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Regional Anaesthesia in a Patient with Large ASD with the Neck of Femur Fracture with Intellectual Disability-A Communication Barrier!!! A Case Report

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Keywords: Atrial septal defect; Spinal anaesthesia; Epidural anaesthesia; Adrenaline; Pulmonary artery hypertension; Intellectual disability.

Abstract

Background: Atrial Septal Defect (ASD) is one of the frequent congenital heart defects in adult population. A large ASD causes a shunting of blood from the left to the right side of the heart, overloading the right ventricle and causing right ventricular hypertrophy, Pulmonary Hypertension (PAH), atrial fibrillation, and shunt reversal (Eisenmenger syndrome)

Case presentation: We report the management of a 34-year-old, intellectually disabled male patient posted for open reduction and internal fixation of left femur with a large ASD and moderate pulmonary hypertension. 2D echo showed large ostium primum ASD measuring 34 mm (Left to Right shunt)/ moderate Tricupid Regurgitation/ moderate PAH/ moderate MR/ LVEF~60%. He underwent the procedure under regional anaesthesia with prophylactic adrenaline infusion.

Conclusion: Non-cardiac surgeries can be conducted without difficulty under regional anaesthesia in patients with significant pulmonary hypertension and a large ASD with careful preoperative evaluation, preparation, and prophylactic adrenaline infusion.

Introduction

One of the most frequent Congenital Heart Defects (CHD) identified in adults is an Atrial Septal Defect (ASD). ASDs affect 0.88 out of every 1,000 patients in adults [1]. Most people are typically asymptomatic and discovered by chance in their third and fourth decades of life. Increases in pulmonary blood flow can occasionally cause pulmonary vascular remodelling, which can impact end-organ perfusion, shunt direction, and the onset of pulmonary arterial hypertension [2]. Because of the chronic stretching of the atrial wall, a large ASD causes a shunting of blood from the left to the right side of the heart, overloading the right ventricle and causing right ventricular hypertrophy, Pulmonary Hypertension (PAH), atrial fibrillation, and shunt reversal (Eisenmenger syndrome) [3,4]. In order to successfully manage ASD patients undergoing non-cardiac surgery, alterations in Systemic Vascular Resistance (SVR) and Pulmonary Vascular Resistance (PVR) are crucial.

We describe the effective treatment of a patient with a large ASD, moderate PAH, and intellectual disability who underwent Open Reduction and Internal Fixation (ORIF) for a left neck of the femur fracture with Dynamic Hip Screw insertion (DHS) under regional anaesthesia.

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Case

A 34-year-old. intellectually disabled male patient with no known comorbidity, presented with a complaint of inability to bear weight in the left lower limb. He had a history of fall from height (10 feet) 2 days back. There was no history of loss of consciousness, vomiting, Ear, nose, throat bleeding, seizures, or headache. There was no previous history of breathlessness on exertion, chest pain, or palpitation. ASD was diagnosed during the pre-anaesthetic workup by 2D echocardiography. The airway assessment showed a mouth opening of three fingers, Mallampati class II, a thyromental distance of 6.5 cm, and adequate neck mobility. The trachea was in midline. A wide split S2 was heard in the pulmonary area on auscultation, and the air entry was equal in bilateral lung fields.

Preoperative blood investigations were normal. The NCCT pelvis with bilateral hip joint revealed a **comminuted displaced fracture of the neck of femur.** 2D ECHO revealed situs solitarus/ levocardia/ left-sided arch/ large ostium primum ASD measuring 34 mm (LtoR shunt)/ moderate TR/ moderate PAH/ moderate MR/ LVEF~60%. ECG showed T wave inversion in leads V1-V5 and CXR showed cardiomegaly. The patient was planned for the left neck of femur ORIF with DHS.

The patient and the attendee were explained and counselled about the plan of anesthesia, which is Spinal Anesthesia (SA) with Epidural Anesthesia (EA). The patient was kept nil per oral for 8 hours before surgery and was premedicated with Tab. Alprazolam 0.25 mg the night before surgery and Tab. Ranitidine 150 mg per oral in the morning on the day of surgery. On the day of surgery, in the preoperative area, Intravenous access was secured and an arterial line was inserted in the right radial artery under local anaesthesia (2% lignocaine).

On arrival at the operating room, all standard ASA monitors were attached. Pre-operative vitals blood pressure (BP) 110/80 mmHg, heart rate 56/min, respiratory rate 16/min, and oxygen saturation 98% were recorded. The arterial line was transduced, and continuous BP monitoring was done. The left femoral nerve block was given using the landmark technique with 10 mL of a solution containing 0.25% bupivacaine + 1% Lignocaine to achieve analgesia. After the patient was comfortable to sit, under aseptic precautions, in a sitting position, 18G Tuohy's needle was advanced in the L2-L3 intervertebral space using the loss of resistance to air technique. Loss of resistance was felt at 4 cm and the epidural catheter was inserted and fixed at 10cm. An epidural test dose of 3 mL of 2% lignocaine + Adrenaline (1:200000) was given, and no significant haemodynamic changes nor paraesthesia was complained of by the patient. A 25G spinal needle (quincke) was inserted in L3-L4 intervertebral space and 2 ml of 0.5% hyperbaric Bupivacaine and 25 mcg of fentanyl intrathecally. The patient's vitals remained stable. Since the patient has an intellectual disability, checking the level of anaesthesia through communication was challenging. We used blunted needle to check for sensation at different levels. On careful observation, we noticed that the patient was wincing and moving his head side to side on perceiving the pinprick, which we used as our guide to determine the sensory level of neuraxial blockade. The initial sensory level achieved was till T8 dermatome. The epidural infusion with 0.5% Bupivacaine was started at the rate of 5 mL/hr and the sensory level was checked every hour. Crystalloids were used for the replacement of fluid deficit and maintenance at the rate of 90 mL/hr. During the two-hour surgery, the patient's haemodynamics, temperature, and input-output were stable. The patient was then shifted to PACU.

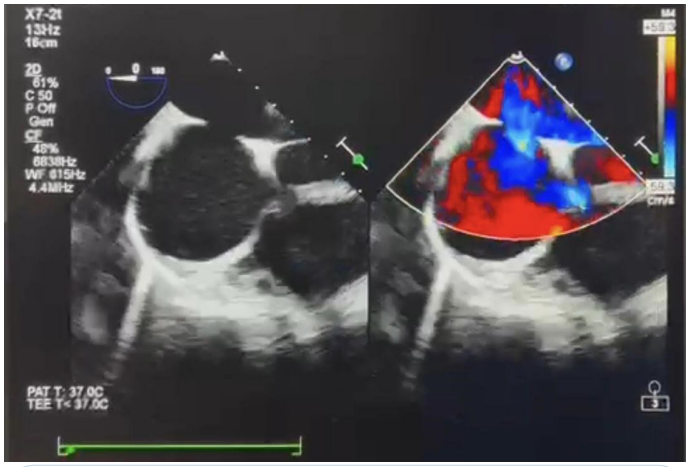

Figure 1: 2D ECHOCARDIOGRAPHY SHOWING 34 MM ASD.

Discussion

Increased right-sided overload from a larger ASD leads to right ventricular hypertrophy and pulmonary hypertension, which have a major impact on hemodynamic stability. The patients may exhibit a variety of signs and symptoms, such as fatigue, dyspnea, palpitations, and an intolerance to effort. Cyanosis and heart failure may develop in the patient when the condition worsens and the shunt is reversed. Due to increased pulmonary blood flow, increasing left to right shunt can result in right-sided heart failure and recurring chest infections. When a patient experiences a transient ischemic attack, a stroke, and peripheral arterial embolism, paradoxical embolism should be suspected [5].

Preoperative echocardiography is often reserved for patients with symptoms suggestive of an underlying cardiorespiratory illness and is frequently avoided in people with minor symptoms [6]. Another important consideration is the timing of the preoperative echocardiogram because many patients had their evaluation done far earlier than their scheduled procedure because of the lengthy surgical waiting times. As a result, the pathophysiology of the condition may drastically worsen, providing unforeseen challenges for anesthesiologists. Anaesthesiologists now routinely use perioperative point-of-care echocardiography as a critical monitoring modality in today's challenging settings.

In our case, the patient was assessed heart sounds by auscultation split S2 demonstrated large ostium primum ASD with moderate pulmonary artery hypertension. Just before surgery, we followed institutional protocol by performing a transthoracic echocardiogram in the preoperative room for patients with confirmed heart disease to verify the previous findings and assess the progression of disease. Since it was a large ASD (34 mm) cardiothoracic surgeon's opinion was done, and there was no active surgical intervention required. GA+EA has been the most often utilized anaesthesia approach in this surgical procedure, although it is also crucial to prepare for potential complications during GA in these patients, including air embolism during vascular access, heart block, dysrhythmias (5-10%), and heart failure, and uncontrolled hemodynamic surges that could reverse intracardiac shunt [7]. To prevent a reduction in SVR that could happen right after SA, we used a regional anaesthesia method that included low-dose combined spinal-epidural anaesthesia, and intravenous adrenaline infusion. Because it reduces the danger of abrupt cardiac failure, which would have been harmful, adrenaline was recommended. The use of nasal prongs to deliver more oxygen was carried out since severe PAH

might benefit from it. We were able to achieve greater hemodynamic stability and prevent sympathetic stimulation, which can happen during intubation and extubation in GA and have a negative impact on SVR and PVR [8]. Intraoperatively, all factors like hypoxemia, hypercarbia, hypothermia were avoided which could cause a reversal of shunt or increased shunt fraction, fatal arrhythmias and congestive heart failure. Epidural analgesia was used postoperatively to maintain appropriate analgesia since discomfort might significantly increase SVR. Combined spinal-epidural anaesthesia and using adrenaline sparingly can improve perioperative hemodynamic stability and analgesia.

Conclusion

Non-cardiac surgeries can be conducted without difficulty under regional anaesthesia in patients with significant pulmonary hypertension and a large ASD with careful preoperative evaluation, preparation, and prophylactic adrenaline infusion.

References

1. Marelli AJ, Ionescu-Ittu R, Mackie AS, et al. Lifetime prevalence of congenital heart disease in the general population from 2000 to 2010. Circulation. 2014; 130: 749-56.
2. Stout KK, Daniels CJ, Aboulhosn JA, et al. 2018 AHA/ACC Guideline for the Management of Adults With Congenital Heart Disease: Executive summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2010; 139: e637-97.
3. Neema PK. Eisenmenger syndrome: An unsolved malady. Ann Card Anaesth. 2012; 15: 257-8.
4. Maximilian G, Posch, et al. Clin Res Cardiol. 2010; 99: 137-147.
5. Ward R, Jones D, Haponik EF. Paradoxical embolism. An underrecognized problem. Chest. 1995; 108: 549-58.
6. Cowie BS. Focused transthoracic echocardiography in the perioperative period. Anaesthesia and intensive care. 2010; 38: 823-36.
7. Howard-Quijano K, Smith M, Schwarzenberger JC. Perioperative care of adults with congenital heart disease for non-cardiac surgery. Current Anesthesiology Reports. 2013; 3: 144-50.
8. Weiss B. Pulmonary vascular disease and pregnancy: Current controversies, management strategies, and perspectives. European Heart Journal. 2000; 21: 104-15.