



Short Communication

Perioperative management of liver transplantation in a post CABG patient with very low ejection fraction – A challenging case

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Liver transplantation stresses the cardiovascular system, and limited preoperative cardiac reserve may be associated with poor outcomes postoperatively. History of cardiac disease is an important predictor of perioperative morbidity and mortality in patients undergoing liver transplantation.¹ Coronary artery disease (CAD) has been known to adversely affect the outcome of patients undergoing liver transplantation. High resting cardiac output (CO) and low systemic vascular resistance (SVR) in end-stage liver disease (ESLD) and perioperative haemodynamic alterations during surgery contribute adversely to the outcome.² High morbidity and mortality in CAD patients undergoing orthotopic liver transplantation (OLT) are likely to be multifactorial. Cardiac function of the transplant recipient must be adequate to handle marked perioperative haemodynamic alterations. Additionally, in the immediate postoperative period, SVR is elevated and CO is decreased as normal liver function is reestablished.

We present a challenging anesthetic management of a 62 yr male with h/o CABG for triple vessel disease (15months ago) with poor LV function and Pulmonary artery hypertension for living related liver transplantation. The patient was a case of Hepatitis C related ESLD (Meld 10, Child B), decompensated with massive ascitis, UGI bleed and progressive jaundice. The

patient was hypertensive and diabetic on insulin therapy. The preoperative ECHO showed LVEF25%, PASP34mmHg and SVR1381dynes/s/cm⁵. DSE was negative for reversible ischemia. A thorough preoperative anesthesia workup was done, and cardiology clearance was given under high risk. Cardiac medications (Torsemide and Nitroglycerin) were continued.³ Flotrac based cardiac output monitoring with radial artery cannulation, prior to fentanyl based induction was done and baseline parameters were recorded. As per literature, femoral artery catheter can also be done, and is useful in cases with major fluid shifts and high inotropic support, but we used radial artery catheter as per our institutional protocols. Swan-Ganz PA catheter was inserted and hemodynamic parameters were calculated using thermodilution technique at regular intervals. Intraoperative TEE was done during anhepatic phase and it showed myocardial functions consistent with preoperative ECHO. Noradrenaline and vasopressin infusion was started to maintain SVR, SVV and MAP. Insulin infusion was used to maintain blood sugar level. Hourly monitoring of ABG along with lactate, CBC, coagulation profile and electrolytes was done. Surgical technique used side clamping of IVC and no venovenous bypass. Anhepatic phase was kept short, restricted and goal directed fluid strategy along with albumin infusion was used, and Hb was maintained around 8-9gm/dl with PRBC transfusion. INR was around 2.0 which was accepted as the

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thromboelastogram was normal, and other blood products not used. The reperfusion phase and rest of the surgery was uneventful, and the patient was shifted to transplant ICU for postoperative mechanical ventilation and monitoring.

On postoperative day (POD) 1, Swan-Ganz and Flotrac monitoring was continued and ECHO showed EF 32%, CVP 11, SVR 748dynes/s/cm⁵ & CO 7.6 litre/min. The trachea was extubated on POD 1 when the patient was fully awake. Postoperative noradrenaline and vasopressin were continued at low doses in the ICU till 7th postoperative day to maintain SVR and coronary perfusion till patient was mobilised and adequate immunosuppression achieved. ECHO was done on a daily basis during the ICU stay, and the ejection fraction increased to 40% before discharge.⁴ The patient was shifted out of ICU on POD9, and was discharged to home on POD15.

Liver transplantation causes significant and heavy stress on the cardiovascular system of patients, who may experience massive bleeding and transfusion, inferior vena cava clamping, severe hypotension, and postreperfusion syndrome. Therefore, anesthesiologists should understand the pathophysiology of ongoing and postoperative forthcoming cardiovascular derangement in LT candidates and must identify risky patients preoperatively for successful LT. Meticulously monitored intraoperative and postoperative period with multiple techniques of hemodynamics and cardiac assessment, side clamp technique with short anhepatic phase, goal directed

fluid strategy, along with close communication with the surgical team are the essential aspects for successful management of such a case.

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