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Case Report

Sciatico femoral block in patient with aortic stenosis

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ABSTRACT

Central neuraxial blocks are contraindicated in patient with aortic stenosis. We report one patient with severe aortic stenosis posted for lower limb surgery. Combined sciatic and femoral nerve block was used as a sole anesthetic technique. Patient was hemodynamically stable in intraoperative as well as in postoperative period. Patient had good postoperative analgesia for 12 hrs. Postoperatively the patient was referred to the cardiologist for further management.

1. Introduction

Aortic Stenosis is commonly encountered in the elderly population. Approximately 1-4% of adults over 65 years of age have aortic stenosis and many of these patients will develop severe obstruction requiring valve replacement therapy. Isolated aortic stenosis without coexisting mitral valve disease, is more common in males and is rarely rheumatic in origin. Patient with a severe valvular cardiac lesion pose anaesthetic challenges due to fixed cardiac output. Both general anaesthesia and regional anaesthesia with central neuraxial blockade carry potential risks.[1] Complete knowledge of pathological changes in a patient with AS is important for anaesthetic management.

2. Case

60 year old, male patient, farmer by occupation suffered trauma to the right lower limb and developed right lower limb cellulitis. Posted for right lower limb debridement. Patient had a NYHA dyspnea grade II since 2 yrs. No history of chest pain, palpitation, syncope, cough, cold, fever. No history of hypertension, diabetes mellitus, bronchial asthma. No any past surgical and medical history.

On general examination Afebrile, P-80/min, BP-108/74 mmhg, RR-14/min. No pallor, Icterus, cyanosis, clubbing, edema, lymphadenopathy. On cardiovascular systemic examination- A harsh systolic murmur grade III was present in all 4 areas without thrill, radiating to carotid Artery. Rest all other systems were normal. On local examination – A wound was present on the anterior surface of the thigh & anterior & medial aspect of the leg. Investigation analysis revealed patient was in sepsis with total leucocytic count of 18,000cells/cu.mm, Hb-10.4gm%, and platelets-3 lakhs, Coagulation profile was normal, rest all other routine investigations WNL, CXR-NAD, 2D ECHO-severe AS, severe TR, severe PAH (PASP-67mmhg), moderate concentric LVH, mild AR, LVEF-45%. Aortic PG/MG – 64/42mmhg, ECG Suggestive of normal sinus rhythm. Cardiologist opinion was taken, advised Aortic valve replacement but since this was an emergency procedure we posted the patient with high risk consent.

Plan of anaesthesia-USG and PNS guided Right Sciatico-femoral Block.

3. Nerve Distribution of Sciatic & Femoral Nerve

Femoral nerve supplies the skin over the anteromedial aspect of thigh & knee, medial border of the leg & medial malleolus (via saphenous nerve). Sciatic nerve supplies

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cutaneous innervations to the posterior aspect of the thigh and the entire leg and the foot below the knee, except a thin medial strip (saphenous nerve). As shown in Figure 1.

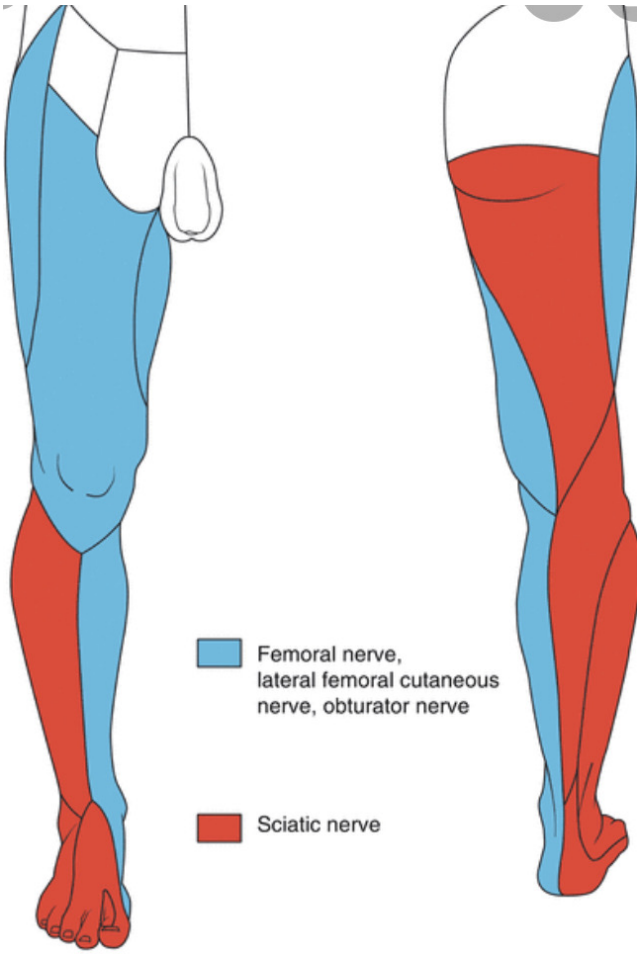

Fig. 1:

4. Goals

To maintain normal sinus rhythm (HR-60-90/min), to maintain intraoperative Hemodynamics are within 5-10% of preop value, to multidisciplinary approach, Restricted fluid administration, to avoid hypoxia, hypercarbia, acidosis and hypothermia, to maintain systemic vascular resistance, to provide adequate intraoperative as well as postoperative analgesia, early diagnosis & treatment of arrhythmias, Premedication may alleviate a patient's anxiety & help to prevent perioperative tachycardia, drugs causing negative inotropic or vasodilatory effect should be avoided and any drug that could cause tachycardia should be avoided.

5. Pre-operative preparation

Written informed consent was taken, High risk consent was taken, Confirmed NBM status was confirmed, IV access was secured, Site & side of the surgery was confirmed. Emergency resuscitation drugs, equipments & defibrillator kept ready, difficult airway trolly kept ready, multipara monitors (pulse oximetry, non invasive BP monitoring, ECG, temperature) attached, warming blankets kept ready.

5.1. Sciatic nerve block- (L4-L5, S1-S3)

The patient was positioned laterally with pillow between the two legs and operative leg up. Under all aseptic precautions the sciatic nerve was identified with low frequency curvilinear probe on the USG on subgluteal approach, the sciatic nerve was triangular, thick, hyperechoic structure in between the two bony prominences, Greater trochanter & Ischial tuberosity as shown in Figure 2. Gluteus maximus muscle is above the sciatic nerve, Quadratus femoris muscle is below the sciatic nerve, 22 G 100cm stimuplex needle was used, with in plane i.e lateral to medial approach. The target response achieved was planter flexion and inversion of foot at 0.5 mA current on PNS due to stimulation of tibial nerve component of sciatic nerve. Inj.Ropivacaine 0.5% 20 ml & Inj.Fentanyl 20mcg was injected after negative aspiration for blood.[2]

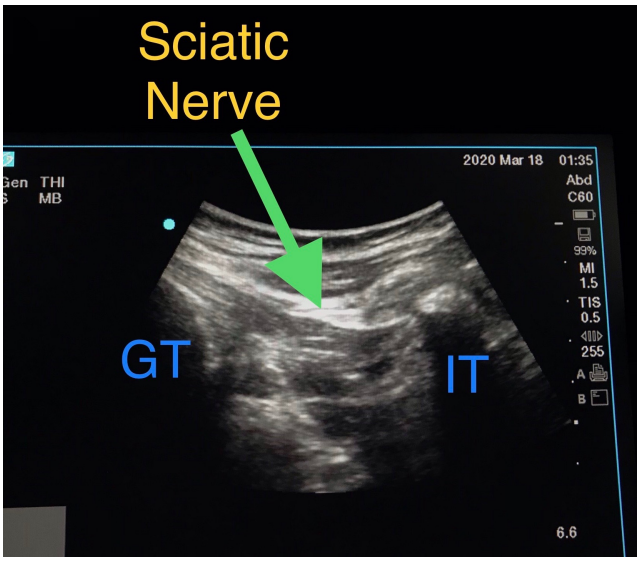

Fig. 2:

5.2. Femoral Nerve Block-(L2-L4)

The patient was positioned supine with right lower limb slightly abducted & externally rotated. Under all aseptic precautions a high frequency linear USG transducer was placed over the area of inguinal crease. Femoral vein & femoral artery are visualised with overlying fascia iliaca. Just lateral to the artery & deep to the fascia iliaca the femoral nerve was identified as a triangular hyperechoic zone between two layers of fascia iliaca as shown in

Figure 3. With a 22G Stimuplex 50cm needle, Clear quadriceps twitch i.e patellar dance was elicited at a current 0.5 mA on PNS.-Inj.Ropivacaine 0.5% 20 ml & Inj.Fentanyl 10mcg were injected after negative aspiration for blood.

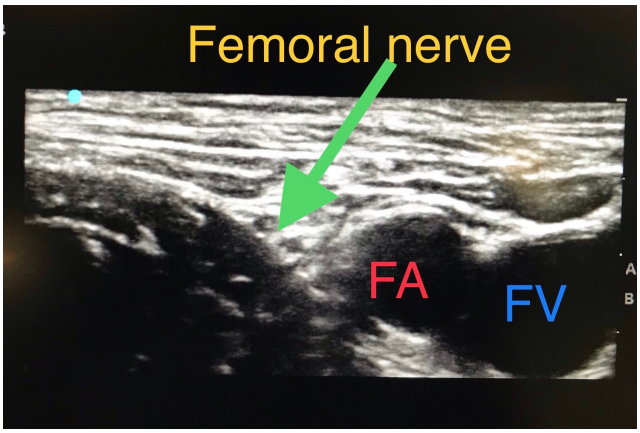

Fig. 3:

After 20 minutes of giving the block, surgical anaesthesia was achieved. Intraoperatively vitals monitoring was done (HR, BP, SPO2, ECG, temperature) & restricted fluid administered. Surgery lasted for 1hr 20 minutes. Blood loss was 200 ml, replaced with equal amount of colloid. Surgery was uneventful. Complete sensory duration i.e duration from injection of drug to pin prick sensation in the area of nerve distribution was 8 hrs, Motor block duration i.e duration from injection of drug till bromage scale 3 was 5 hrs. Postoperative Analgesia i.e duration of injection of drug till the first rescue analgesia was present up to 12 hrs of block.

6. Postoperative Course

Patient was hemodynamically stable in postoperative period. We referred the patient to cardiologist for further management. The cardiologist advised aortic valve replacement & we counselled patient for aortic valve replacement.

7. Discussion

Aortic valve serves a critical function in the heart by maintaining the anterograde flow of blood to the aorta when opened, and preventing retrograde flow into the left ventricle when closed. Resistance to flow by the aortic valve in aortic stenosis imposes a pressure overload on the left ventricle. In response, left ventricle generates progressively higher pressure as stenosis worsens with the development of an aortic transvalvular gradient.[3] This is compensated by chronic pressure overload. The thickness of the left ventricular wall increases so that ratio of pressure to thickness remain constant. The cost of these compensatory mechanisms include, reduced left ventricular compliance, increased myocardial oxygen demand, decreased coronary artery blood flow and eventually left ventricular systolic dysfunction.

Aortic Stenosis occurs as a congenital lesion but more commonly as a aquired disease. Two factors are associated with development of aortic stenosis.

Degeneration and calcification of leaflets and subsequent stenosis. This is a process of aging. Presence of bicuspid rather than tricuspid aortic valve.

Calcification of AV leaflets can result in incomplete closure of valve with associated insufficiency. Obstruction to the ejection of the blood into the aorta due to decrease in the aortic valve area necessitates an increase in left ventricular pressure to maintain forward stroke volume. Normal aortic valve area is 2.5-3.5 cmsq. Transvalvular pressure gradients higher than 50 mmhg and an aortic valve area less than 0.8cmsq characterize severe aortic stenosis. Aortic stenosis always almost associated with some degree of aortic regurgitation.[4]

The normal aortic valve area is 2.6-3.5 cm sq. in adult (Mild Aortic Stenosis more than 1.5 cm sq., moderate Aortic Stenosis is 1.0-1.5 cm sq., severe Aortic Stenosis less than 1.0 cm sq.) & severity of Aortic Stenosis also measured by peak gradient (normal- less than10 mmhg, mild Aortic Stenosis is less than 40mmhg, moderate Aortic Stenosis 40-65 mmhg, severe Aortic Stenosis more than 65 mmhg). Hemodynamically significant obstruction occurs as the aortic valve area approaches 1.0 cm sq. The left ventricle initially responds to the increasing obstruction by hypertrophy. The hypertrophied ventricle becomes increasingly stiff, causing diastolic dysfunction with a reduced compliance. Left ventricular oxygen requirement increases because of increase muscle mass and increase left ventricular systolic pressure.

Angina pectoris may accur in patients with aortic stenosis despite the absence of coronary disease. This is due to an increase in myocardial oxygen requirements because of concentric left ventricular hypertrophy and increase in the myocardial work necessary to offset the afterload produced by the stenotic valve.

In the patient with aortic stenosis, the atrial kick may contribute to 40% of total cardiac output instead of the usual 20%, of left ventricular end –diastolic volume. Preservation of sinus rhythm becomes vital for the maintainance of cardiac output. Therefore to treat possible arrhythmias, external cardioversion pad should be kept ready, preferably before induction of anaesthesia.[3]

Severe aortic stenosis with severe pulmonary hypertension presents high risk for central neuraxial block or general anaesthesia.[1] Any hypoxia, hypercarbia, acidosis, tachycardia can worsen the pulmonary hypertension & ischaemia.Most commonly used anaesthetic technique for lower limb procedure is central neuraxial

block, however its use is limited in compromised cardiac status due to frequent hypotension caused by sympathetic blockade.[4] This patient needed emergency lower limb surgery and had a severe fixed cardiac output condition. Hence considering the risk for central neuroxial block, sciatico femoral block for lower limb anaesthesia was planned.

Degenerative calcific aortic stenosis is the most common form of aortic stenosis in older age population. Perioperative morbidity & mortality is increases in aortic stenosis. Aim is to maintain hemodynamics between 5-10% of preoperative values and to prevent sympathetic response developed during general anesthesia which further worsen the Aortic Stenosis. Central neuraxial blockade is contraindicated in patient with low fixed CO state because hypotension and bradycardia following central neuraxial block further worsening the condition.

8. Conclusion

Peripheral nerve block is the best option for anaesthesia as well as analgesia in a patient with severe AS. For emergency LL surgery, where central neuraxial block is contraindicated. Sciatico femoral block is a good option with intraoperative anaesthesia as well as analgesia and good postoperative analgesia.

9. Source of Funding

None.

10. Conflict of Interest

None.

References

1. Christ M, Sharkova Y, Geldner G, Maisch B, et al. Preoperative and Perioperative Care for Patients With Suspected or Established Aortic Stenosis Facing Noncardiac Surgery. *Chest*. 2005;128(4):2944–53. doi:10.1378/chest.128.4.2944.
2. Ota J, Sakura S, Hara K, Saito Y. Ultrasound-Guided Anterior Approach to Sciatic Nerve Block: A Comparison with the Posterior Approach. *Anesth Analg*. 2009;108(2):660–5. doi:10.1213/ane.0b013e31818fc252.
3. Torsher LC, Shub C, Rettke SR, Brown DL. Risk of Patients With Severe Aortic Stenosis Undergoing Noncardiac Surgery. *Am J Cardiol*. 1998;81(4):448–52. doi:10.1016/s0002-9149(97)00926-0.
4. Hines RL, Marschall KE. Stoelting's anesthesia and co-existing disease. 6th ed. Philadelphia, USA: Elsevier; 2012.

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