

Isolated pulmonary stenosis: Anaesthetic challenges in a parturient coming for LSCS

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ABSTRACT

Cardiac diseases associated with pregnancy pose as a major risk factor for both mother and foetus and make anaesthetic management challenging in such cases, leading to severe mortality and morbidity. We present a rare case of a severe isolated pulmonary stenosis, diagnosed in routine antepartum checkup coming for an elective caesarean section.

Key words: Caesarean Section, Pulmonary Stenosis, Pregnancy, TAP block

INTRODUCTION

Haemodynamic changes in pregnancy are a major stress factor in peripartum period; more so when associated with a concomitant cardiac pathology. Right ventricular outflow tract obstruction can be valvular, subvalvular or supra-valvular. The incidence of pulmonary stenosis is around 10-12% with valvular pathology being most common around, 90%¹. It can be congenital or acquired. Such patients require a thorough peri operative assessment and constant cardiac care. There have not been any specific guidelines for management of such patients in literature and optimal anaesthetic management has thus been controversial.

CASE REPORT

We report the case of a 26-year-old female weighing 50 Kg and 155 cm in height primigravida; 37 weeks and 3 days parturient presenting for the safe confinement of pregnancy. She had no history of any known co morbid illness and was well adjusted to a normal lifestyle. The patient developed complaints of breathlessness on exertion after 15 weeks of gestation when on a screening Echocardiography she was diagnosed to have a severe pulmonary stenosis. There were no signs of any right heart failure observed during the course of pregnancy. There was no significant previous surgical or medical history and she had not been on any medication apart from iron,

calcium and folic acid supplements during her entire course of pregnancy.

Pre-anaesthetic examination revealed a baseline heart rate of 81 beats per minute, blood pressure of 110/70 mmHg, and a respiratory rate of 13 breaths per minute with New York Heart Association (NYHA) Functional Classification Class I of dyspnea. On examination, the chest was clear with normal S1, delayed P2 and an ejection systolic murmur in the left parasternal border. Airway examination showed mouth opening >3 finger breadths, modified mallampati grading II and a normal range of neck movements. All the blood investigations including liver and renal function tests were within normal limits with Hemoglobin (Hb) of 10.2 g%. Electrocardiogram (ECG) showed a sinus rhythm with right axis deviation. A 2D Echocardiogram showed severe valvular pulmonary stenosis with a pressure gradient of 72 mm Hg, moderate tricuspid regurgitation, no regional wall motion abnormality and normal LV function.

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Owing to the cardiac condition of the parturient, an elective LSCS was planned under general anaesthesia with rapid sequence induction with invasive intra-arterial blood pressure monitoring and ultrasound-guided bilateral Transverse Abdominis Plane (TAP) block for postoperative analgesia. ICU backup was arranged, in case needed in the postoperative period. On the night before surgery, written informed consent was obtained. The patient was explained about the procedure, risks and high-risk consent was taken for perioperative cardiac complications.

In the pre-operative holding area, a 20G intravenous (I/V) line was secured on non-dominant hand of the parturient and ringer lactate at the rate of 100 ml/hour was started. She also received prophylactic antibiotics and injection ranitidine 50 mg I/V 30 minutes prior to incision. In the operating room, pre-induction monitors i.e., 5 lead ECG, pulse oximetry, invasive blood pressure, in the left radial artery after performing modified Allens test were secured and baseline vitals were recorded. A 15-degree wedge was placed under right hip for left uterine displacement. After adequate preoxygenation with 100% oxygen for 5 minutes and painting and draping the parts, general anaesthesia was induced using a rapid sequence technique with Injection Etomidate 0.4mg/Kg and injection succinylcholine 2mg/Kg I/V. 1.5mg/Kg of preservative-free 2% lignocaine was given 90 seconds prior to intubation to obtund Laryngoscopy response. The trachea was intubated using a 7 mm internal diameter cuffed endotracheal tube under quick and gentle direct laryngoscopy. Parturient was put on volume control mode of ventilation with respiratory rate adjusted to an ETCO₂ of 30-35 mmHg. Anaesthesia was maintained with 50% oxygen, air, sevoflurane and injection vecuronium. After delivery of the baby, 20 U oxytocin infusion and 100 mcg I/V fentanyl were given. Before reversal, under sterile aseptic precautions, bilateral ultrasound-guided TAP block was given with a curvilinear probe kept parallel to the inguinal ligament. External oblique, internal oblique, and transverse abdominis were identified just above the anterior superior iliac spine. A 15 ml solution of 0.125% Bupivacaine and 8mg Dexamethasone was injected on each side in the plane between transverse abdominis and internal oblique muscles. After spontaneous efforts of respiration were resumed by parturient, the neuromuscular blockage was reversed with 0.05mg/Kg of neostigmine and 0.01mg/Kg glycopyrrolate and parturient was extubated after thorough suctioning. Patient's vitals were stable throughout the procedure and 1000 ml of crystalloids were administered to patient with a urine output was 400 ml. Estimated blood loss was around

400 ml. A female baby weighing 3kg with APGAR scores of 8 and 10 at 1 and 5 minutes respectively was born. Her postoperative course in the hospital was uneventful. Post operative pain assessment was done at 12, 24 and 36 hours post operatively using VAS score (0 = no pain, 10 = worst pain possible). It was zero at 12 hours, 2 at 24 hours and 4-5 at 36 hours. Rescue analgesic injection paracetamol 1 gram I/V was given at 36 hours post operative. She was discharged after 3 days.

DISCUSSION

Pulmonary stenosis presents as an obstruction to right ventricular outflow leading to increased right heart workload and also reduced forward flow causing a reduction in cardiac output. This if associated with pregnancy, can prove significantly detrimental to both mother and foetus, and due to additional hemodynamic burden apart from the physiological changes in circulation that take place.

Anaesthetic goals of management include maintenance of an adequate preload, reduction in pulmonary vascular resistance, low normal heart rate, and a normal systemic vascular resistance. There have not been many articles describing the anaesthetic management in such cases in the literature. In a case report by Sanikop *et al*, anaesthetic management of a similar case with a pressure gradient of 68mmHg has been described². They gave general anaesthesia with Rapid Sequence Induction (RSI) using thiopentone and succinylcholine along with epidural analgesia for their case. In our case, we also planned for a RSI but used etomidate as the inducing agent as it is a more cardiostable drug. Even though Epidural analgesia is considered as a gold standard for post operative pain relief in such patients, we preferred a bilateral single shot USG guided TAP block. TAP block if, given as a single shot block, can give adequate pain relief for upto 48 hours or more depending on the additives given along with local anaesthetic mixture³. It thus avoids continuous catheter maintenance and needs for repeated boluses as usually needed in case of an epidural. TAP block is also associated with a better hemodynamic profile with the much lesser incidence of hypotension as compared to epidural infusions.

Another thing that has an important role in successful management of such cases is as discussed by Shah *et al* in their case report is administration of an adequate peripregnancy counseling and involvement of a multidisciplinary approach including appropriate interventions by obstetrician, cardiologist, cardiothoracic

surgeons, anaesthesiologists, and intensivists can result in a better and successful outcome in such cases⁴.

CONCLUSION

Isolated pulmonary stenosis is a rare entity seen with respect to the spectrum of cardiac diseases. With increasing severity in its magnitude and if associated with altered hemodynamic conditions like pregnancy, it can pose a challenging condition for the anaesthesiologist. Therefore, a sequential approach with involvement of cardiologist, obstetrician, anesthesiologist, and intensivist along with properperi-pregnancy counseling can help prevent mortality and morbidity with improved outcome.

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