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Anaesthetic management of a parturient with an incidental large fossa ovalis undergoing elective caesarean section

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Abstract

The fossa ovalis, a remnant of the foramen ovale, usually closes after birth. Timely identification and treatment of cardiac issues during pregnancy are essential to prevent harm to both the mother and the fetus. A 28-year-old primigravida, 36 weeks and 4 days pregnant, presented with symptoms of palpitations and dyspnea. Echocardiography revealed a 2.5 cm fossa ovalis with an atrial septal defect (ASD) and a left-to-right shunt. Epidural anesthesia was administered, and no significant intraoperative complications were observed.

Keywords: Atrial septal defect, caesarean section, epidural anaesthesia

Introduction

Case report

A 36 weeks and 4 days, 28-year-old primigravida presented with complaints of palpitations and dyspnea. Before experiencing these symptoms in the third trimester, her pregnancy had gone smoothly and she had no past history of heart illness. Her vital signs were steady upon physical examination, and there were no indications of peripheral edema, clubbing, or cyanosis. Auscultation revealed a loud, wide, fixed splitting of the second heart sound and a systemic flow murmur over the left 2nd intercostal space [1]. ECG revealed complete right bundle branch block, right axis deviation, and inverted T waves. Chest X-ray showed prominent pulmonary vascular markings with cardiac enlargement [1].

Upon echocardiography, a 2.5 cm big fossa ovalis ASD with a left-to-right shunt was discovered. No signs of paradoxical embolism, right heart failure, or pulmonary hypertension were found. The results of routine laboratory testing, such as coagulation profile, renal function, and haemoglobin levels, were within normal ranges.

A multidisciplinary team of obstetricians, cardiologists, and anaesthetists made the decision to proceed with an elective caesarean section under epidural anaesthesia due to the hemodynamic significance of the ASD. In order to decrease hemodynamic oscillations and lower the possibility of an abrupt shunt reversal, this strategy was selected. High-risk consent was taken from the patient and the patient's attendants in view of the cardiac anomaly.

Anaesthetic Management

On the day of surgery, the patient was taken to the operating room, where a large-bore IV cannula was secured in the non-dominant forearm and Ringers lactate solution was started. Inj. Ondansetron 8 mg and Inj. Metoclopramide 10 mg were administered, along with Inj. Ceftriaxone 1g after test dose. Standard monitoring was initiated with continuous ECG monitoring for vigilance to maintain the heart rate. Non-invasive blood pressure (NIBP) monitoring was used along with intra-arterial blood pressure monitoring for precise hemodynamic control. Central venous catheterization for CVP monitoring was avoided to prevent chances of venous air embolism. Pulse oximetry was attached to ensure adequate oxygenation, which was supplemented with oxygen via face mask at 5L/min to counteract hypoxia-induced ischemic episodes. A pre-procedural arterial blood gas (ABG) analysis was conducted, revealing normal pH, PaCO₂ and PaO₂ levels, indicating stable respiratory function [1, 2].

Patient was put in sitting position, and under strict aseptic precautions, epidural anaesthesia was initiated using an 18 G Tuohy needle at the L1-L2 interspace. A test dose of 3 mL of 2% lignocaine with adrenaline was administered to rule out intravascular placement. Following confirmation of correct placement, incremental doses of 0.25% bupivacaine were given to establish an adequate block level. To prevent sudden drops in systemic vascular resistance and preload, the epidural block was achieved gradually, ensuring stable hemodynamics throughout induction. Sensory block up to the 7th thoracic dermatome was achieved [1]. Baby was delivered within five minutes with an APGAR score of 9 at 1 minute and 10 at 5 minutes [6]. Uterotonic of choice Inj Carbetocin 100mcg was administered IM. Adequate uterine contraction was achieved. Oxygen supplementation with 5 L/min via a face mask was provided to prevent hypoxia, and intraoperative fluid management was carefully restricted to avoid excessive volume overload, which could worsen right ventricular strain. Top-up doses of 0.25% bupivacaine were administered every 30 minutes to maintain an adequate sensory level. Careful titration of vasopressors, such as phenylephrine, was done to counteract any hypotension while avoiding excessive afterload increase. Adequate urine output was maintained, and the estimated blood loss was 200-250 mL [3]. Postoperatively, the patient was monitored in the intensive care unit for 24 hours to ensure stable hemodynamic and oxygenation. She was subsequently shifted to the obstetric ward for routine postpartum care and was discharged on postoperative day 5 with stable vitals.

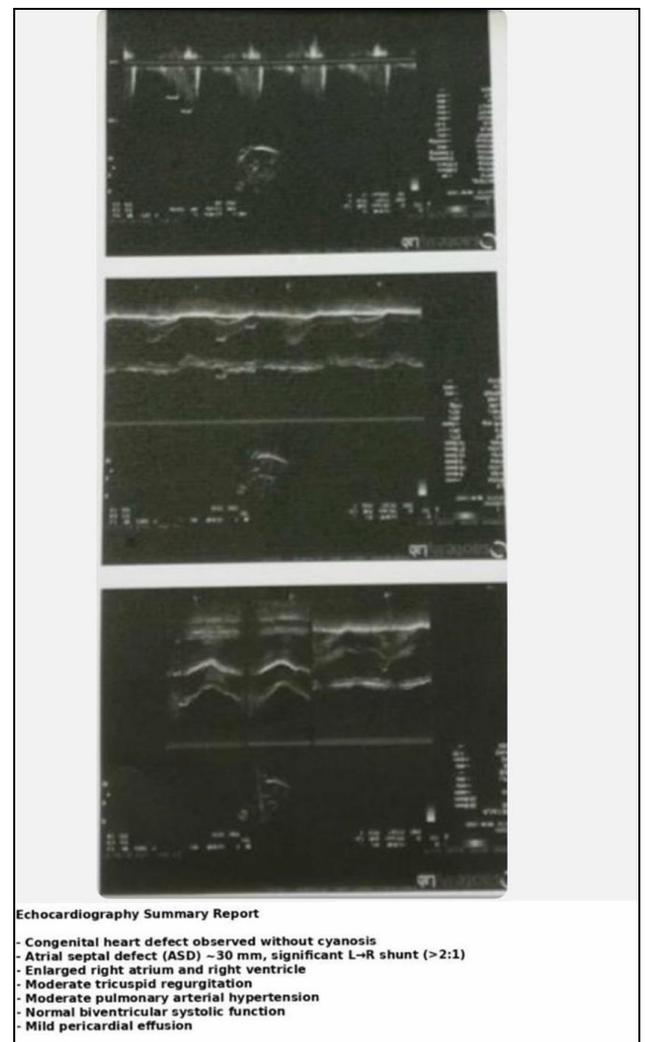
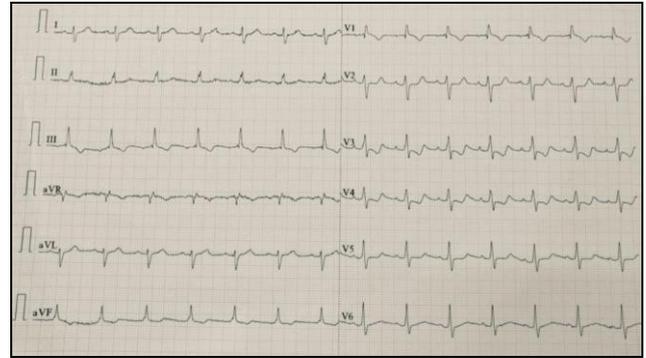
Discussion

Pregnancy in patients with congenital heart disease, particularly ASD, poses significant challenges due to increased circulatory demands. In patients with a large ASD and left-to-right shunt, pregnancy-related increases in blood volume and cardiac output can exacerbate right ventricular overload, increasing the risk of atrial arrhythmias, paradoxical embolism, and pulmonary hypertension.

Anaesthetic management must be carefully tailored to prevent factors that could lead to right-to-left shunting, including hypotension, hypoxemia, hypercarbia and fluid overload and or arrhythmias, which can all lead to exacerbation of the shunt and cause deoxygenated blood to enter into systemic circulation [3].

There is no evidence based recommendation to guide the anaesthetic management of patients with ASD, and it is impossible to propose a single approach for all cases, given the large scope of abnormalities. Whichever approach chosen should fulfill the anesthetic goals of the case, which are to maintain a balance between pulmonary and systemic flow and maintain tissue oxygen delivery. General anaesthesia is generally avoided when given a choice, in pregnant females, as they are deemed full stomach. It also poses the disadvantage of difficult airway, and intubation may result in a stressor response contributing to hemodynamic instability [3]. Spinal anaesthesia was avoided due to the risk of an abrupt decrease in systemic vascular resistance, compromising maternal and fetal circulation [2].

Epidural anaesthesia was preferred as it provides a controlled and gradual onset of sympathetic blockade, preventing sudden hemodynamic changes. It also provides the patient with better pain control, both intra and postoperatively, reducing the stress response with surgery [6].



Conclusion

This case demonstrates the successful perioperative management of a pregnant patient with a large ASD undergoing elective caesarean section under epidural anesthesia. Epidural anesthesia remains a preferred technique for such patients, offering stable hemodynamics and reduced risks of shunt reversal and embolic complications.

This case highlights the importance of individualized anesthetic strategies to ensure the safety of both the mother and baby.

Abbreviations

- **ASD:** Atrial Septal Defect.
- **ECG:** Electrocardiogram.
- **IV:** Intravenous.

- **CVP:** Central Venous Pressure.
- **IM:** Intramuscular.

Conflict of Interest

Not available

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Not available

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