

Perioperative Challenges During Emergency Lscs & Management Of Post-Partum Pulmonary Edema In A Case Of Critical Mitral Stenosis With Severe Pulmonary Artery Hypertension

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ABSTRACT

Parturient with severe mitral stenosis (MS) poorly tolerate pregnancy, while pregnancy is contraindicated in severe Pulmonary artery hypertension (PAH) as it poses high morbidity and mortality due to impending decompensated heart failure, pulmonary edema, atrial fibrillation, thromboembolic events, etc. We successfully managed a case of Rheumatic Heart Disease with severe MS (MVA:0.56 CM²) severe PAH (100mmhg) & severe TR in a 24- year-old multiparous female in active labor for emergency LSCS under General anesthesia despite inadequate NBM of only 2 hours. Aspiration prophylaxis, Modified Rapid Sequence Induction & Intubation, nasogastric tube aspiration, etomidate were key components of induction. Hemodynamic perturbations were promptly managed with fentanyl, loxicaid, esmolol. Despite precaution, after adequate reversal and uneventful extubation, she developed pulmonary edema probably due to autoregulation and went for decompensation. Timely management of the critical scenario with 100% O₂, furosemide, re-intubation and Noradrenaline improved the hemodynamic status, positive pressure ventilation given for a day and extubated uneventfully in surgical ICU and discharged to ward in a couple of days.

Keywords: mitral stenosis, Pulmonary artery hypertension. emergency LSCS

INTRODUCTION

Parturient with valvular heart disease poses challenge to anesthesiologist owing to adverse maternal and fetal outcomes. Patients with severe MS poorly tolerate physiological changes of pregnancy. Moreover, severe PAH poses high morbidity and mortality due to impending

decompensated heart failure, pulmonary edema, atrial fibrillation and thromboembolic events. Determining appropriate anesthetic and analgesic modality necessitates a deep understanding of peculiar maternal physiology, pathophysiology of cardiac disease and pharmacotherapy employed. In the multidisciplinary approach for good perinatal outcome, Anesthesiologist plays a pivot role in providing efficient management, especially in an emergency setting,

CASE HISTORY

24-year-old female G3P1L1A1 at 37 weeks of gestation presented to OR in active labor, with a dilatation of 4cm with breathlessness posted for emergency LSCS. On examination, HR 125/minute, BP: 118/96 mmHg; RR: 20/min, CVS: S1 soft; S2 p2 loud, mid-diastolic murmur at mitral area RS: NVBS NAS; bilateral pedal edema. She had no C/O chest pain/ Orthopnea/ paroxysmal nocturnal dyspnea.

She is married since 5 years, had a previous FTNVD 3 years back uneventfully, and a spontaneous abortion 1 year back. The patient was diagnosed with Rheumatic heart disease (RHD) with MS with severe PAH since a year, and was on treatment with penicillin every 21 days along with digoxin and diuretics. ANC registration was done in our hospital only at 35.4 weeks of gestation with complaints of bilateral pedal edema associated with NYHA3 breathlessness since a month. ECG showed Normal sinus rhythm, right axis deviation, p pulmonale, T wave inversion in V1-V3. A cardiology reference was done with 2D ECHO showing rheumatic affection of the aortic and mitral valve with & severe MS (mitral valve area 0.56 cm²) eccentric jet moderate to severe Mitral regurgitation, dilated left & right Atrium, TAPSE=19. severe Tricuspid Regurgitation, severe PAH (RSVP= 100 mmHg, mild Aortic regurgitation, LVEF:60%. Advised IE prophylaxis, T.furosemide 40-20-0: T. Metoprolol 25 mg OD: T. eplerenone 25 mg1-1-0. As the patient was not in atrial fibrillation/acute decompensated heart failure. There was no role for digoxin, hence discontinued as advised.

The patient was planned for elective LSCS, but as she went into Labor prior to it, she was posted for emergency LSCS. NBM status was just 2 hours. Aspiration prophylaxis was given with Inj. Pantoprazole 40 mg IV, Inj. Metoclopramide 10 mg IV, Ryle tube insertion, and mechanical aspiration of gastric contents was done. Right radial artery cannulation & 18 G IV cannulation were done. Pressor response was prevented with Inj. Lignocaine 2% 1.5 mg/kg (preservative free), Inj.Esmolol @ 0.5 mg/kg and Inj.Fentanyl @ 1mcg/kg was given with fetal HR monitoring. ⁽¹⁾. Induction with Inj. Etomidate @ 0.3 mg/kg and INJ. succinylcholine @ 1.5 mg/kg. modified RSII Intubation was done with 7.5 ID mm ETT. Inj. Vecuronium 4 mg IV was given. Anesthesia was maintained with ISOFLURANE 0.6%, on volume control ventilation with 50% of air and oxygen ⁽²⁾. Peak airway pressures were maintained below 20 cmH₂O with a PEEP of 5 cmH₂O. Intraoperative hypotension was managed with Inj. Phenylephrine 50 mcg bolus. The time of delivery of the baby from the time of entry into OR was 14 minutes. After the baby's delivery, IV carbitocin was given. Inj. Fentanyl @ 1 mcg/kg was repeated. Intra-operative period a Total of 400 ml crystalloid was given. Initial urine output was 50 ml. Intermittent boluses of Inj. Furosemide IV was given ⁽³⁾. After adequate spontaneous respiration, neuromuscular blockade reversal was done with Inj. Neostigmine 0.05 mg /kg and Inj. glycopyrrolate 0.008 mg/kg. Pressor response during extubation was managed with Inj. Esmolol @ 0.5 mg /kg.

After extubation, there was tachycardia (HR: 140/ Min), desaturated to 86 % spo₂, associated with crepitations. In view of suspected pulmonary edema, 100% O₂, Inj. Lasix 40mg iv, Inj. succinylcholine of 50 mg IV and Inj. Propofol was given, given and re-intubation was done with ETT 7.0 mm ID. Following intubation, saturation improved to 100% but persisting

hypotension required initiation of inj. Noradrenaline at 0.05 mcg/kg/min and the patient was shifted and observed in SICU, electively ventilated for a day, and after tapering Noradrenaline and cardiology review, extubation was done the next day after achieving stable hemodynamic and pulmonary status.

DISCUSSION

Moderate to severe MS can be managed with good medical therapy and can be delivered vaginally with adequate epidural analgesia, whereas severe PAH is regarded a contra indication to pregnancy in itself. ⁽⁴⁾ with a high mortality rate of (30-56 %) In scenarios where medical termination of pregnancy has failed, elective cesarean section is advised as adequate planning and proper timing of delivery plays a crucial role in avoiding complications. Unfortunately, our parturient encountered severe labor pain with fast progression, which may be attributed to multiparity warranting immediate termination.

There are various studies stating use of fentanyl and esmolol ^(1,2). In our case scenario where obtunding hemodynamic perturbations is of paramount importance, attenuating pressor response to avoid inadvertent tachycardia is inevitable indeed. So, we had alerted the pediatric team for preparedness with naloxone and neonatal resuscitation for perinatal respiratory depression. ⁽⁴⁾

We adopted modified RSII with Sellick's maneuver ⁽⁶⁾ Considering aspiration pneumonitis (Mendelson syndrome), following intubation Nasogastric tube insertion and mechanical aspiration of gastric contents was done to prevent micro aspiration or aspiration during extubation. Although there are studies to prove efficacy of cricoid pressure even in the presence of NG tube ⁽⁷⁾, we avoided it accounting to quickest termination for anticipated perinatal depression in fetus. We encountered patient discomfort during initial phases of Sellick's maneuver in lighter plane of etomidate anesthesia which was preferred iv induction agent of choice. Although there are various studies to state pressure required in newton, inter user variability poses difficulty in management. Considering such scenarios, and other studies questioning the use of cricoid pressure, ⁽⁷⁾ further studies may be carried out on the role of cricoid pressure in patients undergoing GA.

Despite adequate measures we encountered pulmonary edema post extubation probably due to autoregulation phenomenon seen post-delivery. This ⁽⁸⁾ case reports attributes postpartum decompensated heart failure due to sudden increase in preload due to autotransfusion. As effects of autotransfusion may be extended in postpartum period we chose to electively intubate and give positive pressure ventilation until stabilization of symptoms.

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