

Anaesthetic Challenges in a Parturient with Interatrial Septal Aneurysm Posted for Emergency Caesarean Section under Subarachnoid Block: A Case Report

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ABSTRACT

Interatrial Septal (IAS) aneurysm is a rare cardiac anomaly characterised by a localised outpouching of the atrial septum protruding into either atrium. During pregnancy, physiological cardiovascular changes may unmask or exacerbate the haemodynamic consequences of this condition, posing anaesthetic challenges during delivery. IAS aneurysm may be associated with Atrial Septal Defect (ASD) or Patent Foramen Ovale (PFO) and increases the risk of atrial arrhythmias, thromboembolism, and myocardial dysfunction. We report the anaesthetic management of a 32-year-old gravida 2 abortus one woman at 39 weeks of gestation with an incidental echocardiographic diagnosis of fenestrated IAS aneurysm, posted for emergency caesarean section due to foetal distress. The patient had a history of hypothyroidism on treatment and a resolved antiphospholipid antibody syndrome. Preoperative evaluation revealed stable haemodynamics with no evidence of active cardiac dysfunction or arrhythmias. Subarachnoid block was administered using low-dose hyperbaric bupivacaine, with prophylactic low-dose noradrenaline infusion initiated to prevent hypotension. Intraoperative haemodynamics remained stable, with no arrhythmias or embolic events. Both maternal and neonatal outcomes were favourable. This case highlights the importance of meticulous preoperative assessment, vigilant intraoperative monitoring, and proactive haemodynamic management in parturients with IAS aneurysm. Neuraxial anaesthesia can be safely administered in asymptomatic patients when haemodynamic goals are carefully maintained. Early recognition and tailored anaesthetic planning contribute significantly to optimal maternal and foetal outcomes.

Keywords: Pregnancy, Septum, Spinal

CASE REPORT

A 32-year-old woman G2A1 at 39 weeks of gestation presented to the Department of Obstetrics and Gynaecology with complaints of acute onset lower abdominal pain of four hours duration, progressive in intensity, associated with reduced foetal movements. There was no history of leaking or bleeding per vaginum. She was planned for an emergency caesarean section in view of foetal distress. Pre-operative evaluation was done. She was a known case of hypothyroidism for the past two years and was on tablet Thyronorm 25 mcg orally once daily before food. The patient had a previous diagnosis of antiphospholipid antibody syndrome, with no evidence of active disease at presentation. There was no history of diabetes mellitus, hypertension, bronchial asthma, or cardiac symptoms such as dyspnoea, palpitations, or syncope.

On general examination, the patient was conscious and oriented. Her heart rate was 98 beats/min, blood pressure 130/80 mmHg, respiratory rate 18/min, and oxygen saturation 97% on room air. Systemic examination revealed normal heart sounds with no added murmurs and clear lung fields.

The electrocardiogram showed sinus tachycardia {Heart Rate (HR)-110/min}. Echocardiography performed antenatally revealed a fenestrated IAS aneurysm with preserved left ventricular systolic function and no evidence of shunt. Thyroid function tests showed T3: 1.12 ng/mL, T4: 8.6 µg/dL, and TSH: 2.1 µIU/mL. Lupus anticoagulant, anticardiolipin antibodies, and antiphospholipid antibody levels were within normal limits. The patient was classified as the American Society of Anaesthesiologists (ASA). physical status IIE.

After informed written consent, aspiration prophylaxis was administered. In the operating room, standard ASA monitors were attached. Baseline vitals were heart rate 106/min, blood pressure 128/68 mmHg, and SpO₂ 97%. An 18-G intravenous peripheral

cannula was secured, and Ringer's lactate infusion started. Prophylactic noradrenaline infusion was initiated at 0.02 µg/kg/min before spinal anaesthesia to prevent hypotension. Under strict aseptic precautions, a subarachnoid block was administered in the left lateral position using 10 mg of 0.5% hyperbaric bupivacaine with a 25-G Quincke needle.

After achieving a sensory level of T4, surgery commenced. A healthy neonate was delivered with an immediate cry. Oxytocin 20 units were administered intravenously. Noradrenaline was titrated to 0.01 µg/kg/min and discontinued towards the end of surgery. The duration of surgery was approximately two hours, with an estimated blood loss of 850 mL. The patient received 1500 mL of crystalloids, maintained stable haemodynamics intraoperatively, and had a urine output of 450 mL. No hypotension or arrhythmias were observed intraoperatively. Postoperatively, the patient was monitored closely. She was haemodynamically stable with good urine output, adequate pain relief through systemic analgesics.

DISCUSSION

An IAS aneurysm, also referred to as atrial septum aneurysm, is defined as a localised saccular protrusion of the interatrial septum exceeding 10 mm beyond the plane of the atrial wall. The reported prevalence ranges from 1-2.5% in the general population, and it may exist as an isolated finding or in association with ASD or PFO [1]. Although often asymptomatic, an IAS aneurysm gains clinical significance during pregnancy due to the physiological cardiovascular changes such as increased blood volume, cardiac output, and hypercoagulability, which may predispose to arrhythmias, thromboembolism, and haemodynamic instability [2].

Several case reports have described IAS aneurysm diagnosed during pregnancy with varied clinical presentations. Altraigey A et al.,

reported a third-trimester pregnant woman with an IAS aneurysm presenting with palpitations and chest discomfort, managed conservatively with close cardiology and obstetric follow-up, resulting in a favourable maternal and foetal outcome [3]. Similarly, Lakshmi A et al., described an incidental diagnosis of IAS aneurysm during antenatal evaluation, emphasising the importance of serial echocardiographic monitoring and multidisciplinary care throughout pregnancy and delivery [4]. These reports suggest that an isolated IAS aneurysm without significant shunt or ventricular dysfunction can often be managed expectantly.

Data beyond isolated case reports have also highlighted potential obstetric implications. In a prospective cohort study by Bozkaya VÖ et al., pregnancy outcomes in women with atrial septal aneurysm were analysed, revealing a higher incidence of obstetric complications such as preterm labour, oligohydramnios, and foetal growth restriction, although most patients achieved successful term delivery [5]. This underscores the need for heightened surveillance even in asymptomatic patients. Additionally, prenatal and perinatal literature has demonstrated that atrial septal aneurysm may be associated with atrial arrhythmias and altered intracardiac flow patterns, further supporting careful maternal cardiac evaluation [6,7].

From an anaesthetic perspective, limited but growing literature addresses the management of parturients with an IAS aneurysm. Priyanka A et al., reported successful spinal anaesthesia for emergency caesarean section in a patient with atrial septal aneurysm, highlighting the importance of maintaining stable haemodynamics and avoiding sudden reductions in preload [8]. In our case, similar principles were applied, with the use of prophylactic low-dose noradrenaline infusion to prevent spinal-induced hypotension. Despite an estimated blood loss of 850 mL, haemodynamic stability was maintained through judicious fluid administration and vasopressor titration, without precipitating arrhythmias or myocardial compromise.

Alternative anaesthetic techniques described in the literature include graded epidural anaesthesia, which allows gradual sympathetic blockade and controlled haemodynamic changes, and general anaesthesia, which may be indicated in patients with significant shunts, pulmonary hypertension, or haemodynamic instability [9]. General anaesthesia was avoided in our patient to minimise sympathetic surges during laryngoscopy, the effects of positive pressure ventilation on venous return, and the potential risk of paradoxical embolism. The case reported by Karaaslan E involving emergency caesarean section in a patient with ASD reinforces these

considerations and supports individualised anaesthetic planning in patients with IAS abnormalities [10].

Overall, available literature, although limited predominantly to case reports and small series, suggests that neuraxial anaesthesia can be safely administered in asymptomatic parturients with IAS aneurysm when meticulous haemodynamic monitoring and proactive management strategies are employed.

CONCLUSION(S)

The IAS aneurysm, though rare in pregnancy, presents unique anaesthetic challenges due to the potential risk of haemodynamic instability and arrhythmias. Thorough preoperative assessment and multidisciplinary planning are crucial to optimise maternal and foetal outcomes. Careful selection of the anaesthetic technique with clearly defined haemodynamic goals is essential in such patients. Prophylactic vasopressor infusion can effectively prevent spinal-induced hypotension and help maintain cardiovascular stability. Neuraxial anaesthesia can be safely administered in asymptomatic patients with preserved cardiac function when meticulous monitoring is ensured. Early recognition and individualised anaesthetic management play a key role in achieving favourable perioperative outcomes.

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