

Original Article

Anaesthetic Management In A Patient Of Severe Aortic Stenosis With Aortic Aneurysm: A Case Report

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Abstract: Aortic valve shrinkage can lead to mild, moderate or severe Aortic stenosis (AS). We report the case of a 70 yr old female with severe AS with aortic aneurysm with intertrochantric fracture femur for dynamic hip screw (DHS) fixation under Femoral nerve (FN) with lateral femoral cutaneous nerve of thigh (LFCN) block.

Keywords: severe aortic stenosis, intertrochantric fracture, dynamic hip screw, Femoral Nerve, Lateralcutaneous nerve of thigh, block.

Introduction:

Since the implementation of protocols for pre-anaesthesia assessment, anaesthetists play a crucial role in optimizing the outcomes of the process of anaesthesia and surgery. This goal is more critical still in patients with heart disease, and guidelines have been developed to provide recommendations on the care for these patients.^{1,2}

Aortic stenosis is a progressive disease that may remain asymptomatic for decades with an associated low mortality. As severity progresses, there is increased left ventricular outflow obstruction and reduced left ventricular compliance leading to a reduction in myocardial function and reduced cardiac output. There is no definitive evidence that medical treatment can retard disease progression or impact on symptoms or survival. Severe but asymptomatic AS is associated with a risk of sudden death of <1%.^{3,4}

Severe AS is defined as Vmax of ≥ 4.0 m/s or mean gradient of ≥ 40 mmHg. The classic symptoms in a patient with severe AS are angina and syncope and congestive heart failure (CHF). Life

expectancy in untreated patients is approximately five years after developing angina; 3yrs after developing syncope and 2yrs after developing CHF. Angina is present in 66% patients of Severe AS but only 50% have clinically developed coronary artery disease (CAD). Patients without CAD develop angina because of inadequate oxygenation of hypertrophied myocardium. AS is the commonest indication for valve replacement with ~2% of the population aged more than 65 yr and 4% aged more than 85 having severe AS.³ Surgical aortic valve replacement (AVR) remains the gold-standard intervention for improving life expectancy and quality. For patients whose operative risk is prohibitive, or where technical limitations to surgical replacement exist, newer minimally invasive interventions such as transcatheter aortic valve implantation (TAVI) are now considered.

Case Report:

70 yr old female with no known underlying comorbidities was admitted on 13/07/2023 with intertrochanteric fracture femur was planned for DHS fixation. Patient was not on any kind of medication. There was no history of palpitations, syncope or PND. General physical examination was within normal limits. Pulse was 80 bpm, regular, good volume BP 100/61 mmHg Spo2 on room air was 88 -90%.

Airway examination revealed mouth opening of 2 finger breadth and MPS-I.

On systemic examination, no added sounds on chest auscultation.

Laboratory investigations revealed Hb- 9.7 g/dl, P.C-1.5 Lac, BUN/CREAT-46/1.7, Na/K-138/5.1, PT/INR- 14.9/1.09.

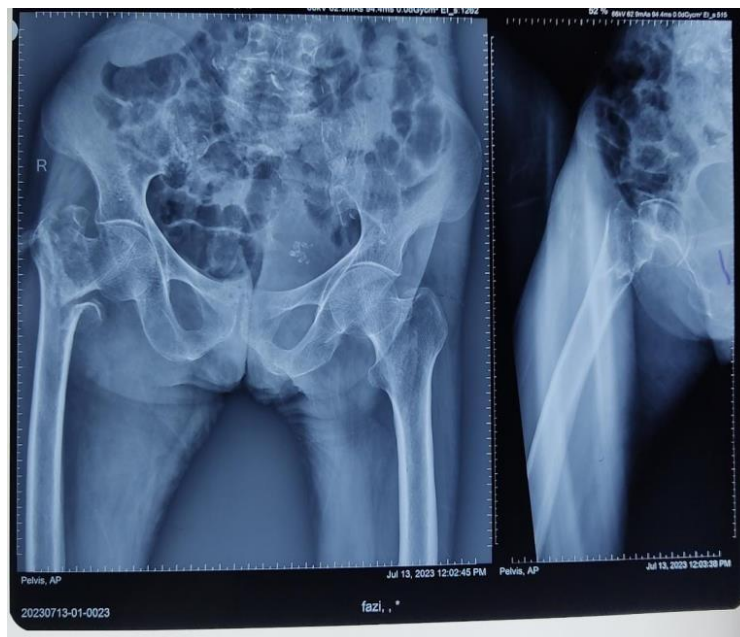


Fig. 1: Intertrochanteric fracture right femur.

Two days after admission on 15/07/2023 patients Spo2 dropped to 78-80% on room air. CTPA was done which revealed nothing. Then HRCT was done that revealed bronchopneumonia and ascending thoracic aortic aneurysm (incidental finding).

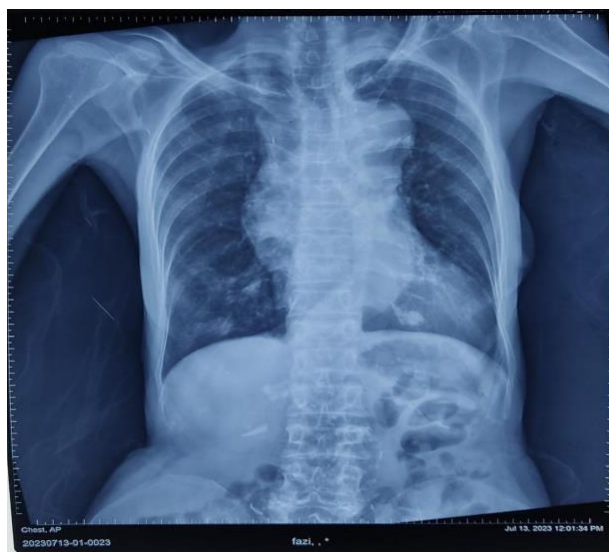


Fig 2: Basal infiltrates left lung

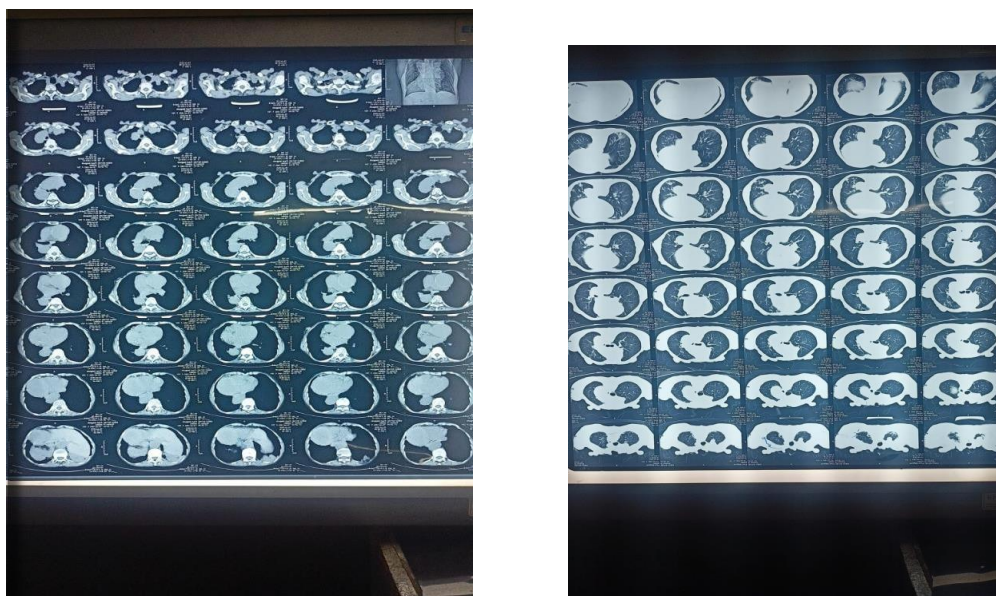


Fig 3: HRCT lungs showing bronchopneumonia and revealing ascending aorta aneurysm as an incidental finding.

Patient was put on broad spectrum antibiotics and other relevant symptomatic treatment for bronchopneumonia for 5 days.

Later Echocardiography was done before proceeding for elective DHS fixation procedure. Echocardiography revealed:

Ejection fraction=65%

Severe AS (Vmax of 5.87m/s/Mild AR/mild TR;concentric LVH/Grade II diastolic dysfunction;

Ascending thoracic aortic aneurysm (size=5.5cm). Another incidental finding on Echocardiography was severe AS.

Patient was put on beta blocker before proceeding further for elective DHS fixation.

Patient was scheduled for elective DHS fixation on 23/7/2023.

Anaesthetic management:

Patient was classified as ASA III physical status and a written and informed consent was obtained. Preoperatively patient was continued on beta blockers prior to surgery.

Preoperative vitals were as follows:

Pulse-80bpm, BP 110/73 mmHg, Spo2-87-90% on room air.

A peripheral vein was secured using 18 gauge cannula and crystalloid infusion was started. Supplemental oxygen of 3 liters was given through nasal prongs.

Regional block (FN and LFCN of thigh block) was planned. However, all preparations for general anaesthesia were made with consent for post operative ventilation taken in case regional block failed to provide anaesthesia. Patient was put in supine position and under all aseptic precautions USG guided FN with LFCN of thigh block was given using 15ml of 0.5% Ropivacaine and 5ml of 0.5% Ropivacaine respectively. Patient lost sensation and motor response in the desired area within 20 minutes. Intraoperative monitoring along with input output charting was done. Surgical procedure was completed in 35 minutes. During this period patient remained hemodynamically stable with no episode of hypotension and tachycardia. Spo2 remained within the range of 93-97% on oxygen via nasal prongs. Blood loss was approximately 100ml with total input of 800ml of crystalloid.

Postoperatively patients monitoring of vitals and input output charting was advised along with continuation of O2 inhalation via nasal prongs. Patient was discharge after 10days in a stable condition.

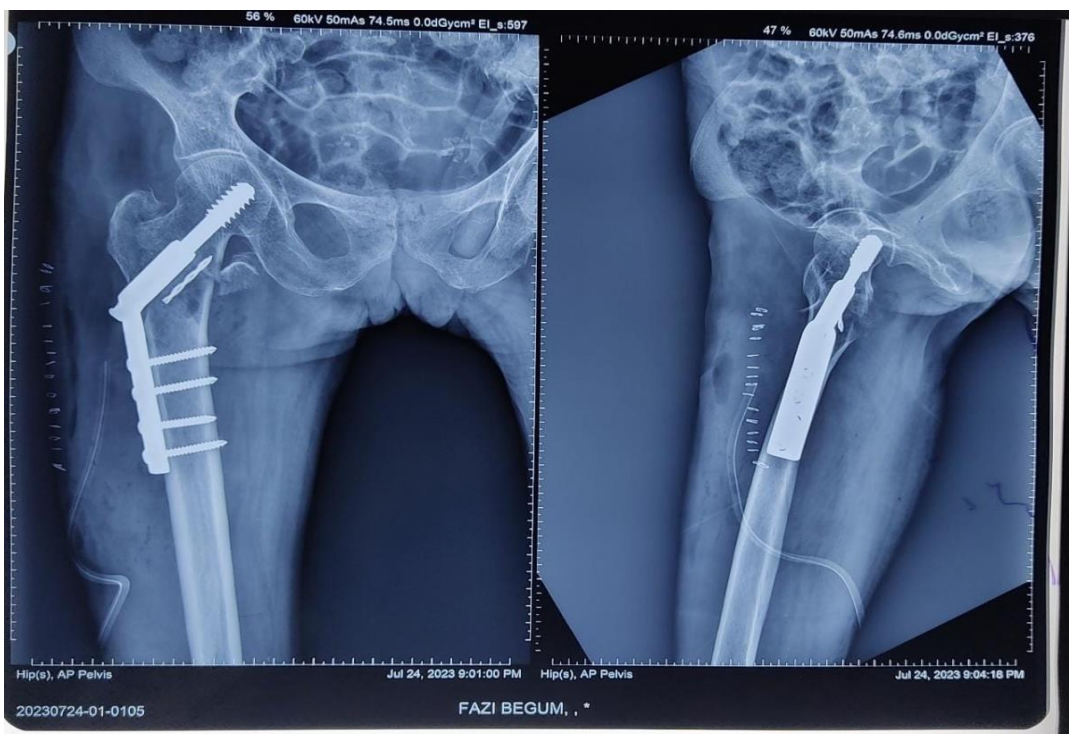


Fig 4: Post DHS view of right hip.

Discussion

Goldman and colleagues identified severe AS as a risk factor for perioperative cardiac complications in non-cardiac surgery in 1977.⁵ AS is most often a degenerative disease that is

increasing in incidence as people live longer; it occurs frequently in patients with significant comorbidities. The condition is often unrecognized before death and post-mortem data suggest an end of life incidence of 1%. The natural history of the disease is of a long asymptomatic latent period followed by the onset of characteristic symptoms. If the obstruction remains unrelieved, the average survival after the onset of angina or syncope is 2–3 yr with the development of CHF it is only 18 months.⁶

There are three cardinal symptoms in AS; angina, syncope and dyspnoea. However, symptoms do not correlate well to the severity of the stenosis and some patients with small valve areas can be asymptomatic.

Although patients with aortic stenosis are at an increased risk of perioperative cardiac events, they can undergo non-cardiac surgery relatively safely provided that the condition is recognized and appropriate monitoring and management put in place.⁷ The early detection and treatment of hypotension and arrhythmias are essential.

Anaesthetic implications:

Central regional anaesthesia is traditionally regarded as a contraindication in severe AS patients. Spinal anaesthesia blocks sympathetic nervous system that could potentially precipitate hypotension and myocardial ischaemia.

General anaesthesia, peripheral regional blocks or titrated epidural block can be used safely in such patients. Limb blocks can be useful, either alone or combined with general anaesthesia, as their effects on the sympathetic tone is more limited. The goal in Anaesthetic management of such patients should be avoidance of hypotension and arrhythmias.

The case we are discussing is worth reporting as the patient in question had three risk factors for Anaesthetic management; Severe AS, Aortic aneurysm and Bronchopneumonia. Severe AS and aortic aneurysm were both the incidental findings.

We preferred Limb block (FN with LFCN block) for our patient to avoid hemodynamic instability that might have occurred because of spinal block and to avoid intubation with elective ventilation in already bronchopneumonic patient.

Since patients with severe AS have limited stroke volume, any major reduction in systemic vascular resistance may result in sudden fall in perfusion pressure; therefore, spinal anaesthesia in patient with severe AS should be avoided. The current American College of Cardiology (ACC) guidelines recommend aortic valve surgery⁸ before elective non-cardiac surgery in symptomatic severe AS patients. In some clinical circumstances, aortic valve surgery cannot be performed due to high surgical risk or patient refuses aortic valve surgery. In such situation, it is important to determine which anaesthesia technique has the lowest risk for these patients for undergoing non-cardiac surgery.⁹ Here, we are discussing the anaesthetic management of an elderly female who required a surgery of an emergent nature.

The patient in discussion had bronchopneumonia still on broad spectrum antibiotics not maintaining saturation on room air. General anaesthesia in an elderly female with bronchopneumonia with aortic aneurysm posted for DHS fixation would not be a safe approach. In patients with bronchopneumonia surgery with general anaesthesia may trigger fatal response, known as acute exacerbation (AE). Except for the cases undergoing lung resection, only a few studies have examined the preoperative risk factors for AE of patients with bronchopneumonia, despite high mortality.¹⁰

So our team was left with a limited choice of regional anaesthesia. FN with LFCN block, which blocks the peripheral nerves, produces good anaesthesia and an effective regional technique for DHS fixation; due to the unilateral nature of this block, less change in SVR occurs, compared to central neuraxial blocks. The avoidance of AE of bronchopneumonia by not opting for general anaesthesia.

In summary, this case report presents a successful case of DHS fixation without any cardiac intervention in a patient with severe AS; and simultaneous bronchopneumonia, describing our

preference for FN with LFCN block in a patient with a notably complex clinical picture. Moreover, to our knowledge, this is the first experience of such a case reported in the literature.

Conclusion:

Since severe AS is a fixed cardiac output disorder, it requires a vigilant preoperative assessment and a careful selection of type of anaesthesia. Among regional anaesthesia techniques peripheral regional block is a safe alternative than central neuraxial block.

Conflict of interest: Nil

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