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Original research article: Study of usefulness of sciatic block and 3 in 1 block for lower limb surgeries contraindicated to spinal anesthesia

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Abstract
Background: The posterior approach to sciatic nerve block has wide clinical applicability for surgery and pain management of the lower extremity. Consequently, a sciatic block is one of the more commonly used techniques in our practice. In contrast to a common belief, this block is relatively easy to perform and associated with a high success rate. It is particularly well-suited for surgery on the knee, calf, Achilles tendon, ankle, and foot. It provides complete anesthesia of the leg below the knee with the exception of the medial strip of skin, which is innervated by the saphenous nerve. When combined with a femoral nerve or lumbar plexus block, anesthesia of the entire lower extremity can be achieved
Aims: To Study usefulness of Sciatic Block and 3 in 1 Block for lower limb surgeries contraindicated to spinal Anesthesia.
Material and Method: This procedure was evaluated in 30 patients (ASA I to IV) undergoing elective and or emergent orthopedic surgeries in our hospital.
Results: All 30 patients were given sciatic nerve block through classic posterior approach and 3 in 1 block through inguinal perivascular approach with success rate of 90%.
Conclusion: This technique could avoid centroneurexis block in haemodymic unstable patients. This is safe simple and effective alternative to spinal anesthesia for power limb surgeries especially in patients with poly trauma.

Keywords: Perivascular Approach, Anesthetic technique. Sciatic nerve Block, Posterior Approach Lumber plexus block 3in 1 Block

1. Introduction

The sciatic nerve supplies motor and sensory innervation to the posterior aspect of the thigh as well as the entire lower leg, except for the medial leg, which is supplied by the saphenous nerve (the terminal branch of the femoral nerve). The sciatic nerve, formed from the anterior rami of spinal nerves L4–S3, is the largest nerve in the body. Because the sciatic nerve is so large, it can be blocked from several different locations along the lower extremity. Labat's sciatic nerve block is the classic approach, targeting the nerve in the gluteal region. Other sciatic nerve blocks include the anterior and lateral approaches, which allow the patient to remain in the supine position, as well as the parasacral and prone approaches. Raj's subgluteal approach is performed in the supine position with the hip flexed. Sciatic nerve blocks require adequate set-up because this large nerve resists local anesthetic penetration, leading to longer block onset times. For complete anesthesia of the leg below the knee the saphenous nerve must also be blocked, either directly or via a femoral nerve block [1].

Lower limb blocks are less popular because epidural and subarachnoid injection provide rapid, complete and safe anesthesia of the lower limb. And technically simple. Sciatic and 3 in 1 Block are easily accomplished with minimum side effect and avoid sympathectomy associated with spinal Anesthesia [2].

Nerve supply of lower limb is derived from lumber (Femoral, Obturator and Lateral Cutaneous Nerve of thigh) and sacral (Posterior cutaneous nerve of thigh and sciatic) Plexuses. Inguinal perivascular technique of lumber plexuses block described by Winnie, utilizes the facial envelop around the femoral nerve as a conduct which carries injected anesthetics superiorly to the level where lumber plexuses forms. While classic posterior approach to the sciatic nerve block describe by Labat also block posterior cutaneous nerve of thigh [3, 4].

2. Material and Method

This study includes 40 patients of either sex aged between 18 to 60 years belonging to ASA Grade I to IV undergoing elective and or emergency orthopedic surgeries of our hospital.

Exclusion criteria: Those patients who could not positioned themselves for sciatic block e.g. Facture femur head, Hip were excluded from this study.

The procedure was properly explained to the patients and after taking informed consent the patients were premedicated with injection Glycolpyrolate IM 45 mints before the procedure.

In Operation Theater, the line was secured and the block was carried out with full aseptic precaution.

Technique for the Sciatic Nerve Block

Patients were kept lying on the opposite side of Block, Rolled forward with flexed knee with heel on the oppossion to the knee of outstretch dependent leg. A line was drawn to connect posterior superior iliac spine to the greater trochanter of the Femur. A second line was drawn on of right angle from its midpoint downward 3 cm and it represent the point of injection

second verification of this point was made by projecting line from greater troachanter to the sacral hiatus. The intersection of this line with the perpendicular also indicated the point of needle entry and would fall 3 to 5 cm along the line. 22 Gauge 10 to 12 cm long needle was advanced until a parasthesia was elicited on bone was contacted.

If the bone was contacted then needle was retracted systematically in lateral or medially. Once the needle was properly placed 20 ml inj Lignocaine HCL with Adrenaline 1 into 200 000 was injected.

Technique of Perivascular approach to lumber plexus block (3 in 1)

The patients were lying in supine position. The femoral artery was marked where it emerges the distal to the inguinal ligament. A short bevel 22 gauge 5 cm Needle was advanced lateral to the artery in a cephalic direction until perasthesia was obtained. The needle was held immobile while distal pressure was applied digitally to the femoral sheath. Total 30 ml of Lignocain HCL with Adrenaline 1in200 000 was injected after negative aspiration. 2

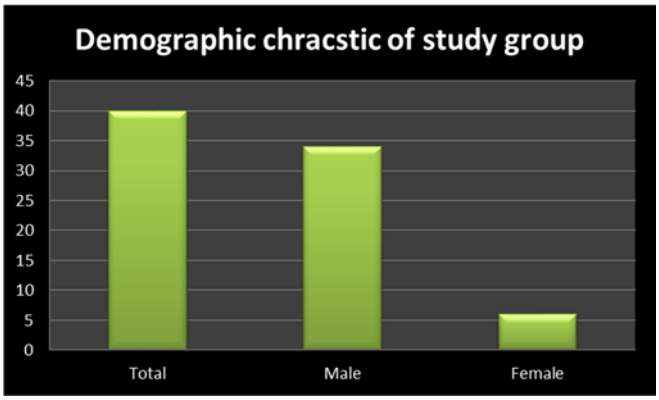
Vital Para meters were monitored initially every 2 mints up to 15 mints. Sedation in form of injection Pentazocine 0.3 to 0.5 mg per kg and Inj Diazepam .0.1 mg per kg was given after establishment of complete block.

Post operatively the duration of analgesia was note and patients were observed for any side effect up to 8 hrs.

3. Results

Table 1: Demographic characteristic of the participants

Total participants(n)	Age group(yr)	Male(n)	Female(n)
40	18-60 yr	34	6



Graph 1: Graphical presentation of Demographic characteristic of the participants

Out of 40 patients 34 were males and Rest were 6 female. (Table 1)

About 94% blocks were successful with meantime of onset 8.4 +3.2 minutes.

Mean duration of analgesia with Lignocain HCL with Adrenaline 1 to 200 000 was 240 + 42 minutes.

37 cases were having relative contraindication of spinal anesthesia. The condition that relatively contraindicated to spinal anesthesia were hypovolumic shock Head injury and previous neurological deficiet. ect. Intraoperativly 2 of 30 patients needed additional general anesthesia as they did not tolerate the Esmarch Cuff.

One patient develops slurring of speech and perioral numbness due to local anesthetic toxicity. Patient was carefully observed respiratory depression.

It is concluded that this technique is very safe, effective economical and can be mastered with little practice and useful alternative to spinal anesthesia for lower limb surgeries. However one should be careful while using it in patients having gross hepatic or renal disorder for fear of accumulation of up to toxic doses.

4. Discussion

While femoral and sciatic blocks have been used effectively to provide anesthesia for operations on the lower leg and foot, block anesthesia for procedures on or above the knee has not been used extensively because of the necessity to also block the obturator and lateral femoral cutaneous nerves. Even in experienced hands, if blockade of all four nerves is attempted, it requires a large number of injections and large volumes of local anesthetic; thus, not only may the failure rate be high but the complication rate as well [5]. A re-examination of the anatomy would seem to indicate that the three nerves to the leg arising from the lumbar plexus can be blocked by a single injection, for the lumbar plexus arises in a fascial envelope, from which an extension accompanies the femoral nerve [6]. Thus, if this fascial extension is identified by the production of a paresthesia of the femoral nerve and if a sufficient volume of anesthetic solution is injected to reach the plexus, anesthesia of all three nerves does result. Clinical experience has shown such a technic to be extremely effective, safe, and simple; and volume-anesthesia studies have indicated that to block all three nerves consistently a minimum of 20 ml. of anesthetic must be utilized. On the other hand, additional studies showed that even with the use of volumes two or three times this minimum volume, anesthesia over the distribution of the sciatic nerve did not result; this nerve had to be blocked separately if anesthesia in that distribution was necessary [7, 8].

5. Conclusion

From my study conclusion is that this technique could avoid centroneurexis block in haemodymic unstable patients. This is safe simple and effective alternative to spinal anesthesia for power limb surgeries especially in patients with poly trauma.

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