Thursday June 13, 2013

Vanguard Grand Rounds (Case Presentations):
Today’s Vanguard Grand Rounds session was again well-attended. The three cases presented involved topics that were relevant to a broad audience: hepatology, surgery, pediatrics, anesthesiology and critical care.

Case Presentation 1: “When is a Patient ‘Too Sick’ to Transplant?”
Ram Subramanian and David Kramer presented a patient with acute decompensation of chronic HCV liver disease resulting in encephalopathy, septic shock, ARDS, and AKI. Potential predictors for successful transplantation of a patient requiring maximal support were reviewed. In addition, “local” considerations including donor quality and institution/program depth are significant. Unfortunately, there are sparse multi-center data on parameters affecting the decision to transplant critically ill patients with high MELD scores.

Case Presentation 2: Two-stage Liver Transplantation in Extreme Clinical Situations
Cynthia Wang and Luc Delriviere reported a case of intra-operative primary non-function that necessitated an emergent transplant hepatectomy. Intra-operative and post-operative management issues with respect to correction of coagulopathy and acidosis were reviewed as well as current data on the length of time that a patient
can be maintained prior to transplant. Important technical considerations in performing this rare procedure were reviewed as well as the potential of new therapies including extracorporeal liver support were also discussed.

**Case Presentation 3: The Role of Liver Transplantation for HCV-HIV Co-infected Patients**

Geraldine Diaz and Peter Stock discussed a case of an HCV-HIV infected patient who presented for liver transplantation. The issues surrounding candidate evaluation, donor selection, and postoperative management for this complex group of patients were addressed. Results of the multi-center study ‘Solid Organ Transplantation in HIV’ were highlighted that demonstrate careful recipient and donor selection may improve patient and graft survival. Acute rejection and hepatitis C recurrence remain important issues in the postoperative period.

**Friday June 14, 2013**

**Vanguard Debates**

Amelia Hessheimer of the University of Barcelona and Michael Crawford of Sydney South West Area Health Service debated on the merits of uncontrolled DCD allograft utilization. Dr Hessheimer reported on the success of the Barcelona model of early donor identification, rapid recovery, and normothermic machine perfusion to deliver outcomes that rival conventional DCD outcomes utilizing Maastricht type III donors. Dr Crawford acknowledged the Barcelona groups’ outstanding results but noted that Spain’s acceptance of presumed consent, societal attitudes toward early interventions to facilitate donation, as well as a history of institutional acceptance and commitment toward uncontrolled DCD facilitate the group’s efforts and may be significant obstacles toward
widespread application.

Robert Venick of the University of California Los Angeles and Abraham Shaked of the University of Pennsylvania debated immunosuppression versus withdrawal. Dr Venick presented a pediatric case as a mechanism to review the long-term morbidity of immunosuppression that may be underappreciated in the literature including renal insufficiency, diabetes, and malignancies. Previous studies have suggested the incidence of tolerance among pediatric recipients may approach 20%; however, controlled trials aimed at complete immunosuppression withdrawal have resulted in a significant incidence of rejection and isolated cases of allograft loss. Dr Shaked termed tolerance a “clinical curiosity” that is currently beyond the clinical realm; however, the wide variety of immunosuppression currently available permits tailored immunosuppression with a long-term goal of immunosuppression minimization rather than withdraw. Both authors agreed the further development of biomarkers and a tolerance assay would be significant clinical achievements.

Lastly, Francesco D’Amico of Padova University and Jonathan Fawcett of Queensland Liver Transplant Service debated the role of liver transplantation for hepatocellular carcinomas under 2cm in diameter. This discussion focused upon defining the debate in terms of intention-to-treat or disease-free survival. If the goal is to maximize intention-to-treat, then allocation practice will dictate the role of liver transplantation. However, the long standing observation that end stage liver disease accounts for approximately one half of all morbidity among patients with hepatocellular carcinoma strengthens the role of liver transplantation when the goal is to optimize disease-free survival. Additional considerations include the etiology of liver disease (ongoing or absent) and the implementation
of liver transplantation as pre-emptive or salvage therapy. Aggressive implementation of resection is most appropriate in patients who do not have continuing liver injury, are marginal candidates for liver transplantation, or are in areas of organ scarcity.

**The High Risk Recipient**
Pierre-Francois Laterre of the St. Luc University Hospital delivered an outstanding presentation titled “The Recipient with Infection.” The presentation was based upon comparing two infected patients, each with end-stage liver disease and a high MELD, who were critically ill awaiting liver transplantation. Through the case presentations, Dr Laterre reviewed considerations critical to the decision to proceed or withhold transplantation including, respiratory status, vasopressor utilization, pathogen identification, multi-organ dysfunction, and mental status. The importance of maintaining a nutritional regimen during periods of sepsis was emphasized, particularly enteral feedings. He also introduced the concept of transplantation within the context of controlled sepsis where hemodynamics and clinical condition may support transplantation even if a suitable antibiotic clearance period has not been achieved.

Christopher Wray of the University of California Los Angeles presented “The Cardiac Compromised Recipient.” The lecture began with a review of the rising incidence of cardiac disease among cirrhotics. Multiple factors including increasing candidate age, diabetes, obesity, and non-alcoholic steatohepatitis contribute to an observed incidence of coronary artery disease that exceeds the US population. Dr Wray reviewed the current diagnostic testing regimens for candidate evaluation including dobutamine stress echocardiography and coronary catheterization and noted a multi-center trial he authored that demonstrated no survival difference
between transplant candidates with treated coronary artery disease and nonexistent coronary artery disease. He concluded by describing the evolving treatment utilizing coronary artery stents, anti-platelet therapy, and their implications for surgical candidacy.

James Ferguson of Queen Elizabeth Hospital reviewed the topic of “Pulmonary Disease, Portopulmonary Hypertension, and Hepatopulmonary Syndrome”. With improvement in perioperative management, there has been an overall benefit among patients with hepatopulmonary syndrome undergoing liver transplantation. Hypoxemia is typically reversible, but patients may require oxygen supplementation for up to 2 years. On the contrary, liver transplantation in patients with portopulmonary hypertension (PPHTN) remains controversial as improvement following transplant is unclear. Medical therapy consisting of prostacyclin, endothelin antagonists, and phosphodiesterase inhibitors has improved survival in patients with PPHTN. It is critical to assess right heart function in these patients. Severe PPHTN remains a contraindication to liver transplantation. However, if the patient demonstrates improvement with medical therapy, liver transplantation may be considered.

Andrew Watts of Royal Prince Alfred Hospital presented the effect of obesity and malnutrition on waitlist performance and outcomes following liver transplantation. Overall outcomes for each group are inferior for different reasons. The principle challenges with transplanting the obese relate to co-morbidities and technical difficulties associated with surgery, diagnostic radiology, and therapeutic interventions. Early data on the role of obesity surgery prior to transplantation are promising but require further study. The fundamental difficulty in patients with sarcopenia is the underlying etiology as well as its effect on immunity and physiologic
reserve. Diagnostic studies for sarcopenia have improved, but what needs further evaluation is synthesis of sarcopenia information with prognostic information from the MELD to give a clear understanding of their transplant benefit.

**Concurrent Oral Abstract Session: Anesthesia / Critical Care Medicine:**

This was a highly interactive session on intraoperative hemodynamic monitoring, glycemic management, and postoperative acute lung injury.

Dr. Wayne Soong from Northwestern University conducted a study to determine the utilization of TEE during liver transplantation by US transplant programs. Survey data of US liver transplant programs indicated a significant increase in the routine application of intra-operative TEE. Other programs have reserved TEE for special circumstances but less than 5% of responding centers indicated no application of TEE in liver transplantation. The most frequent reasons reported for not utilizing TEE was no apparent indication and lack of training.

A study that investigated the rates and severity of complications related to invasive hemodynamic monitoring during liver transplantation was presented by Dr. Tetsuro Sakai from the University of Pittsburgh. There was an overall low incidence of complication rate (<2%), with moderate severity, that resulted from the insertion of invasive hemodynamic monitors. The most frequent complication was related to the insertion of femoral catheters for veno-venous bypass and arterial pressure monitoring. Interestingly, the authors have changed their practice by using the brachial artery as an alternative to femoral arterial catheters, but results are not yet available.
Dr. Victor Xia from the University of California, Los Angeles conducted a study that investigated the rates, risk factors, and outcomes from acute lung injury (ALI) after orthotopic liver transplantation. The incidence of postoperative ALI was 4.3%. Risk factors for the development of ALI include preoperative encephalopathy, preoperative mechanical ventilation, total bilirubin, and intraoperative RBC/FFP transfusion. ALI was associated with prolonged postoperative mechanical ventilation, prolonged hospital stay, and graft failure.

Dr. Jana Hudcova of Lahey Clinic presented a study on intraoperative blood glucose control and outcomes among diabetic and non-diabetic patients receiving deceased donor as well as living donor liver transplantation. The authors reported intraoperative hyperglycemia requiring insulin therapy occurred in 73% of recipients. They also demonstrated increased peak blood glucose and greater blood glucose variations were associated with higher incidence of postoperative infections. Peak glucose levels and glucose variations did not significantly affect the rate of ICU admissions and hospital mortality.

Kaliamoorthy et al of Global Hospitals and Health City demonstrated improved outcomes following the institution of a structured anesthesia team in the delivery of care. The authors compared outcomes for both deceased donor and living donor recipients and found that following the institution of a uniform clinical algorithm improved outcomes despite a more complex and critically ill patient population. Their practice also significantly decreased resource utilization.

**Featured Symposium #3: Acute Liver Failure**

This session provided a comprehensive review of acute liver failure. The peri-operative management of acute liver
failure and the importance of identifying the etiologic agent were reviewed. Treatment strategies and prognosis based upon etiology were compared. Disease specific management of chronic liver diseases presenting as ALF including autoimmune hepatitis, Budd-Chiari, and Wilson’s disease were also discussed. Additional discussions focused upon the management of cerebral edema, sepsis, and acute kidney injury that are common in ALF. Dr. Soin presented data on the controversial role of living donation for ALF and proposed living donation may be an acceptable alternative to deceased donor liver transplantation in regions where deceased donors are scarce.

Concurrent Oral Abstract Session: Cardiac Evaluation and Outcomes: Abstracts and Interactive Cases

This session addressed coronary artery disease screening and management in patients awaiting liver transplantation. Ongoing debate regarding the ideal screening test (myocardial perfusion scan versus dobutamine stress echocardiography) and when to proceed with coronary angiography were discussed. Cirrhotic cardiomyopathy identification and management remain clinical challenges.

A case of postoperative rapid cardiac decompensation in a patient with atrial fibrillation who underwent an uneventful liver transplantation was presented. This case raised the possibility of undiagnosed cirrhotic cardiomyopathy.

A patient with pulmonary hypertension who presented in the operating room for liver transplantation and was found to have an undiagnosed atrial septal defect was discussed. The pulmonary artery pressures were similar to systemic pressures that prompted placement of a TEE.
The TEE demonstrated that the pulmonary artery catheter entered the left atrium via the ASD. The transplant procedure was aborted. The patient underwent a combined ASD closure and liver transplantation at a later date.