, while the remaining 13 patients are alive with excellent graft function.

Conclusions: Preliminary results with a rigorous obesity management protocol suggest the protocol is effective at achieving pretransplant weight loss. Further study is needed to determine whether this weight loss will be maintained, whether it will impact metabolic complications post-transplant, and whether it will affect patient survival.

Table 1: characteristics of enrolled patients

Gender M.:F.	32:46
age	52 (range 30-67)
Mean BMI at enrollment	45
% NASH	29% (23/78)
BMI at transplant (N=14)	33



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MINI-ORAL # 4

Pediatric Intestinal Retransplantation: Technique, Management and Outcomes

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Background: Intestinal retransplantation (Re-ITx) has historically been associated with high morbidity and mortality.

Methods/Aim: The records of all children receiving Re-ITx between 1990-09/2007 at our center were reviewed for incidence, indications, techniques and outcomes of Re-ITx.

Results: 172 children received primary intestinal grafts. Fourteen children (81%) were retransplanted with 15 grafts. Causes of graft failure were: acute rejection (ACR, n=4), liver failure (n=2), chronic rejection (n=4), PTLD (n=1), graft dysmotility (n=2), ACR with severe infection (n=1), and arterial graft aneurysm (n=1). Initial transplants were: isolated bowel (IB) in 9, liver-bowel (LB) in 5, and 1 multivisceral (MV). The mean time of initial graft survival was 348 m (range 1-134). Re-ITx was with IB in 2, LB in 4 and MV in 9. Cross match at initial ITx was positive in 2 patients. At Re-ITx, 4 patients had positive cross match (1 B.-cell+, 2 T-cell+, and 1 B. and T cell+). Initial immunosuppression (IS) was with Tac-Pred in 9 and rATG-Tac in 6 cases. Re-ITx was carried out under Tac-Pred in 7 and rATG-Tac in 7 and Campath in 1 case. 10 (714%) patients are alive with functioning grafts at a median current follow-up time of 441m (range 6-1239). 4 patients died from PTLD, severe ACR and fungal sepsis, bleeding from pseudoaneurysm respectively, at a mean time of 56 m post Re-ITx. After Re-ITx, 11 patients experienced rejection (5 mild, 3 moderate and 3 severe) but only one treated under rATG-Tac experienced severe ACR. Current IS is with Tac monotherapy in 6, Tac/Pred in 3 patients and Sirolimus/Pred in 1. All surviving patients weaned off TPN at a median time of 23 days and are off of IV fluids.

Summary: Long term survival and outcome have improved in pediatric Re-ITx. This success rate may be attributed to improvements in IS protocols, technical modifications, proper timing of Re-ITx and improved infectious disease monitoring. Re-ITx frequently required LB or MV transplant after initial isolated intestinal Tx. Careful patient selection and post transplant management are essential to successful long term outcome.



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MINI-ORAL # 5

Is Reoperation Still A Risk Factor in Heart Transplantation?

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Background: The impact of Reoperation in the short and long-term outcomes in heart transplantation has been ill-defined within the modern era. This study was conducted to determine if reoperation (redo) was associated to any difference in outcomes following heart transplantation.

Methods: A retrospective chart review was conducted on all heart transplants performed at the Cleveland Clinic Foundation between 1996 and 2006. For purposes of comparison, 3 groups were created: Primary Surgery (n = 339), Redo Surgery (n = 259), and Ventricular Assist Devices (n = 217).

Results: In comparing groups, demographics were similar; however, Redo- and Primary patients were more likely to be Status 1B while VAD patients were more likely to be Status 1A at the time of heart transplantation Overall 30 day survival was similar between groups. But when comparing, Redo- to VAD patients, the latter had a trend towards lower survival—although, not statistically significant ($p = .05$) during the 30 day follow-up In the post-transplant period, complications commonly affecting Redo and Primary Surgery patients were Rejection (24% vs 29%), but VAD patients often developed Infections (23%). Overall mortalities for Redo, Primary, and VAD patients were 17%, 21%, and 23%, respectively. Common causes of death for Redo and VAD patients included Infections (27% vs 28%), while Graft Failure was the predominant cause of death in Primary surgery patients (26%). Overall, survival when comparing Redo to all other groups was similar ($p = .05$).

Conclusion: Redo heart surgery at the time of heart transplantation does not seem to increase the chances of death in the short and long-term follow-up of heart transplant recipients as previously conceived.



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MINI-ORAL # 6

The Effect of Open-Cardiac Surgical Procedures at Time of Allo-Lung Transplant on Short and Long Term Outcomes

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Objective: To describe the short and long term effects on patients with end-stage lung disease who underwent a lung transplant with a concomitant open-cardiac surgical procedure.

Methods: A retrospective chart review was conducted on all patients who underwent a lung transplant between the years 1990 – 2005. For this study we identified those individuals who had an open-cardiac surgical procedure at the time of transplant at our institution. Variables collected included organ transplanted, date of lung transplant, length of stay post transplant, cardiac surgical procedures performed, indication for lung transplant, date of open-cardiac surgery, and short- and long-term outcomes.

Results: Among 477 patients who underwent a lung transplantation 20 (42%) patients had concomitant open-cardiac surgical procedures. There were 4 (20%) male and 16 (80%) female with an average age of 413 years (range: 199 – 624 years). Eleven (55%) patients had a double lung transplant while 9 (45%) had a single lung transplant. Indications for lung transplantation included chronic pulmonary obstructive disease (n = 5, 25%), primary pulmonary hypertension (n = 5, 25%), Eisen Syndrome (n = 4, 20%), idiopathic pulmonary fibrosis (n = 3, 15%), cystic fibrosis (n = 2, 10%), and chronic thromboembolic pulmonary hypertension (1, 5%) Six (30%) patients had a aortic septal defect (ASD), 5 (25%) patients had coronary artery bypass graft, 3 (15%) patients had tricuspid valve repair, 2 (1%) patients had aortic valve replacement, and 5 (20%) had other open-cardiac surgeries One (5%) patient had multiple open-cardiac surgeries during lung transplantation. The average length of stay in the hospital following lung transplant with concomitant open-cardiac surgery was 28 days (range: 4 - 219 days) Thirty-day, 1 -year and 5- year survival were 80%, 80%, and 55% respectively.

Conclusion: The addition of open-cardiac surgical procedures at the time of lung transplantation does not seem to impact either short- or long- term outcomes in this high risk recipient population.



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MINI-ORAL # 7

Elderly High Risk Kidney Transplant Recipients May Derive Greater Proportional Benefit from Receiving A Standard Criteria Kidney Than Young Recipients: An Analysis of the UNOS Database **Swaminathan Sambandam, Daniel A Katz, and Lawrence Hunsicker.**

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Introduction: Following renal transplantation, elderly renal failure patients have greater overall survival than those who remain on waiting lists requiring dialysis. Many centers preferentially allocate ECD kidneys, with reduced graft half life, to older recipients, those with diabetes, and patients with long waiting times. However, combining extended allografts with high risk recipients may result in higher early mortality rates and increased relative risk of graft failure. Experience also suggests that while younger patient groups may theoretically derive the greatest boost to their life expectancy by receiving an ideal donor kidney, graft loss for reasons other than death may offset this advantage. It has also been our experience that younger patients are more likely to be re-transplant candidates. We have undertaken the current analysis to clarify the logic of allocating older donors to older higher risk recipients by: 1) studying the impact of increasing donor age on recipient survival, 2) measuring the relative benefit on recipient survival of receiving younger versus older donor kidneys stratified by recipient age, and 3) studying the impact of recipient age upon the likelihood of being re-transplanted.

Methods: A retrospective analysis of 129,923 patients in the UNOS Star file as of May 2007 was performed, including all first time deceased donor kidney transplants performed prior to March 2007. The March 2007 transplant limit was applied to ensure full ascertainment of death in the Social Security death master file. Patient data was included for analysis where complete data existed for patient and graft survival and the donor and recipient age were known. Kaplan-Meier and proportional hazards survival (Cox) models were used to analyze data.

Results: Graft loss due to recipient death was determined for each decade of recipient age at the time of transplant. This confirmed that death with a functioning graft increases with increasing recipient age (13% of grafts lost due to death for recipients in their 20s v 60% for recipients in their 60s). Cox analysis was used to measure the relative risk of ascending donor age (grouped in 5 year increments) on recipient survival. Donor age over 50 was associated with a negative impact on patient survival. Beyond age 50 the relative risk of recipient death increased as a function of donor age such that recipients of donor kidneys over age 65 years had a greater than 25 fold risk. Next, we studied the fraction of recipients of failed initial allografts that were re-transplanted as a function of their age at the time of the first transplant. The Cox analysis revealed that the relative likelihood of being re-transplanted decreases with increasing recipient age. When compared with the youngest patients, recipients over age 60 were less than 10 percent as likely to be re-transplanted. Finally, for each decade of recipient age, the difference in median survival of recipients of kidneys from donors less than or greater than or equal to 50 (young v old donors, respectively) was calculated. A comparison of the difference between the medians revealed a significant survival advantage conferred by young donor age to recipients in the 30-39 and 40-49 year old age stratifications.

Conclusion: Despite the fact that older recipients are more likely to lose their grafts due to death than younger recipients, increasing donor age has a greater negative impact on patient survival in older recipients. Furthermore, due to relative differences in re-transplant rates, an older patient's first transplant is also significantly more likely to be their last. Younger donor kidneys confer a survival benefit to middle aged recipients, but did not significantly augment survival in the first three decades of life. These factors should be taken into account when considering modifications to the schema of deceased donor kidney allocation.



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MINI-ORAL # 8

High Risk Kidney Transplant Recipients Benefit from Induction Therapy, Especially in the Context of African American Ethnicity

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Background: Induction therapy has been shown to reduce the incidence of acute rejection and potentially improve graft survival in certain patient populations. However, the type of agent to use (IL-2 receptor antibodies (IL-2RA) or anti-lymphocyte antibodies (ALA)) and when to use induction therapy based on patient risk factors and/or ethnicity is still heavily debated. The aim of this study was to compare acute rejection rates and graft outcomes based on three induction regimens (no induction, IL-2RA, or ALA) across low and high risk recipients and in African American and non-African American recipients.

Methods: This was a retrospective analysis of all adult kidney recipients transplanted between June of 1999 and June of 2007 at MUSC. Pediatrics and patients receiving non-kidney transplants were excluded. Patients were separated into 4 distinct groups (low risk non-African Americans [group 1], high risk non-African Americans [group 2], low risk African Americans [group 3], and high risk African Americans [group 4]). High risk recipients were defined as those who were re-transplants, had a PRA of >20% at the time of transplant, or developed delayed graft function. Recipient and donor demographics and transplant characteristics were collected along with acute rejection rates, graft outcomes, and patient survival. Univariate analysis was performed with Fisher's Exact Test and Kaplan-Meier Survival Curves. Multivariate analysis was performed with Cox Proportional Hazard Regression.

Results: A total of 1066 patients were included in this analysis, 332 in group 1, 137 in group 2, 372 in group 3, and 225 in group 4. Table 1 displays the acute rejection rates and graft survival rates for each group. The use of IL-2RA and ALA induction therapy significantly reduced rejection rates in high risk patients across all ethnicities. Induction therapy appears to improve graft survival rates in both high and low risk African American patients. Multivariate analysis for the outcomes of acute rejection and graft survival are displayed in tables 2 and 3, respectively. Induction therapy independently reduced the risk of having acute rejection, although this did not remain significant when analyzing graft survival rates.

Conclusion: The use of induction therapy significantly reduces acute rejection rates in high risk recipients (both IL-2RA and ALA), and may improve graft survival in African American recipients

Table 1 – Acute rejection and graft survival rates based on ethnicity, recipient risk, and induction regimen.

Group	Acute Rejection			p-Value	Graft Survival			p-Value
	No Induction n=252	IL-2RA n=569	ALA n=245		No Induction n=252	IL-2RA n=569	ALA n=245	
non-African American								
1: Low Risk (n=332)	23%	20%	13%	0.52	88%	90%	93%	0.66
2: High Risk (n=137)	40%	28%	14%	0.04	65%	85%	81%	0.15
African American								
3: Low Risk (n=372)	31%	24%	22%	0.30	75%	87%	82%	0.03
4: High Risk (n=225)	62%	43%	30%	<0.01	47%	70%	82%	<0.01

Table 2 – Multivariate analysis for acute rejection.

Factor	Hazard Ratio	95% CI	P-value
African American	1.33	1.03 – 1.73	0.032
Age	0.98	0.98 – 0.99	0.008
High risk recipient	1.91	1.49 – 2.45	<0.001
Female	0.839	0.66 – 1.07	0.155
Induction			
IL-2RA	0.722	0.55 – 0.95	0.019
ALA	0.451	0.31 – 0.65	<0.001
HLA mismatch	1.12	1.03 – 1.21	0.010
CMV infection	1.56	0.99 – 2.45	0.051
CMV D.+/R.- serostatus	1.23	0.94 – 1.62	0.132

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Table 3 – Multivariate analysis for graft survival.

Factor	Hazard Ratio	95% CI	P-value
African American	1.27	0.91 – 1.77	0.162
Living donor	0.59	0.35 – 0.99	0.045
Warm ischemic time	1.02	1.01 – 1.03	<0.001
High risk	1.87	1.37 – 2.53	<0.001
Female	1.38	1.03 – 1.84	0.03
Induction	0.88	0.63 – 1.24	0.48
IL-2RA	0.69	0.45 – 1.06	0.09
ALA			
HLA mismatch	1.14	1.04 – 1.26	0.008
Perfusion	0.67	0.41 – 1.10	0.11



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MINI-ORAL # 9

Does Simultaneous Lung - Liver Transplantation Provide An Immunologic Advantage Compared to Isolated Lung Transplantation?

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Objectives: Patients with end-stage lung disease and advanced liver cirrhosis are considered poor candidates for isolated lung transplantation due to heightened post-operative morbidity and mortality. Same-donor liver transplantation may ameliorate surgical risk by conferring an immunologic advantage to simultaneously performed lung transplantation. This study describes our experience with simultaneous lung-liver transplantation and compares immunologic outcomes in this group to similar patients receiving lung transplantation alone.

Methods: Retrospective review of our transplant database identified five patients (4 adult & 1 pediatric) who received simultaneous lung-liver or heart-lung-liver transplantation. All patients were declined isolated lung transplantation due to excessive surgical risk. The 4 adult patients were compared to matched control group of 16 patients who underwent isolated lung transplantation. The pediatric patient was excluded due to lack of an appropriate control group.

Results: The average age for the entire group was 25 years (3 - 37 years, range). Indication for transplantation was cystic fibrosis in 3 patients, primary pulmonary hypertension in 1 patient and Eisenmenger's syndrome in the single pediatric patient. Patients spent an average of 107 and 358 days on the liver and lung transplant waiting lists, respectively. There were no operative mortalities. Survival at one year was 100% and at a mean follow up period of 29 years was 80%. One patient required repeat double lung transplantation for bronchiolitis obliterans 848 days following primary transplantation. Rejection (grade ≥ 15) within the first year occurred in 0/4 patients (0%) after simultaneous lung-liver transplantation versus 10/16 matched control patients (62.5%, $p=0.043$) who underwent lung transplantation alone. The average number of biopsies in both groups was not different

Conclusions: Simultaneous lung-liver transplantation may be performed safely with good mid-term outcome. Same-donor liver transplantation provides an immunologic advantage to simultaneously performed lung transplantation. Further studies are warranted to better understand how this potential benefit may improve outcomes for this high risk group of patients.



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MINI-ORAL # 10

Pre-Transplant Viral Load Predicts Mortality after Retransplantation for Recurrent Hepatitis C

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Background: Hepatitis C related cirrhosis is the most common indication for liver transplantation in the United States. HCV recurrence following transplantation is universal. Severe recurrent hepatitis occurs in 6-23% of patients, and 10-25% of patients require retransplantation within 5 years. Recent studies have reported worse survival rates for retransplantation, and thus it is considered to be a controversial practice. At the time of initial transplant, high viral loads have been associated with decreased graft and patient survival. We studied the outcomes of retransplantation for Hepatitis C at our institution to evaluate whether pre-operative viral loads, MELD scores and renal function were associated with worse outcomes.

Methods: Patients transplanted for hepatitis C at our institution between 1996 and August 2007 were retrospectively analyzed. Ten of these subjects underwent retransplantation for recurrent cirrhosis secondary to hepatitis C. Mortality was evaluated with respect to the time to transplantation, MELD score, quantitative HCV PCR, serum creatinine, recipient age, and history of antiviral therapy.

Results: 193 patients were transplanted for Hepatitis C during this time period; 15 were retransplanted, 10 of whom were retransplanted for recurrent end-stage liver disease secondary to Hepatitis C. The average time to 2nd transplant was 32 months (4-96 months). The 1-year survival rate after 2nd transplant was 70%; the three year survival was 60%. No statistically significant difference was seen in the MELD scores, serum creatinine, presence of diabetes, time to transplant, and patient age between survivors and non-survivors. All patients had viral loads drawn prior to retransplantation. One hundred percent of patients with viral loads less than 500,000 IU/ml (n=5) are still alive with at least 45 months follow up; the 36 month survival of patients with a viral load greater than 500,000 IU/ml (n=5) is only 20% (p<001, Chi square). The mortalities included 2 perioperative deaths and 2 deaths secondary to HCV recurrence.

Conclusions: Hepatitis C viral load should be used to determine whether a patient is a candidate for retransplantation because in our series, patients with viral loads greater than 500,000 IU/ml had a 3- year mortality of 80%. Viral load is a better predictor of mortality than MELD score, recipient age, renal function, and diabetes.