

[NM-319] Anesthetic Management and Postoperative Care for Hepatic Adenoma Resection and Rex Shunt Creation in a Patient with Severe Primary Pulmonary Hypertension

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Case report:

23 year old woman with primary pulmonary hypertension and portal hypertension diagnosed 2006, on continuous treprostinil infusion, sildenafil, enalapril, furosemide, and spironolactone s/p atrial septostomy, found to have two liver masses with small hemorrhage in March 2013 was brought to OR for resection of mass and rex shunt creation in Sept 2013. She was admitted to Cardiac ICU preoperatively. Cardiologists placed a pulmonary artery catheter which showed PA systolic pressure of 90-100 mmHg, enlarged the therapeutic ASD, and started milrinone infusion.

Intraoperatively general anesthesia was induced and maintained with propofol and ketamine infusions. Treprostinil and milrinone were continued throughout the case, and cardiac output calculated from thermodilution measurements ranged from 7 to 12 liters per minute. The hepatic adenomas were excised and rex shunt was successful. EBL was 3300 mL, and she received PRBC 6 units. Postoperatively she returned to CICU and remained intubated overnight. She was extubated to nasal cannula on POD1. She had an uneventful recovery until POD 5 when she became hypotensive, developed mental status changes and renal failure. Echocardiogram revealed worsening RV systolic function and LV outflow tract obstruction due to septal bowing. Vasoactive agents were added - epinephrine, vasopressin, calcium chloride, and norepinephrine; stress dose hydrocortisone and broad spectrum abx were given empirically; inhaled nitric oxide by facemask was started. She was 10kg above her dry mass, the ICU team started aggressive diuresis with furosemide, spironolactone. Over the following week her body mass returned to normal, cardiac function returned to baseline; iNO was discontinued by POD10. She also suffered exacerbation of thrombocytopenia, dropping from 34 000 preoperatively to 6000 by POD7, requiring transfusion due to small spontaneous subdural hematoma. IVIG and hematopoietin were discussed as potential treatments but proved unnecessary. She was transferred to the floor on POD43 in stable condition.

Discussion:

Left heart failure is the most common cause of right heart failure, but here we examine a case of right heart failure causing left heart failure. The chambers share the interventricular septum and pericardial sac, hence the concept of ventricular interdependence. The septal bowing of RV into LV led to LVOT obstruction and inadequate organ perfusion (shock state).

Thrombocytopenia as a result of platelet pooling is common in hypersplenic patients with portal hypertension, likely due to different transit times in various tissue beds of the spleen. This sequestration can be mitigated with beta agonists such as epinephrine.

Inhaled nitric oxide is best delivered by tracheal tube but can also be delivered nasally or by face mask. There is potential for nebulized prostacyclin to play a role in ameliorating postoperative pulmonary hypertension, which may convey significant cost savings compared to iNO. Depth of anesthesia monitors have grown in use over the last two decades. In a patient with poor cardiopulmonary reserve, minimizing the amount of anesthetic delivered may offer benefit. However, ketamine is associated with higher Bis values even at desired amnestic and anesthetic levels.
