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CASE REPORT

UNILATERAL SPINAL ANAESTHESIA (UNLSPA) IN HIGH RISK PATIENT (HYPERTENSION + ASD) POSTED FOR ORTHOPEDIC SURGERY: A CASE REPORT

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ABSTRACT: The term unilateral spinal anaesthesia is used when block is off operating side only and the operative side will be dependent side and absence of block on non-operative i. e. nondependent side. So when surgery involving in one limb, especially below knee surgery such block is very advantageous as it minimizes cardiovascular effects, avoids motor block of non-operative limb and facilitates early discharge. For this purpose we used 1.2ml of (6mg) of hyper baric Bupivacaine 0.5%+0.2ml (10microgram) of fentanyl to produce exclusively unilateral spinal anaesthesia. **CASE REPORT:** A 62 years old obese patient (80Kgs), 5 feet 10 inch height patient with known history of hypertension and diabetes mellitus posted for below knee orthopedic surgery (Bimalleolar Screws + Fibular plating). This patients 2D Echo showed chance finding of atrial septal defect (ASD) of ostium secundum type with 26mm in size and asymptomatic with left to right shunt. Ejection fraction is 48%. **CONCLUSION:** In this case we used 0.5% Bupivacaine 1.2ml (6mg) and 0.2ml of fentanyl (10microgram) which has provided predominantly unilateral block. 15-20 minutes taken to keep the patient in lateral decubitus position to establish the block completely. The advantages are hemodynamic stability, patient satisfaction and faster anaesthesia recovery.

KEYWORDS: Unilateral spinal anaesthesia, hyperbaric Bupivacaine, Hypertension, ASD, Below Knee surgery.

INTRODUCTION: Unilateral spinal anaesthesia may be advantageous in high risk lower limb surgery patient. Low anaesthetic dose, slow injection rate and lateral position have been reported in helping this technique.

Since achieving of Unilateral spinal anaesthesia in 1947 so many cases of lower limb orthopedic and vascular, perianal, varicose veins surgeries were done in high risk patients (Mallampati Grade-III & IV) with ULspa because limiting the spread of spinal block offers many clinical advantages like cardiovascular stability is higher, patients acceptance is more, Rapid patient discharge can be done with early nursing management. More over many studies,[1] have proved that cardiac index values are much more stable in unilateral spinal anaesthesia than in bilateral conventional spinal anaesthesia. There will be only small decrease in arterial blood pressure and heart rate. The fall in blood pressure will be very less with clinical relevance (5% vs. 20% in conventional SA).

Apart from the above advantages patient acceptance and early nursing management with early ambulation are positives for the patient as lack of motor block paralysis in non-operative side aid in nursing management, as the patient can assist with unblocked limb and maintained spontaneous micturition. Earlier ambulation because of lack of unpleasant experience of sudden reversible paraplegia that occurs with conventional bilateral spinal anaesthesia.

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In ULspa it is a reversible monoplegia of operative leg. Unilateral spinal anaesthesia can be indicated to all high risk patients with lower limb orthopedic, Vascular and general surgeries.

CASE REPORT: A 62 years old male with fracture malleoli and fracture fibula posted for surgery (Malleolar screws + plating of fibula).

On examination he is obese, 80Kgs with 5 feet 10 inch tall. On taking history is a known hypertensive on treatment for last 5 years and is known diabetes on treatment since last three months. Both were under control. He is found having atrial septal defect (ASD) of ostium secundum type with R-L shunt, on 2D Echo with mild PAH which is a chance finding on 2D Echo with ejection fraction of 48%, No wall motion abnormality. Otherwise the patient is asymptomatic all these years is placed in mallampati grade-III.

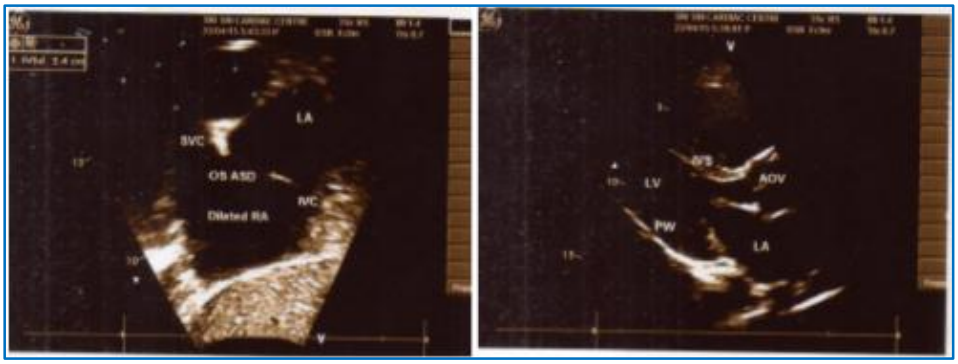

Fig. 1: 2D Echo of the Patient with 28mm of ASD

All the baseline investigations are normal with blood pressure 140/90mmHg and pulse rate-84/minute. He is administered bacterial endocarditis prophylaxis; Injection Rantac. 50mg+Inj. Metaclopramide were given as antiemetic prophylaxis. Informed consent was taken in view of ASD, Hypertension, Diabetic mellitus, obesity and old age and planned for unilateral spinal anaesthesia.

NIBP, pulse oxymeter, ECG monitoring were instituted.

The patient was put in a lateral decubitus (operative side on dependent side) for unilateral spinal anaesthesia. With 25 gauge spinal needle in L4/5 space after clear CSF 0.5% of 1.2ml of Bupivacaine+0.2ml Fentanyl in combination was given intrathecally.

After waiting for 15-20 minutes the patient was put in supine position. The patient asks to move the dependent and nondependent limbs. He was unable to move the dependent limb (Motor Paralysis) but was able to move the nondependent one easily. The Bromage was checked. On Bormage scale the dependent limb was grade-III and the nondependent one it was almost 0.

Score	Bromage scale
0	The patient is able to move the hip , knee and ankle
1	Patient is unable to move the hip but is able to move the knee and ankle
2	Patient is unable to move the hip and knee but is able to move the ankle
3	Patient is unable to move the hip knee and ankle

Table 1

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The patient was stable during intra operative period; Surgery was done in 30-40 minutes, Fentanyl taken care of post-operative pain. The post-operative period was uneventful. The patient was discharged on day-3.

DISCUSSION: When attempting unilateral spinal anaesthesia we should consider various factors. These are 1) Dose of local anaesthetic solution. 2) Speed of injection. 3) Patient position during spinal anaesthesia. 4) Spinal needle opening position (injected through directional, pencil point needles).

Many studies have proved small doses of hyperbaric local anaesthetic solution (0.5% <1.5ml of Bupivacaine in below knee surgeries) avoids migration of motor paralysis towards nondependent side when patient was kept 10-15 minutes in lateral decubitus position. The speed of injection should be slow where the flow is converted from laminar to turbulent at 0.1ml/second,[2] so the speed should be 1cm,[3] every 20-30seconds with bevel of the needle toward the surgical site (Near to the nerve roots) so this also avoids the migration of the motor paralysis and sympathetic blockade bilateral. As it is hyperbaric Bupivacaine the difference in density and local anaesthetic and CSF enable the nerve roots of treated site to be affected selectively with patient turned in lateral position.

Attempting unilateral block results in four fold reduction in the incidence of clinically relevant hypotension with more stable hemodynamic parameters as compare to a conventional spinal block. Unilateral spinal anaesthesia helps in minimal delaying patient preparation time, higher patient acceptance, increased autonomy after surgery (Because there will be no reversible paraplegia. Patient can move one limb).

The most common side effect of conventional spinal anaesthesia is hypotension and bradycardia occurring between 15%-30% with a particular increased incidence in hypertensive patients which may lead to myocardial or cerebral ischemia,[3,4,1,2] based on reports history of hypertension increases the risk of development of hypotension by nearly two fold.[5]

In hypertensive patients medial hyperplasia and hypertrophy of arteries and arterioles increases vasodilatory capacity leading to a loss of central redistribution of the blood volume. The auto regulation of cerebral blood flow is at higher side than normal in hypertensive patients. This makes them more susceptible to hypotension which leads to cerebral ischemia at higher level of blood pressure than normotensive patients who undergo conventional spinal anaesthesia.[6]

Hypertensive patients can develop wide swings of blood pressure intra operatively with increased post-operative cardiovascular and renal complications.

Since the beginning of 20th century various techniques so spinal anaesthesia aimed at restricting the spread of somatic and sympathetic block have been documented. The use of localized spinal anaesthesia was described as early as 1909 by Jonneso.[7]

Unilateral spinal anaesthesia was first achieved in 1947 and today it is fully recognized, safe and practical method to execute in very high risk patients undergoing lower limb surgeries.

The cardiovascular protection and hemodynamic stability it offers compare to conventional bilateral spinal anaesthesia has been described by many studies.[1,8,]

In this case we adopted unilateral spinal anaesthesia using a very low dose of 1.2ml of hyperbaric Bupivacaine with 0.2ml of Fentanyl and observed that the fall in blood pressure is not clinically relevant so as to cause any compactions to the patient since ASD was a chance finding and no reported documents are available, and the patient is asymptomatic not effected by ASD even at 62 years, we considered it normal and proceeded with unilateral spinal anaesthesia uneventfully.

Studies have proved that using hyperbaric Bupivacaine 0.5% more than 2ml i.e. 10mg for ULspa in above knee operations, there will be migration of the motor block to the opposite side also even after 30-60minutes of ULspa.

Whereas using 1.5ml or <1.5ml hyperbaric Bupivacaine can be very effective in below knee surgeries.

CONCLUSION: So using unilateral spinal anaesthesia which is of simple technical skill we can reliably provide a preferential anaesthetic distribution of spinal block to the operative site with minimal doses of local anaesthetic and the hemodynamic stability justifies this choice of anaesthesia in hypertensive and high risk patient undergoing lower limb surgeries.

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