COMPARATIVE STUDY OF ULTRASOUND GUIDED ANTERIOR AND POSTERIOR APPROACHES TO SCIATIC NERVE BLOCK FOR LOWER LIMB SURGERIUES

By

Dr. BUDATHA.SREENIJA

Dissertation submitted to

B.L.D.E. (DU) UNIVERSITY VIJAYAPUR, KARNATAKA

In partial fulfillment of the requirements for the degree of

DOCTOR OF MEDICINE

IN

ANESTHESIOLOGY

Under the guidance of

Dr. D.G.TALIKOTI

PROFESSOR

DEPARTMENT OF ANESTHESIOLOGY

B.L.D.E.(D.U). SHRI B.M.PATIL MEDICAL COLLEGE

HOSPITAL & RESEARCH CENTRE, VIJAYAPUR

KARNATAKA

2020

COMPARATIVE STUDY OF ULTRASOUND GUIDED ANTERIOR AND POSTERIOR APPROACHES TO SCIATIC NERVE BLOCK FOR LOWER LIMB SURGERIES

DOCTOR OF MEDICINE

IN

ANAESTHESIOLOGY

TABLE OF CONTENTS

List of Figures

List Of Tables

List of Graphs

List of Abbreviation

ASA -AMERICAN SOCIETY OF ANESTHESIOLOGISTS

BMI -BODY MASS INDEX

CPR -CARDIO-PULMONARY RESUSCITATION

CCF -CONGESTIVE CARDIAC FAILURE

CPN -COMMON PERONEAL NERVE

GT -GREATER TROCHANTER

PSIS -POSTERIOR SUPERIOR ILIAC SPINE

SH -SACRAL HIATUS

SN -SCIATIC NERVE

SNB -SCIATIC NERVE BLOCK

TN -TIBIAL NERVE

LA- LOCAL ANESTHETIC

USG- ULTRASOUND GUIDED

LAST- LOCAL ANESTHETIC SYSTEMIC TOXICITY

VAS- VISUAL ANALOG SCALE

ABSTRACT

BACKGROUND:

While the lack of precise surface anatomical markers and technological challenges have made anterior approach to sciatic nerve block rare, an anterior approach to sciatic nerve using ultrasound guidance is feasible.In this study , we compared ultrasound guided anterior approach and posterior approach.

AIM:

The aim of the study was to compare between the anterior approach and posterior approach to sciatic nerve block with regard to patient comfort, technical difficulty and quality of block.

OBJECTIVES:

The objectives were,

- To compare number of attempts.
- Time taken to perform block.
- To compare onset of sensory and motor blockade.

- To compare the duration of analgesia.

- Quality of the block and success rate of the procedure.

Materials and Methods:

Twenty-four patients were enrolled in this prospective double-blind randomized study and were randomly divided into two equal groups: Anterior (Group A) and posterior (Group P). We evaluated the following parameters: time taken to perform block, onset time to block, duration of analgesia and overall patient satisfaction.

Results:

The posterior approach is simpler to carry out than the anterior approach and requires less time, while also providing better patient comfort and satisfaction. In terms of demographic data, onset time of block, and patient's satisfaction, there was no significant variations among patient groups.

Conclusion:

In midst of the fact that both approaches of block to the sciatic nerve are equally effective, our investigation has led us to the conclusion that the posterior approach

is simpler to carry out than the anterior approach and requires less time, while also providing better patient comfort and satisfaction. The advantages of ultrasound-guided posterior sciatic nerve block include effective anaesthetic and great patient satisfaction.

Keywords: *Anterior approach,Posterior approach, knee surgery, transgluteal, ultrasound-guided sciatic nerve block*

INTRODUCTION:

Regional anesthesia is a common and widely used method for lower limb procedures.A common technique used in regional anaesthesia, the sciatic nerve block can be performed alone or in conjunction with femoral nerve blocks.[1, 2.] . Because they provide the post-operative analgesia with fewer hemodynamic and metabolic complications than general anaesthesia, peripheral nerve blocks have become more common in the management of diabetic patients.[3] Patients with cardiovascular illnesses may have complications as a result of coexisting illnesses such as coronary heart disease, autonomic neuropathy, hypertensive, stroke, chronic kidney disease caused by untreated diabetes, and even with central neuroaxial blockade.Therefore, a sciatic nerve block is a safer option, whether it is combined with or without a saphenous or femoral nerve block.[1, 4] In 1974, Winni made changes to Labat's traditional posterior sciatic nerve block technique. [5] However, this method calls for repositioning the patient in lateral decubitus, which might be difficult or impossible in patients with obesity or limited movement. Additionally, it calls for the recognition of several bone markers, which can occasionally be challenging. The patient typically feels pain and discomfort as the needle is inserted into the various layers of muscles during block placement.

Beck first described the anterior approach back in 1963.[7] The benefit of this method is that the patient can lie supine during the block . Additionally, palpating and locating landmarks are simple. The patient may experience some pain when the needle makes contact with the femur, but this can be mitigated by rotating the leg internally.

The sciatic nerve supplies the majority of motor and sensory function of lower limb .Regional anesthetic blockade of sciatic nerve is given at different anatomic locations like sacral plexus, classical transgluteal approach, Posterior (sub gluteal) approach, anterior approach, popliteal approach it depends on position of the patient .[4]

At the hip or thigh level, anterior approach to the sciatic nerve is deep and challenging to identify. The combination of sciatic and femoral nerve block has been shown in two approaches to be a successful method for both knee and even below knee surgeries. Successful nerve blocks depend on accurate drug administration and needle placement. For the successful regional anesthesia requires knowledge of the sensory distribution of nerves, their surrounding anatomy, potential anatomical variations and superficial landmarks.[8]

Patients having lower extremity procedures are given anesthesia or analgesia when sciatic and femoral nerve blocks are administered simultaneously [9,10]. An anterior or posterior technique might be used to administer a sciatic nerve block. [11] When patients are supine, anterior sciatic nerve blocks are provided simultaneously with femoral nerve blocks at same site. It is not necessary to turn patient to one side. Because the sciatic nerve is deep and behind the femur, an anterior block is deemed to be an advanced nerve block. [12, 13], which makes administering the block more difficult. Although posterior approach is theoretically easier, patients with lower limb injuries must be shifted sideways to maintain the to be operated leg on top, which causes agony until blockade is acquired.The use of ultrasonography to aid with peripheral nerve blocks is becoming more popular. It is extremely beneficial in knee, calf, achilles tendon, ankle as well as foot surgeries. When paired with femoral nerve block, the anterior approach to the sciatic nerve is beneficial because it is carried out with the patient supine. The sciatic nerve runs behind femur and around back of thigh, although anterior approach using surface anatomical landmarks usually regarded as an advanced nerve block technique and associated with technical difficulty. The leg below the knee is totally anaesthetized, with possible exception of medial skin strip, which is innervated by saphenous nerve. A lumbar plexus block or femoral nerve block is necessary to provide anesthesia throughout practically the entire leg.

The success rate of a peripheral nerve block is typically increased when ultrasonography (USG) is combined with conventional procedures [11, 14]. Both femoral nerve blocks and anterior and posterior sciatic nerve blocks have been effectively treated with USG [15]. It has been demonstrated that using a nerve stimulator and USG simultaneously improves quality of anaesthesia and rate of success of block. [16, 17]

In order to provide anaesthesia and analgesia for procedures on the lower limbs and to manage pain after surgery, ultrasound-guided regional nerve blocks have become a common and standard practice.[18] Although there are few accurate surface anatomical markings and the procedure is technically challenging, ultrasonography guidance may make performing the anterior approach to the sciatic nerve block easier.

A new standard in nerve localization is offered by ultrasound guidance in regional anaesthesia, identification and allowing real time imaging of the nerves and real time visualization of needle in peripheral nerve blocks with easily, accurately, precisely and safely.[19] In many surgical procedures and pain management techniques for the lower extremities, trans-gluteal method for blocking sciatic nerve is employed. Due to deeper location of sciatic nerve compared to the posterior route, the anterior approach requires more operator expertise and experience. Use of ultrasound in peripheral nerve blocks may facilitate more rapid block onset [20, 21] and prolong

duration of the block, with the added advantages of a decrease in drug dosage and decrease in incidence of local anesthetic systemic toxicity.[22, 23]

Although numerous methods for ultrasound-guided sciatic nerve blocks have been discussed, none of them are flawless in every aspect. Although there are few reliable surface anatomical landmarks and is technically challenging, ultrasonography guidance may make performing anterior approach to sciatic nerve block easier.

In comparison to posterior techniques, the anterior approach to sciatic nerve block has a number of benefits. With the anterior technique, the patient can be in the same posture for both the femoral and sciatic blocks while the patient is supine, the limb does not need to be extended, and the block can be given.

When using the anterior technique, sciatic nerve is directly behind the femur. The needle is introduced via the antero-medial thigh, inferior to the inguinal ligament, and then progressed posterior to the sciatic nerve. The needle should be reached the sciatic nerve as it travels just medial to the femur. But before the needle reaches the sciatic nerve, it frequently pierces the femur. Even though classic description of the block suggests that, in the event that the needle makes contact with the femur, it should simply be "walked off" the bone, doing this commonly results in needle tip being displaced too medially, keeping it away from the nerve.

In this study we sought to compare two approaches that are often employed i.e. anterior approach and posterior approach for ultrasound guided sciatic nerve block to determine efficacy and patient's satisfaction.

ANATOMY OF SCIATIC NERVE

The sciatic nerve, which originates at base of spine and runs through back of each leg into foot.It is largest and longest nerve in the human body. It is about the breadth of an adult thumb. It is derived from lumbosacral plexus(fig-5). After forming, it exits pelvis and travels through the larger sciatic foramen to the gluteal area. It starts underneath the piriformis muscle and moves down in an inferolateral direction.

Along the posterior surfaces of the inferior gemellus, obturator internus, superior gemellus, and quadratus femoris muscles, the nerve travels through the gluteal region. It enters the posterior thigh(fig-3) compartment deep to the long head of the biceps femoris muscle, superficial to the short head of the biceps femoris muscle and the adductor magnus muscle, as well as laterally to semitendinosus and semimembranosus muscles(fig-1).

The sciatic nerve splits into the tibial and common fibular nerves(fig-4) when it reaches the popliteal fossa.

Motor and sensory fibres from spinal nerves L4 to S3 combine to form the sciatic nerve in the lower spine. These spinal nerves are a part of the lumbosacral plexus, a broader collection of nerves in the lower spine.

In the majority of cases, the nerve separates into the tibial and common peroneal nerves in the upper part of the popliteal fossa, though these nerves can occasionally remain distinct throughout their entire course. The common peroneal nerve travels laterally to innervate a portion of the knee joint and, via its lateral cutaneous branch, to provide sensory innervation to the back and lateral side of the upper calf. In contrast, the tibial nerve continues downward to provide innervation to the distal lower extremity.

Motor functions:

Despite passing through the gluteal region, the sciatic nerve does not innervate any muscles there. However, the adductor magnus and the muscles in the posterior compartment of the thigh are directly innervated by the sciatic nerve.

Through its two terminal branches, the sciatic nerve also indirectly innervates a number of additional muscles:

Tibial Nerve: Some of the intrinsic foot muscles as well as the muscles of the back of the leg (calf muscles).

The other intrinsic foot muscles as well as the lateral and anterior leg muscles are all controlled by the common fibular nerve.

Sensory Functions: There are no direct cutaneous functions of the sciatic nerve(fig-2). It accomplishes via the terminal branches of its sensory innervations.

Tibial Nerve: Provides blood flow to the sole, lateral foot, and posterolateral leg skin.

Common fibular nerve: Skin of the lateral leg and the dorsum of the foot supplied by common fibular nerve.

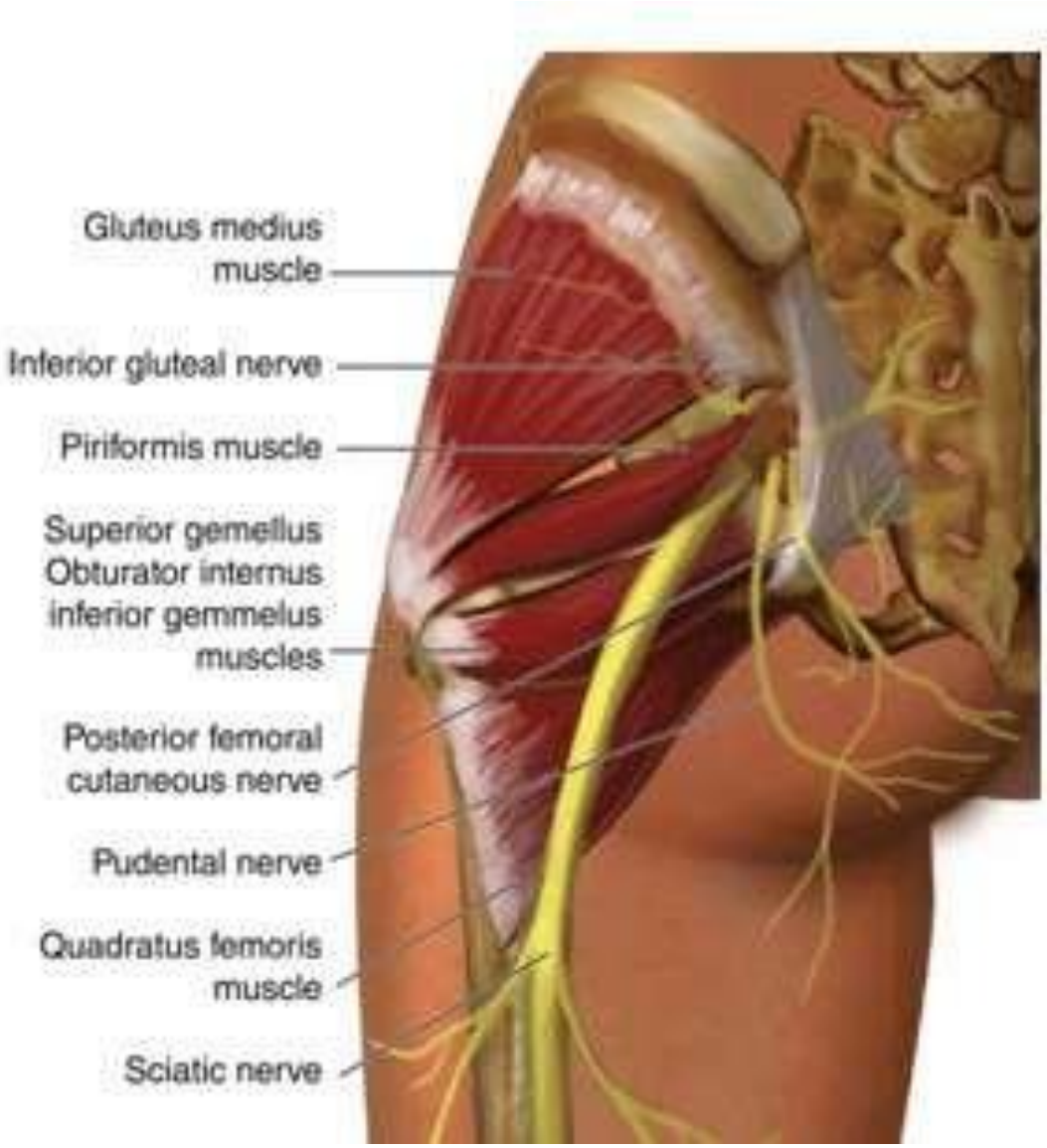


Figure 1: Course of sciatic nerve

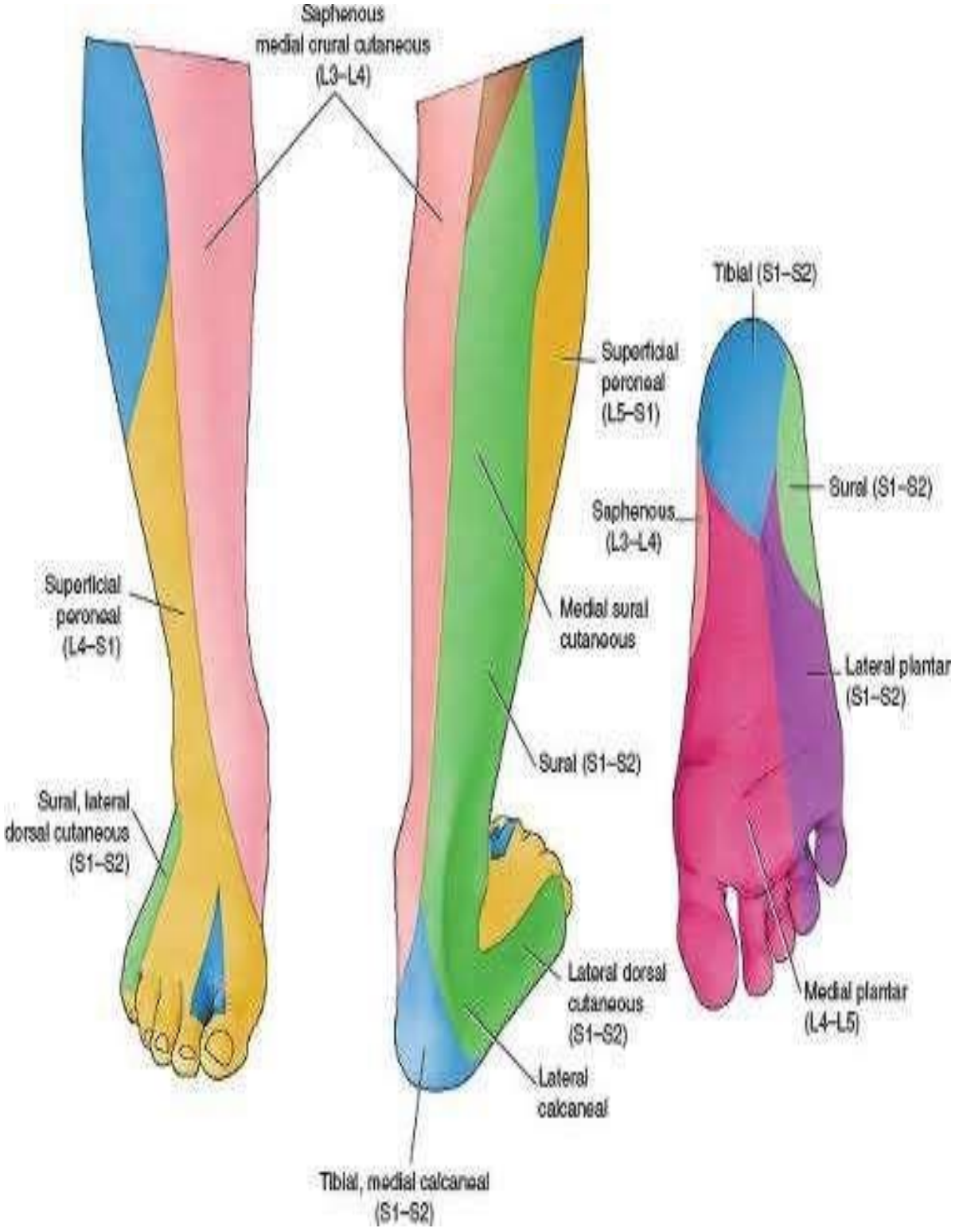


Figure 2: Sciatic Nerve. Cutaneous Innervation

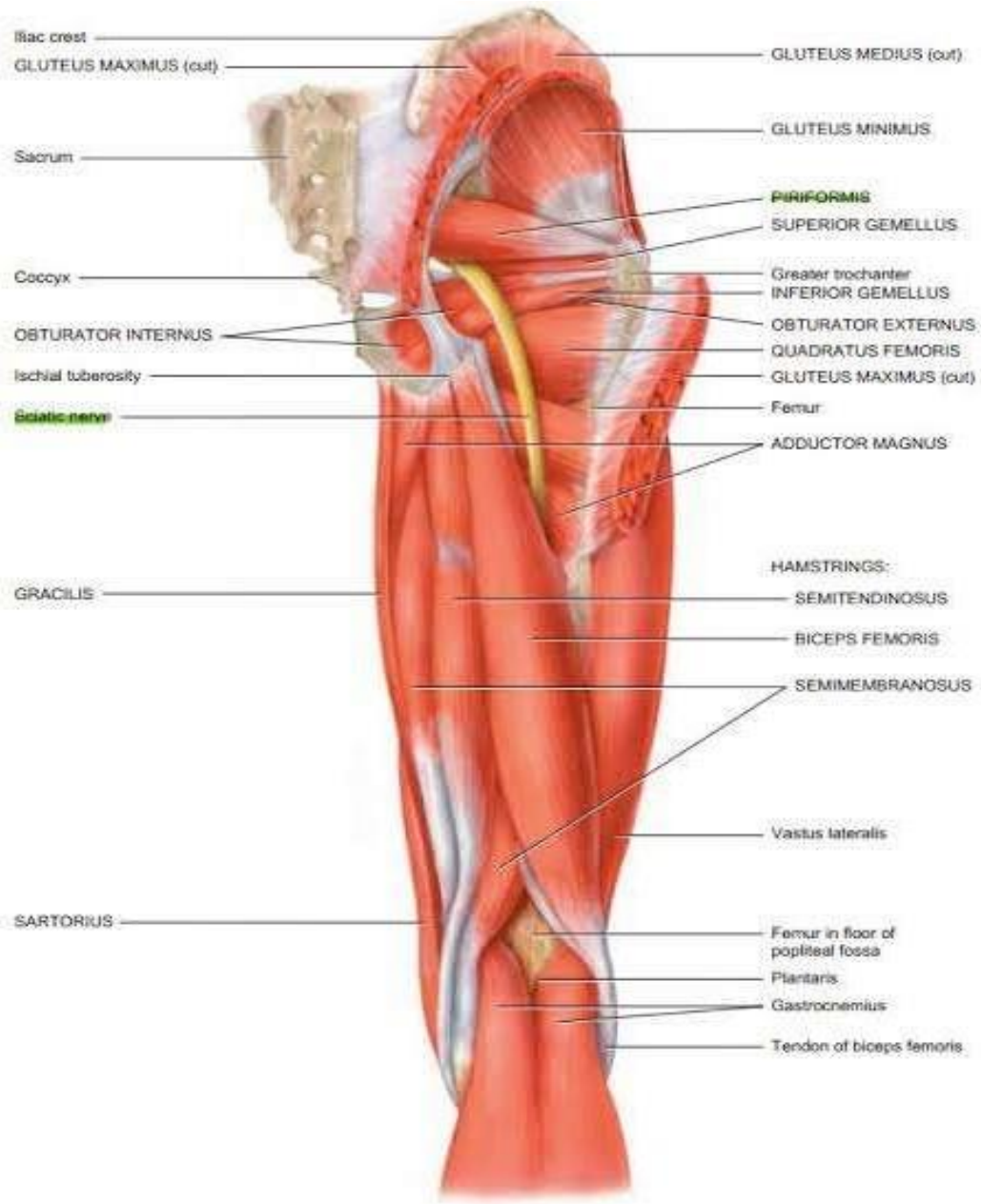


Figure 3 :origin of sciatic nerve

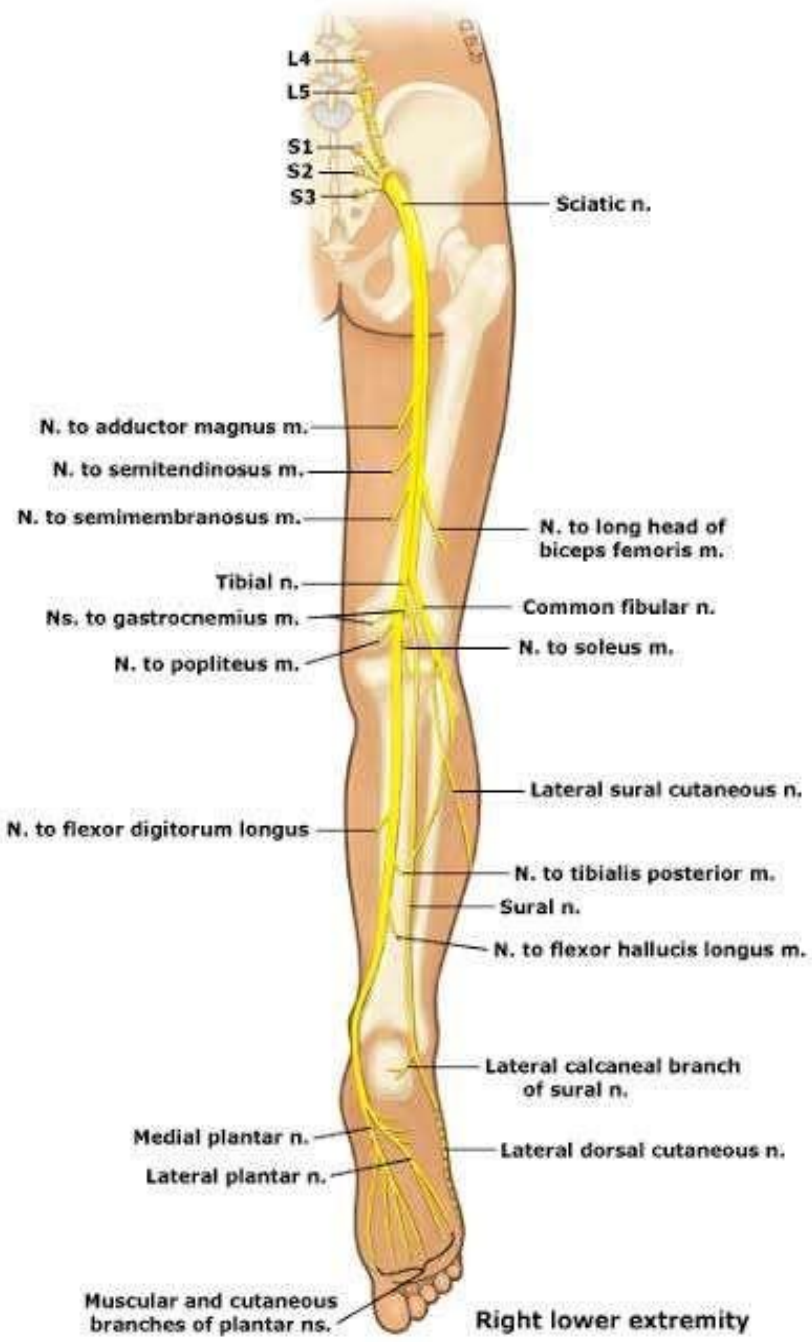


Figure 4: Branches of sciatic nerve

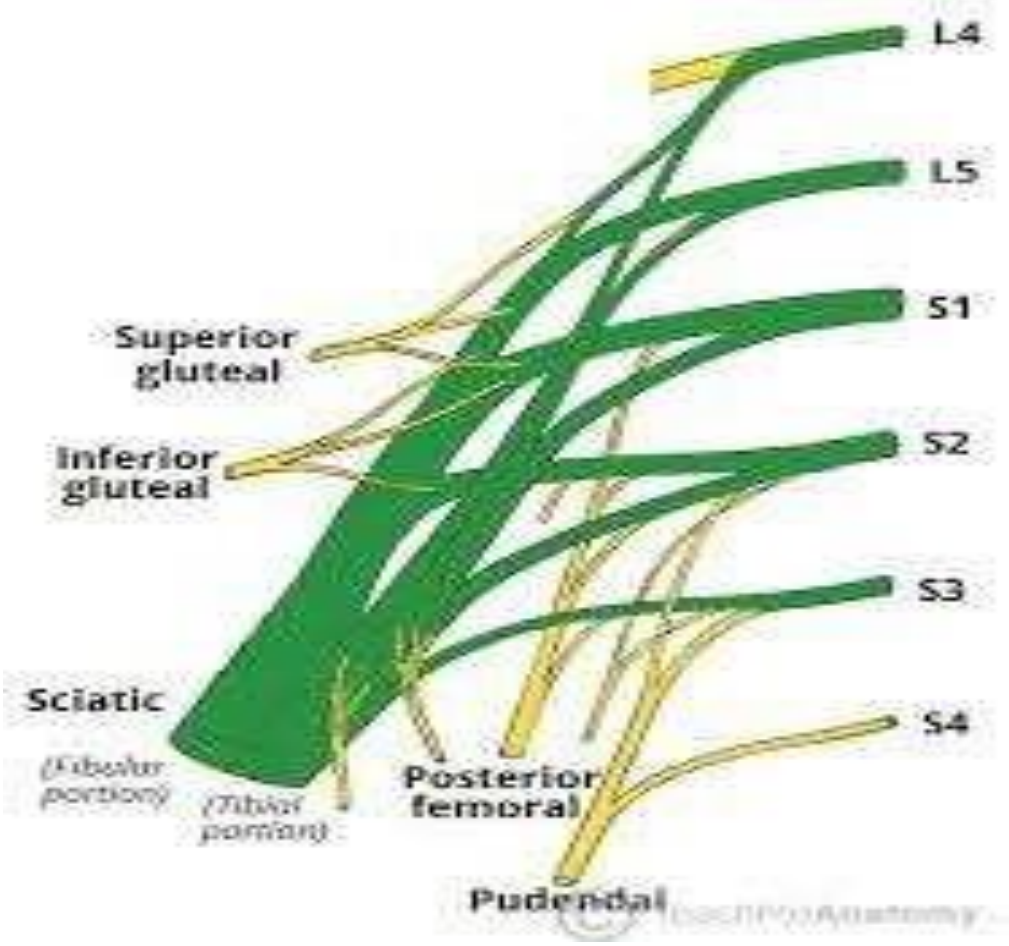


Figure 5: sacral plexus

SCIATICA

Although the precise pathophysiologic causes of sciatica (fig 6) aren't fully understood, spinal nerve root compression is known to be associated with both pain and neurological impairment in a segmental distribution of that particular nerve root. The most common cause is disc herniation or rupture causing impingement of L5 or S1nerve roots. Other causes like spinal stenosis , spondylolisthesis,degenerative changes in disc, non spinal causes such as piriformis syndrome , trauma are also included. [5]

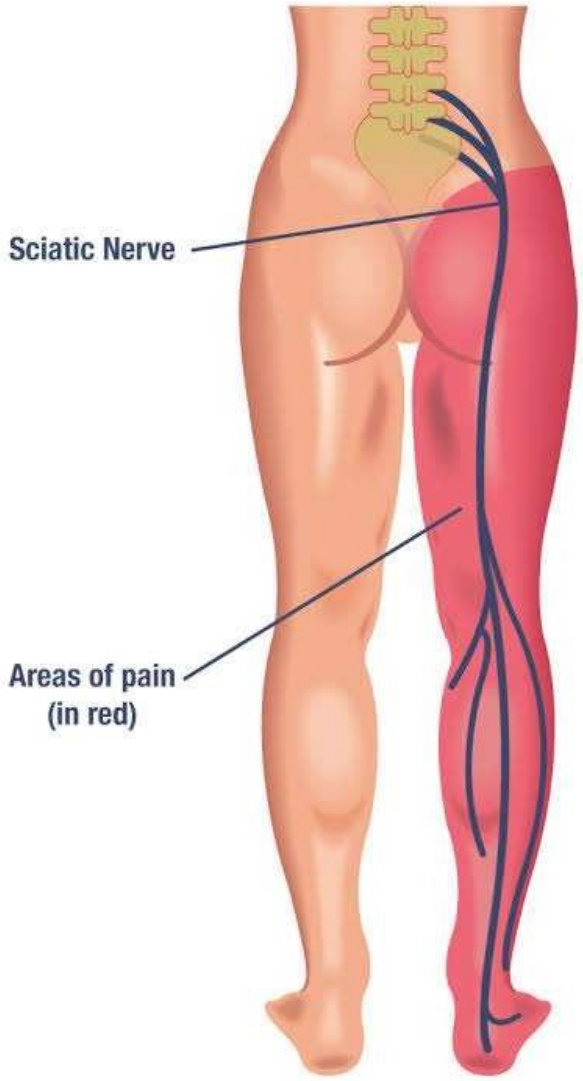


Figure 6 : Area of pain in sciatica

ULTRASOUND IMAGING:

Ultrasound is acoustic (sound) energy in form of waves with a frequency exceeding the human hearing range (i.e 20KHz). Ultrasound is a method of seeing into the human body by using acoustic signals. Ultrasound is a longitudinal mechanical wave in which particle movement is parallel to wave propagation.

PRINCIPLE OF ULTRASOUND:

Piezoelectric principle: An ultrasound probe made of ceramic vibrates a crystal to produce sound waves. At each tissue contact, waves are partially reflected as they pass through the tissue.

The following phenomenon occur as the sound waves move through the body tissues:

-reflection

-refraction

-diffraction

-attenuation

-scattering

The creation, presentation, and storage of an ultrasound image need the following five fundamental parts of an ultrasound scanner:

1. A pulser powers crystals with high-amplitude voltage.

2. Transducer: A device that transforms electrical energy into mechanical energy (ultrasound) vice versa.

3. The receiver finds and amplifies flimsy signals.

4. The display shows ultrasound signals in a number of different settings.

5. Memory, which houses images and video displays.

TYPES OF ULTRASOUND TRANSDUCER

There are three main properties based on which the transducer is selected. They are

1. Frequency

2. Array configuration

3. Foot print - diameter of the probe

Linear probe: (fig7,8)

-High frequency (5-10MHz)

-Straight array

-High resolution

- superficial structures

Curvilinear probe:(fig-7,8)

- Low frequency (2.5- 5MHz)

- Curved array

- Low frequency

- deep stuctures

Transducer(a) Figure-7

Transducer (b) Figure -8

ANTERIOR APPROACH TO SCIATIC NERVE

The advantage of doing the anterior sciatic approach while supine is that it happens at the level of the lesser trochanter. When the patient cannot be positioned laterally, this is especially helpful. The knee is flexed and the thigh is externally rotated. The lesser trochanter of the femur is located using ultrasound imaging. After that, the sciatic nerve is found medially and deeply to this skeletal landmark. Anesthetic outcomes are comparable to subgluteal method.

NERVE STIMULATOR TECHNIQUE

With the patient in supine position, the inguinal ligament is identified between anterosuperior iliac spine and the symphysis pubis and a line drawn along its distribution. Then, this line is split into three equally sized sections. The intersection of a line drawn perpendicular to junction of middle and medial segments is identified.reaches down to thigh.The greater trochanter is identified and a line extended from it medially across the anterior surface of the thigh parallel to the line through the inguinal ligament.After skin preparation and local anesthetic infiltration, a 21-G, 4 to 6 inch insulated needle is inserted at the surface landmark in a slightly lateral direction until the anterior medial surface of the femur is contacted. The needle depth at this point is noted. The needle is then withdrawn to the skin and redirected in a more perpendicular direction to bypass the femur

approximately 5 cm beyond the depth at which the femur was first encountered. Dorsal or plantar flexion of the foot at an mA of less than 0.5 mA confirms successful stimulation, after which20 ml of local anaesthetic is then incrementally injected. The disadvantage of this approach is that it is a technically more difficult block to perform.

ANATOMIC LANDMARK

The following landmarks need to be regularly marked by using a marking pen

1. Femoral crease.
2. Pulsation of femoral artery.
3. A line drawn perpendicular to the femoral crease and going through the pulse of the femoral artery with a needle insertion point 4-5 cm distally.

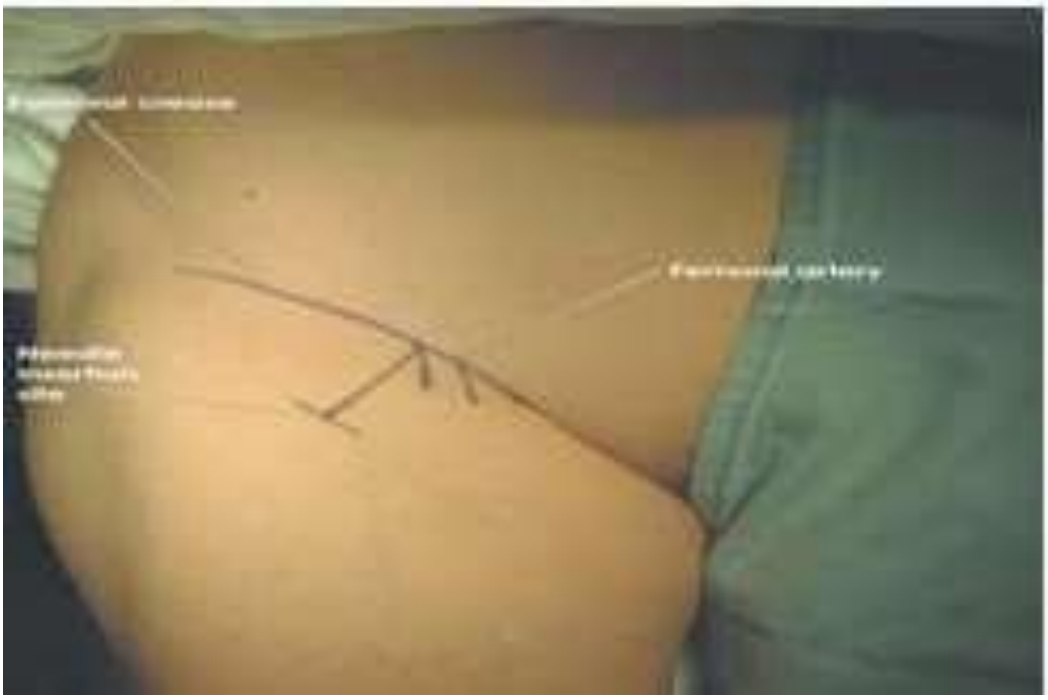


Figure9: Sciatic nerve block through anterior approach

ULTRASOUND GUIDED TECHNIQUE [79]

The anterior approach to sciatic nerve block may be advantageous for patients who cannot be placed in the lateral position because of discomfort, trauma, presence of external fracture fixation that interfere with placement, or other problems. The ultrasound (US)-guided approach may result in a decreased risk of femoral artery puncture than the landmark-based method. The real imaging and needle insertion are performed on anteromedial region of thigh rather than anterior surface of proximal thigh.This may necessitate a minor external rotation and

abduction of the thigh. This block's big needle makes it unsuitable for catheter insertion.

ULTRASOUND ANATOMY

Approximately at the level of the minor trochanter, the sciatic nerve is visualised. When a curvilinear transducer is placed across anteromedial portion of thigh, the muscles of the anterior, medial, and posterior fascial compartments of the thigh may be observed. Femoral artery runs beneath the sartorius muscle, while deep artery of the thigh runs deep and medial to it. Color Doppler US for orientation allows for the identification of both. Femur appears as a hyper-echoic rim with a corresponding shadow under vastus intermedius

.

LANDMARKS AND PATIENT POSITIONING

With the patient lying flat, the anterior approach to the sciatic nerve block is carried out. To make it easier to insert the transducer and the needle, the hip is abducted. To facilitate exposure, the hip and knee should occasionally be slightly bent. To monitor motor responses, the calf and foot must be exposed if nerve stimulation is being performed concurrently, which is advised.

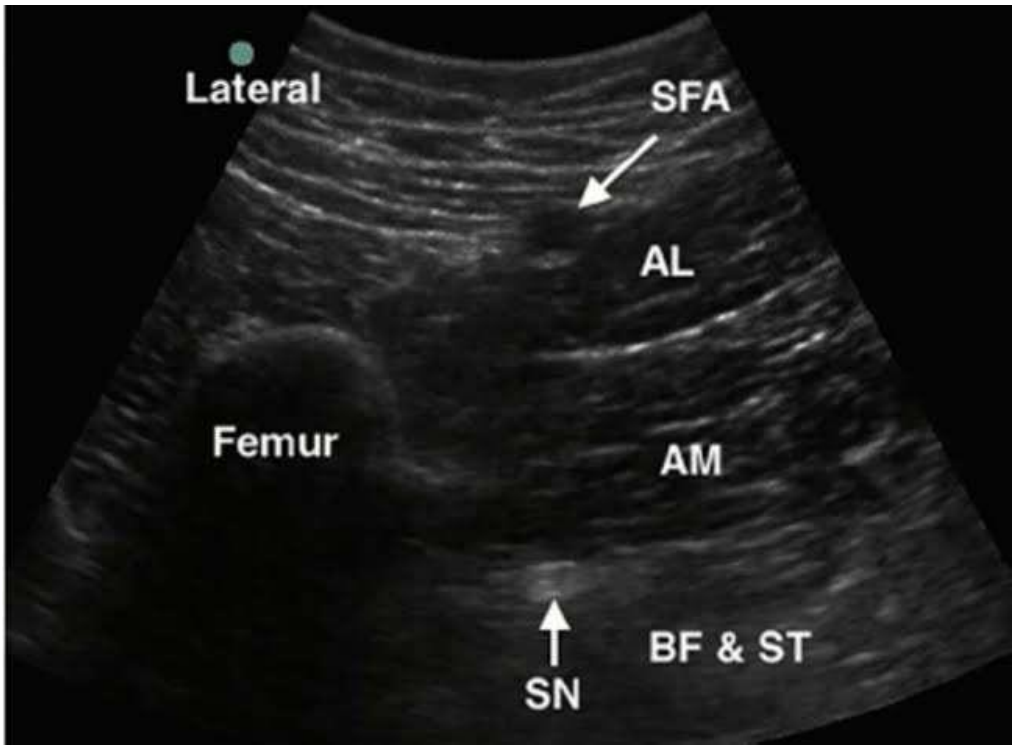


Figure-10: Sciatic nerve block through anterior approach via ultrasound

POSTERIOR APPROACH TO SCIATIC NERVE

From the sacral plexus, the sciatic nerve converges before entering the thigh posterior to the femur and travelling toward the popliteal fossa. It can therefore be stopped at many points throughout its journey. The most popular strategy is Labat's traditional posterior approach as modified by Winnie. However, this method necessitates the recognition of numerous landmarks, and the stimulating needle must travel through numerous layers of muscles, frequently inflicting pain and anguish on the patient during block placement.

NERVE STIMULATOR TECHNIQUE:

The patient is placed in the lateral (Sim's) position, operative site up, thigh maximally flexed, and knee flexed. The femur's greater trochanter is recognised and marked. We locate and designate the posterior superior iliac spine. These two bony features are connected by a line. A perpendicular line is drawn caudally from the line's midway, which is noted. From the sacral hiatus to the trochanter, a line is drawn. The place of insertion is where the line from the hiatus to the trochanter joins the line from the middle of the greater trochanter and the posterior superior iliac spine.. A 21-G, 4 to 6 inch, insulated needle is inserted perpendicular to the skin, searching for movements in the leg and foot. If initial insertion is not successful, the needle is inserted eithercranially or caudally along the line from the trochanter and posterior spine. If intense contractions of the hamstrings occur, the needl has been placed too far medially and should be reintroduced at a point 1 cm more lateral. After successful leg or foot stimulation with an mA less than 0.5, 20 to 25 mL of local anesthetic is incrementally injected.

ANATOMICAL LANDMARKS

In majority of patients, cues for posterior approach to sciatic block are simple to recognize. Due to adipose tissue covering the gluteal area's bony prominences, precise probing technique is crucial. A marking pen is used to outline the landmarks:

-Greater trochanter.

-Posterior superior iliac spine .

-The location of needle's insertion was 4 cm away from the middle of two landmarks.

Figure-11: posterior approach to sciatic nerve block

ULTRASOUND GUIDED TECHNIQUE

For posterior approach, nerve can be visualised even with a linear probe just below the level of the gluteal crease where it rests more superficially. One approach may be selected over another depending on the patient's anatomical characteristics and the operator's preferences. For the majority of individuals and circumstances, including obese patients, the posterior route might be a superior option.

ULTRASOUND ANATOMY

The gluteus maximus muscle, which is normally several centimetres thick, is considered to be the most superficial muscular layer connecting the two osseous bones. Sciatic nerve is situated superficially to quadratus femoris muscle and immediately deep to gluteus maximus muscle. Frequently, it is marginally nearer the greater trochanter than the ischial tuberosity. At this location in thigh, it shows as an oval or roughly triangular hyperechoic structure. The long head of the biceps femoris muscle and the posterior surface of the adductor magnus are where the sciatic nerve is located at the subgluteal level.

LANDMARKS AND PATIENT POSITIONING

The patient is placed in a lateral decubitus position. At the hip and knee, the limbs are flexed. To detect and decipher motor responses when nerve stimulation is used

simultaneously (recommended), the hamstrings, calf, and foot must be exposed.

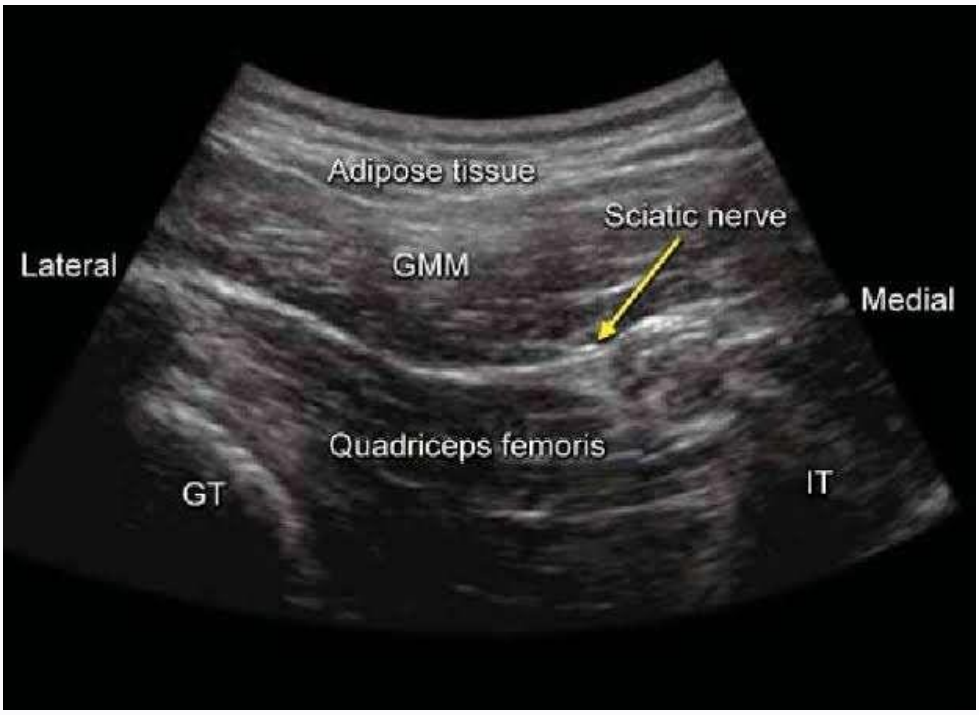


Figure- 12: Sciatic nerve through posterior approach via ultrasound guided

INDICATIONS AND CONTRAINDICATIONS OF SCIATIC NERVE BLOCK

When more conservative methods have failed, regional blocks should be used. They are also used to prevent the negative effects and complications associated with general anaesthesia and oral drugs. Examples of situations where peripheral nerve blocks may be preferred include the following: [81]

- Patients who prefer to avoid taking regular drugs;
- Patients who are intolerant of or unresponsive to oral medications;

- Patients who are at high risk for respiratory depression brought on by general anaesthesia;

Peripheral nerve blocks are absolutely contraindicated in cases of: allergy to

- local anaesthetics;
- inability to cooperate; and Patient refusal.
- When there is an active infection at the injection site, pre-existing neural impairments coincident with the distribution of the block, patients with coagulopathies, or those on antithrombotic medications, it is advisable

LOCAL ANESTHETICS

Local anaesthetics inhibit neural transmission by inhibiting sodium ion inflow via channels or ionophores inside neuronal membranes. Normally, sodium ions are barred from entering these channels because they are in a resting condition. The channel assumes an active or open state when the neuron is stimulated, which causes sodium ions to diffuse into the cell and start the depolarization process. Following this sudden change in membrane voltage, the sodium channel goes into an inactivated state, blocking further influx while active transport mechanisms send sodium ions back to the outside. The channel then repolarizes and goes back to being in its normal resting state. Understanding these sodium channel states makes it easier to understand why different kinds of neural fibres respond to local anaesthetics differently.

GENERAL PROPERTIES OF LOCAL ANESTHETICS

A lipophilic aromatic ring, an intermediate ester or amide bond, and a tertiary amine are all components of the molecular structure of local anaesthetics. The molecule has specific therapeutic properties thanks to each of these components.

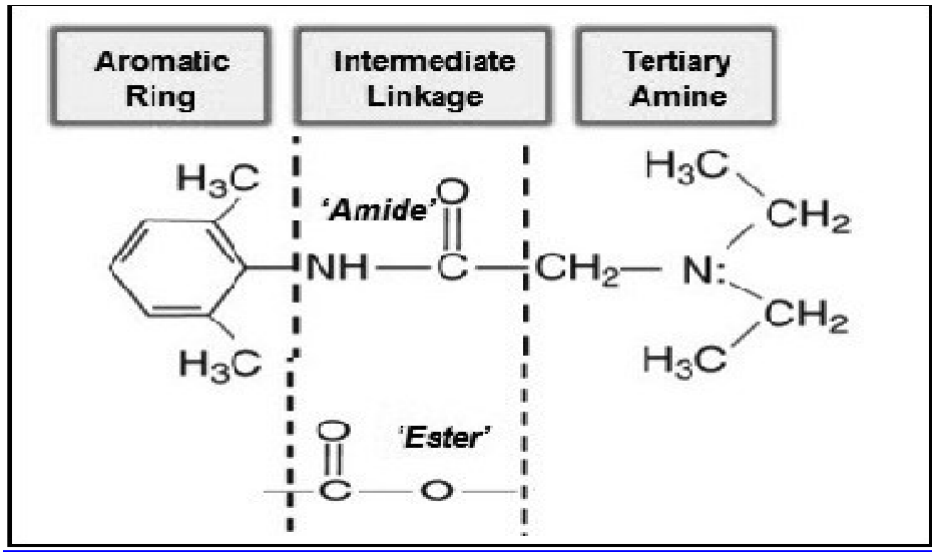


Figure 13: Local anesthetic structure.

ANESTHETIC POTENCY

Local anaesthetics can be used at concentrations that generally vary from 0.5 to 4% due to their variable efficacy. Variations in lipid solubility, which allow diffusion through neural membranes and nerve sheaths, are mostly to blame for this. The tertiary amine's feature is determined by the aromatic ring, any changes made to it, and any alterations added to it. Since bupivacaine is more potent and fat soluble than articaine, it may be manufactured at a concentration of 0.5% (5 mg/mL) as opposed to 4% (40 mg/mL).

LOCAL ANESTHETIC MECHANISM OF ACTION

Local anaesthetics are substances that obstruct the peripheral nervous system's ability to transmit impulses, which slows down the excitation-conduction process[57]. Most synthetic compounds with local anaesthetic effect include an intermediate chain connecting an aromatic ring to an amine group in their basic structure[58].The area next to the nerve is treated with local anaesthetic solution. The evacuation of drug molecules from this location by the circulation, tissue binding, and local aminoester anaesthetic hydrolysis are all factors in drug diffusion. The remaining drug molecules ultimately manage to penetrate the nerve sheath. Then, local anaesthetic molecules penetrate the axon membranes of the nerve and equilibrate both there and in the axoplasm. The pKa and lipophilicity of the base and cation species in a given medication determine how quickly and how much of these activities occur. Local anaesthetic binding to voltage-gated Na+ channel sites restricts channel opening by preventing structural changes that are important for channel activation. During onset and restoration from local anaesthesia, incomplete impulse blocking occurs, and partly blocked fibres are further inhibited by recurrent stimulation, resulting in an additional use- or frequency-dependent adherence to Na+ channels.The drug's resting and use-dependent effects may be explained by just one local anaesthetic binding site on the Na+ channel. Although there may be other different paths that could lead to this location, the hydrophobic

approach from within the axon membrane is the main strategy for clinical local anaesthetics. The clinically observed rates of start and recovery from blocking are controlled by comparatively slow diffusion of local anaesthetic molecules into and out of whole nerve, not by their noticeably quick binding and dissociation to ion channels. [36]The maximum sodium current that may pass through each membrane, which is 5–6 times larger than what is required to initiate an action potential, is known as safety factor of conductance. Local anaesthetics decrease this safety factor by progressively lowering sodium channel excitability; when it reaches zero, conduction fails.The likelihood that an incoming impulse will stop at a specific location along a nerve is known as impulse extinction. It is influenced by the amount and concentration of local anaesthetic, the length of nerve fibre exposed to local anaesthetic, and whether or not myelination is present. It is known as temporal onset when the onset of conduction block varies between various nerve fibres. To obtain the same frequency of impulse extinction, a larger fibre requires a slower block and a higher agent concentration.

Local anaesthetics provide an equilibrium between the protonable amine group's charged (AH) and uncharged (A:) states: The dissociation constant (Ka) of the chemical and the solution's pH have an impact on the relative quantities of each form.

Because cationic form of the drug predominates, acidic hydrochloride salt solution commonly used to make local anaesthetic improves drug's solubility. After injection, tissue's buffering system raises pH of the solution, allowing extracellular fluid to quickly reach equilibrium.

According to certain theories [59, 64] both charged and uncharged versions of excitable cells are necessary for local anaesthetics to work on them. By examining effects of pH utilising tertiary compounds in early 1970s, Narahashi et al.[60] came to conclusion that local anaesthetics enter neuronal membrane in uncharged form and inhibit action potential from inside membrane in charged form.

Research using local anaesthetic quaternary analogues [62,63] on either inside or outside of axon in single nerve sections gave proof for this claim. These equivalents are always ionised and cannot diffuse through cell membrane because lipid bilayer acts as a hydrophobic barrier for charged substance.[61]

These quaternary analogues had little local anesthetic effect when applied outside nerve cell, but they were quite active when perfused insid axon.

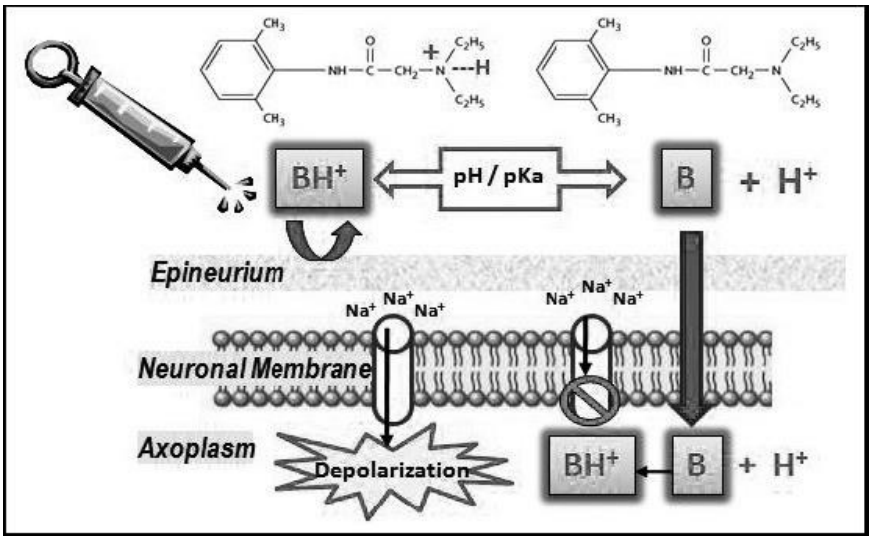


Figure 14: Local anesthetic mechanism of action.

An injected local anesthetic exists in equilibrium as a quaternary salt (BH+) and tertiary base (B). The proportion of each is determined by the pKa of the anesthetic and pH of the tissue. The lipid-soluble base (B) is essential for penetration of both epineurium and neuronal membrane. Once the molecule reaches axoplasm of neuron, amine gains a hydrogen ion, and this ionized, quaternary form (BH+) is responsible for actual blockade of sodium channel. The equilibrium between (BH+) and (B) is determined by pH of tissues and pKa of anesthetic (pH/pKa).

LOCAL ANESTHETIC SYSTEMIC TOXICITY

According to current estimates, 0.27 episodes or 0.03% of all LA operations result in local anaesthetic systemic toxicity (LAST), a potentially deadly side event connected to frequent use of local anaesthetic (LA) techniques in different

healthcare settings. The continued dangers of LAST are a result of growth of LA procedures, including appearance of high-volume fascial plane approaches, increasing importance of continuous catheter techniques, use of several LA techniques on same patient, and use of tumescent anaesthesia.[83]

TOXICITY.

Local anesthetic toxicity is related to high plasma levels of the drug found in

- Drug overdosage
- Direct intravascular injection
- Rapid absorption/injection into a highly vascular area as in intercostals block
- Continuous infusion of local anesthetic or cumulative effect of continuous infusion/multiple injections.

Equally important are:

The site of injection with relation to vascularity and injection, metabolic states like acidosis, hypoxia and hypercarbia which potentiate negative inotropic/chronotropic effects of local anesthetics. Whenever possible, keep with in maximum dosing recommendations, aspirate carefully before injection, and divide large volume injections into smaller volumes.

SYMPTOMS & SIGNS OF TOXICITY

Mild toxicity : Circumoral numbness, tongue parasthesia, blurred vision, tinnitus, metallic taste, slurred speech, light headedness.

Moderate toxicity: Altered consciousness, drowsiness, agitation, restlessness, unconsciousness, and convulsions.

Severe toxicity : Cardiovascular collapse, arrhythmias, cardiac arrest, respiratory arrest, coma

MECHANISM

The mechanisms by which LAST produces its clinical manifestations can be elucidated from pharmacokinetics of LAs.

PHARMACOKINETICS OF LOCAL ANESTHETICS [83]

The rate of systemic absorption determines peak plasma concentration of LA and the time needed to reach those levels. The vascular supply of injection sites and the amount of drug deposition both have a role in this. Once in the plasma, perfusion controls how much LA is distributed to the organs, with well-perfused tissues like the brain, heart, liver, and lungs initially receiving majority of LA mass. The

drug's free form, which is present in plasma, is what defines its clinical and hazardous effects as well as how quickly it is metabolised. While protein binding of aminoester LAs, such as procaine and chloroprocaine, is so minute as to be clinically insignificant, aminoamide LAs, such as lidocaine, bupivacaine, and ropivacaine, are substantially protein bound to 1-acid glycoprotein. Depending on pharmacology of the drug, hepatic cytochrome P450 (CYP/CYP450) enzymes significantly first-pass enzymatically metabolise aminoamide LAs at varying rates. Plasma cholinesterases quickly hydrolyze aminoester compounds, resulting in water-soluble metabolites that are eliminated in the urine.

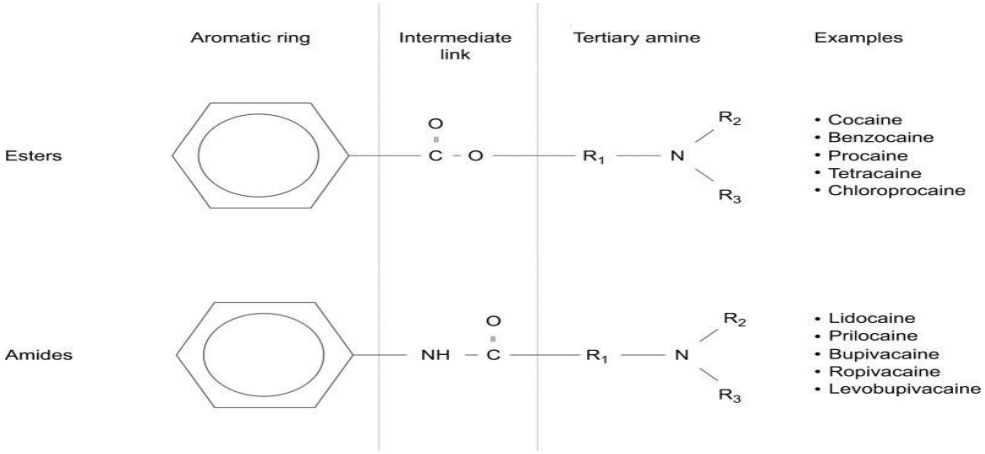


Figure 15: Chemical structures of ester and amide local anesthetic agents

TREATMENT

Stop injection/infusion as appropriate.

Mild symptoms may be treated with oxygen and midazolam (increases seizure threshold).

For moderate or severe toxicity, cardiovascular collapse is normally preceded by convulsions and is related to drug over dose in the presence of hypoxia.

The first priority is, therefore, to prevent convulsions and maintain oxygenation.

If the consciousness level is deteriorating or there are continuous convulsions intubate (with thiopental/suxamethonium, but propofol or midazolam are suitable alternatives) and ventilate with 100% oxygen. If cardiovascular collapse ensues begin CPR.

MATERIALS

After ethical committe clearance , 84 patients undergoing lower limb surgeries were selected for study during period of November 2020 to August 2022 at the Department of Anaesthesiology, B.L.D.E(Deemed to be University) ShriB. M. Patil Medical College, Hospital and Research Centre, Vijayapura.

Aim :

The aim of the study was to compare between the anterior approach and posterior approach to sciatic nerve block with regard to patient comfort, technical difficulty and quality of block .

Objectives :

- Compare number of attempts and time taken to perform block
- Compare onset of sensory and motor blockade.
- Compare the duration of analgesia, quality of the block and success rate of the procedure

Study design: Randomized comparative study.

Sample size: 84 patients were selected based on inclusion criteria, Patients were randomly assigned using card method to receive the anterior approach (group A; n = 24), and classic posterior approach (Labat) (group B; n = 24) of sciatic nerve block.

Statistical Analysis:

Sample size is based on minimum number required to consider $p< 0.05$ as significant. They were divided by computer generated random number method in two groups of 42 each. Group A (n=42) patients received anterior approach and Group P (n=42) patients received posterior approach to sciatic nerve block.

The anticipated Mean±SD of sensory block onset in group A 12.87±7.38 and group p10.53±5.42 resp. (ref) the required minimum sample size is 42 per group to achieve a power of 99% and a level of significance of 5% (two sided), for detecting a true difference in means between two groups.

- Level of significance=95%
- power of the study=90%

d=clinically significant difference between two parameters

SD= Common standard deviation

The data obtained was entered in a Microsoft Excel sheet, and statistical analysis was performed using statistical package for the social sciences (Verson 20). Results are presented as Mean±SD, counts and percentages and diagrams.

For normally distributed continuous variables between two groups were compared using Independent t test for not normally distributed variables Mann Whitney U test will be used. Categorical variables between two groups will be compared using Chi square test. P< 0.05 were considered statistically significant. All statistical tests were performed two tailed.

Inclusion criteria:

- Patients scheduled for lower limb surgeries
- ASA grade I, II and III
- Aged between 20 to 80 years.

Exclusion criteria:

- Patient's refusal for study
- Patients with neuromuscular disease, coagulation abnormalities, haemostatic abnormalities, skin infection at the site of needle entry
- Patients with chronic pain syndrome or receiving chronic analgesic therapy
- Patients with reported history of allergy to amide local anesthetic drugs

METHODOLOGY

Pre-anesthetic evaluation:

Patients were included in the study by thorough pre-operative evaluation which includes the following:

History:

History of underlying medical illness, previous history of surgery, anesthetic exposure and hospitalization will be taken.

Physical examination:

- General condition of the patient.
- Vital signs- heart rate, blood pressure, respiratory rate.
- Height and weight.
- Examination of cardiovascular system, respiratory system, central nervous system and the vertebral system.
- Airway assessment by Mallampati grading.

INVESTIGATIONS :

Complete blood picture, chest x ray, ECG, RBS,Coagulation profile, 2DECHO(if ECG changes present).

Preoperative Preparation: All patients were visited and evaluated thoroughly on the day prior to surgery. During the preanaesthetic examination evaluation of all the systems were taken. The anesthetic procedure to be undertaken was explained to the patients and an attempt was made to alleviate the anxiety of patient. A written informed consent was taken.

Before entering operating room, all patients fasted for about 8 hours. An IV infusion of activated Ringer's solution was started at a rate of 1-3 ml/kg/hr.

Standard non-invasive monitors were attached, oxygen was administered using a facemask, and Inj.midazolam 1-2 mg was administered for anxiolysis if necessary while making sure the patients were still attentive to verbal commands.

Patients were randomly split into two groups and administered anterior and posterior (subgluteal) methods of sciatic nerve block utilising the envelope technique.

In order to image the sciatic nerve for the posterior approach, a linear probe (3-9Hz) was used, and in order to image the sciatic nerve for the anterior approach, a curvilinear probe (2.5 mhz) was used.

Group A: For the anterior approach, the patients were placed supine with leg externally rotated at about 45 degrees , hip and knee on operated side flexed. About 8 cm distal to inguinal crease, ultrasonic transducer (curvilinear probe) was initially placed perpendicular to skin. Once a clean transverse picture of hyper-echoic sciatic nerve lying posterio-medial to lesser trochanter was acquired, the area was further scanned by moving and tilting the transducer. Following the application of an iodine-containing solution to the skin to disinfect it, sciatic nerve was preserved in centre of ultrasound image and a hypodermic needle was inserted parallel in line plane with the ultrasound transducer covered with a sterile plastic cover and gel, from anteriomedial to posterolateral the thigh. The needle was gradually introduced until it was near nerve under real-time ultrasound supervision. Using 10ml of injection bupivacaine 0.5%, 10ml of injection lignocaine 2%, 5ml of injection lignocaine with adrenaline, and 5ml of distilled water, the local anaesthetic solution was taken and then incrementally injected.The needle tip was

repositioned so that a circumferential spread of the solution could be produced and the spread of local anaesthetic solution was confirmed by USG.

Group P: For posterior approach,patients were positioned laterally with side to be anaesthetized topmost, and hip and knee where surgery would be conducted were flexed at a 45-degree angle. An ultrasound transducer (linear probe) placed perpendicular to skin on this line produced a clear transverse picture of hyper-echoic sciatic nerve between ischial tuberosity and greater trochanter. Following skin disinfection with an iodine-containing solution, a needle was inserted parallel and in line with ultrasound transducer from posterolateral to anteromedial. A local anaesthetic solution was administered, similarly with anterior method.

Following sciatic nerve block, patients in both groups were put in a supine posture with both legs extended. No additional local anaesthetics were used during the surgerical procedure. Injection of 1 to 2 mg of midazolam were given to the patients if needed.

Following the infusion of local anesthetic solution for 30 minutes, sensory and motor blockade on the operated limb was assessed every 5 minutes, and then again every 2 hours after the surgery was finished. Pinprick test was used to perform

sensory examination on the posterior cutaneous nerve of the thigh, the tibial nerve, the superficial nerve, the posterolateral area of the leg, and the plantor area of the foot.

When there was no longer a pinprick sensation for the patient, sensory block was deemed complete. When the patient was incapable of dorsiflexing or flexing their foot, the motor block was deemed to be complete.

ASSESSMENT METHOD

THE PINPRICK TESTING [84,85]

Assessing the integrity of non-myelinated pain fibres and their input as a component of the spinothalamic pathway is the goal of "pinprick" testing for pain sensation (separate from dorsal column functions). In contrast to light touch, only cues that assess pain are helpful. Two methods that are frequently used are (a) a clean (new) safety pin that is thrown away after use, or (b) a broken tongue depressor or broken wooden swab stick that is used if a good point can be obtained for a "pinprick" and is thrown away after use.

On skin that has not previously been pinched or wounded, a hollow straight 20-24G needle with an insertion angle of nearly 90 degrees is applied to the distal anastomosis pedicle skin paddle. The subcutaneous fat of flap is accessible by

inserting needle through dermis. Because proximal needle side exits skin surface with an angled bevel, a slower extraction speed of needle allows fresh blood to enter lumen. Within five seconds following full needle extraction, a drop of blood (bigger than a mm) appears on the flap skin surface..

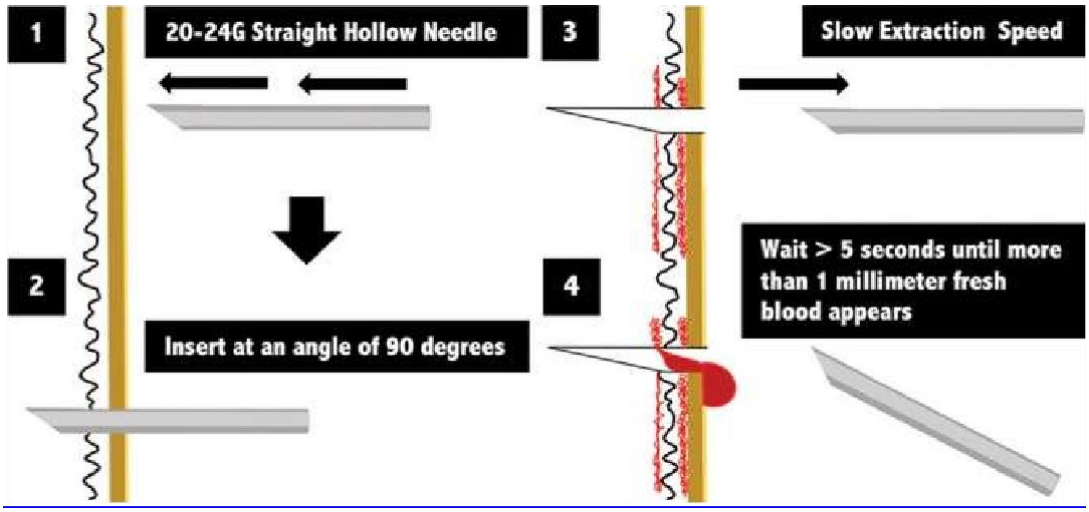


Fig ure-16: The pin-prick test: 1: 20-24 Gauge hollow straight needles, 2: Slow needle extraction speed, 3: 90 degrees angle of insertion, 4: Wait up to five seconds until physiological fresh blood appears.

BROMAGE SCALE [86]

The Bromage scale is the most often used motor block indicator. The patient's ability to move their lower extremities is used to gauge the severity of motor block using this scale. The Bromage score's most major drawback in research on labour analgesia is that it was created to assess variations in surgical blocks and is mostly

useless to assessing motor block caused by diluted local anaesthetic solutions used in labour analgesia.

Bromage 0	Subject is able to move the hip, knee and ankle and is able to lift his leg against gravity
Bromage 1	Subject is unable to lift his leg against gravity but is able to flex his knee and ankle
Bromage 2	Subject is unable to flex his hip and knee, but is able to flex his ankle
Bromage 3	Subject is unable to flex his hip, knee and ankle, but is able to move his toes
Bromage 4	Complete paralysis

Figure 17: Bromage scale

VAS SCORE

Visual Analogue Scale (VAS) are psychometric measuring tools created to record the characteristics of disease-related symptom severity in individual patients and use this to quickly classify symptom severity and disease control (statistically measurable and reproducible). The VAS score is also applied to the standard patient history. The patient indicates the degree of pain as perceived by them by a mark on the line.The length of the linefrom left hand margin to the mark determines the intensity of pain. The vas score stratified as , if the score is <6 was comfortable to the patient and if the score is >6 was not comfortable to the patient.

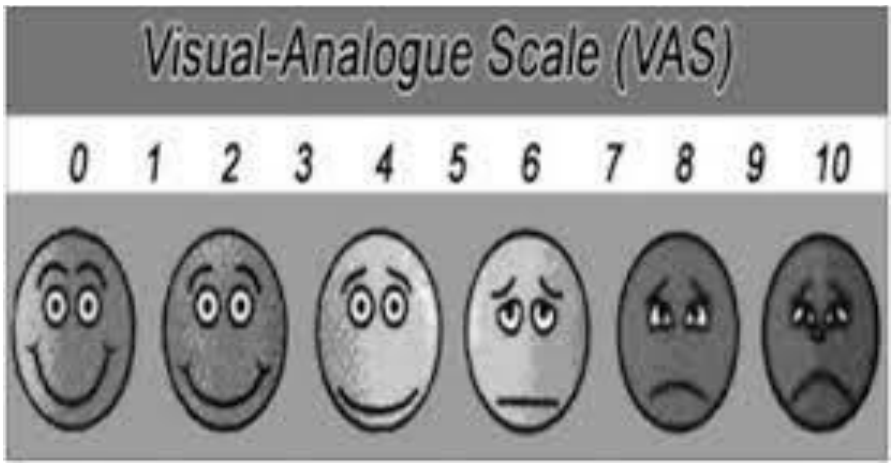


Figure 18: VAS score

EQUIPMENTS USED

An autoclaved pack for Sciatic nerve block consisting of

- Ultrasound machine with a curvilinear probe for anterior approach , linear probe for posterior approach .
- Sterile ultrasound probe covers
- Ultrasound gel
- Inj.Bupivacaine 0.5% 20 ml vial.
- Inj.Lignocaine 2% 40 ml vial.
- Inj.Lignocaine with adrenaline 2 % 40 ml vial.
- Syringe of 2ml with 26 G hypodermic needle for skin infiltration
- Syringes of 10 ml with 22 G hypodermic needle.

BUPIVACAINE

-Bupivacaine is a widely used local anesthetic agent.

-Slow onset.

-Longer duration of action.

-Used for infilteration, spinal nerve block and epidural.

- High lipid solubility, high distribution in tissues and less in blood.

-More cardiotoxic than other local anaesthetics(prolong QT interval).

-Should not be given as intravenously.

-Available as 0.25%, 0.5%, and 0.75% injections.

-Possible pathways for metabolism – aromatic hydrolysis and conjugation.

LIGNOCAINE

-Lignocaine is a member of amino amide class of local anesthetics.

- It inhibits nerve impulse production and conduction by raising the threshold for electrical stimulation in the nerve, delaying nerve impulse propagation, and lowering the rate of increase of the action potential.

- Half life is 90 minutes.

- Distribution is wide.

- pH is 6.5.

- Rapid onset of action.
- Protein binding is 60-80%.
- Metabolized in liver.

LIGNOCAINE WITH ADRENALINE

Adrenaline is frequently combined with lignocaine to enhance the duration of anaesthesia, decrease toxicity, to achieve vasoconstriction and to provide a bloodless field . Disadvantage is with the large doses of adrenaline aoosciated with cardiac rhythm distrubences.

Contraindications:

- In block of digit, foot, penis.
- Local infilteration of skin flap.
- Severe hypertension, hyperthyroidism, pregnancy induced hypertension.

DATA COLLECTION

Demographic and anthropometric data including age, gender, height and weight were collected. The following various parameters were collected from both groups:

- Time to perform block.
- Number of attempts.
- Onset of sensory block.

- Onset of motor block.
- Duration of analgesia.
- Comfort of the patient

REVIEW OF LITERATURE

Sciatic nerve block is a well-recognized technique for providing anesthesia and post-operative analgesia for lower limb surgeries.

- In a prospective, randomised controlled study, G. Danelli et al. randomly allocated 44 ASA I–III patients getting posterior popliteal sciatic nerve block with 20 ml of 0.75% ropivacaine to either nerve stimulation or ultrasound-guided nerve block. A blinded observer recorded onset of sensory and motor blocks, success rates, need for fentanyl intra-operatively, demand for general anaesthesia, procedure-related pain, patient satisfaction, and side effects. The onset times of sensory and motor blocks were identical. In contrast to nerve stimulation, ultrasound-guided procedure had a 100% success rate ($p = 0.116$). Fewer needle redirections ($p = 0.01$), reduced procedural pain ($p = 0.002$), and a shorter process duration ($p = 0.002$) were all effects of ultrasound guidance.Ultrasound guiding lowered the amount of time required for block performance as well as procedural discomfort.[24]

- In a research done by Junichi Ota et al. with 100 patients determined that anterior approach worked as simply and well as the posterior approach utilising USG guidance ($p< 0.001$). In patients getting anterior technique as opposed to the subgluteal method, sciatic nerve was detected much deeper and needle depth was significantly greater. Both methods took same amount of time to complete sciatic nerve block, however first required less time than the second to complete all possible block combinations. Between the two groups, there were no differences in peroneal and tibial nerve block success rate, onset time, or duration. [11]

- .Abdulkadir Yektar[25] discovered that time to onset of sensory block was significantly shorter in group P than in group A (7.70± 2.05 min and 12.88± 4.87 min, respectively; $p = 0.01$) in a randomised controlled experiment with 58 patients. Additionally, group P had a significantly higher mean fentanyl dose per patient after block but before start of procedure (44.03± 23.78 µg for group P and 31.20± 27.79 µg for group A), a significantly longer time to first fentanyl administration, and a markedly shorter time to first fentanyl necessity after block but before start of procedure (00.00± 00.00 min for group P and 4.05±7.47min.

- In a comparative study between USG guided and nerve stimulation guidance for sciatic nerve block done by Wafik A Amin et al.with 36 patients , Only one-third of the sciatic nerves could be visualized by US. This did not affect the block execution time but caused less number of needle passes in a statistically significant value. Sensory and motor block showed significant differences between the 2 groups. Criteria of acute systemic toxicity and occurrence of hematoma were not reported in both groups.[26]

- Labat G pioneered traditional posterior method to sciatic nerve block. The posterior superior iliac spine (PSIS) is identified, and greatest point of larger trochanter iliotrochanteric line is traced and bisected between these two components. A perpendicular line is drawn downwards and medially approximately 3 cm from this midway. Several publications have identified necessity to extend this perpendicular line up to 5cm.[6]

- George P.Beck was the first to describe the anterior approach in 1963. His approach located the SN near the lesser trochanter using the anatomic landmarks of the anterior superior iliac spine, lateral border of the pubic symphysis, and the greater trochanter. Beck’s procedure necessarily

involves needle contact with the femur. In 22 cases, sciatic nerve blocks were done. From the commencement of the proper landmark determination until the stimulation of the sciatic nerve's common peroneal nerve component in 13 cases and its tibial nerve component in 9 cases, the sciatic nerve was recognised in all patients in less than 2.5 minutes (1.2–5 min). Within 15 minutes, a full sensory block in the distribution of the tibial and common peroneal nerve components was achieved (5-30 min). In comparison to patients who got a combination of mepivacaine and ropivacaine, patients who received mepivacaine alone experienced a shorter onset (10 min [5-25 min] vs. 20 min [10-30 min]; P 0.05).[28]

- Labat's method was updated by Winnie et al. in 1974 by including a line from the sacral hiatus (SH) to the tip of the GT. The perpendicular line no longer needed to be measured; instead, it was extended until it crossed the new "sacro trochanteric" line. While local anaesthetic procedures frequently result in good surgical circumstances, they are constrained by the anaesthetic drugs duration of action and the patient's capacity to stay motionless, frequently in painful postures, for up to twenty hours.[5]
- Wildsmith J.A.W, Armitage E.N, Mc Clure J.H described five methods of blocking sciatic nerve at the level of hip and stated that posterior approach is

easy to perform with high success rate and anterior approach is useful in patients with pain and who cannot move involved limb.[30]

- Steur [31]described a method for femoral and sciatic nerve block in children with a single needle injection. Children were the only ones who could use this approach. He made use of Beck as a marker and an entry point.

- Pandin et al. [32] described a simultaneous sciatic and femoral nerve block at a single skin injection site using the classic Winnie's and Beck's landmarks. These methods had certain limitations, such as the difficulty to detect the greater trochanter as well as other landmarks, which was especially problematic in obese individuals or patients who had undergone trauma or substantial arthritis in the lower leg.

- In Pandin eAysun et al's [33] anatomical study, the inguinal crease and femoral artery were used as landmarks to describe safe and reliable landmarks for the anterior approach for the sciatic nerve and examine if the femoral nerve can be blocked concurrently with such an approach through a taken from patients feasibility study.

- In this randomised, double-blind, volunteer experiment, this step-up/step-down protocol was utilised to assess the ED (99) volume of local anaesthetic for sciatic nerve blocks. An ultrasound-guided sciatic nerve block with mepivacaine 1.5% and an initial dose of 0.2 ml/mm2cross-sectional nerve area was done on a maximum of 20 patients. In full sensory block conditions, volume was reduced by 0.02 ml /mm2 cross-sectional nerve area until first block failed. Following that, 0.02 ml /mm2 cross-sectional nerve area more local anaesthetic was added. A probability function could be used to determine the ED (99) volume of local anaesthetic after three cycles of successful/failed blocks. By using linear regression, the effects of local anaesthetic volume on sensory onset times and sensory block length were assessed. [22]

- In peripheral nerve treatments, ultrasound guidance enables for real-time viewing of the needle, increasing accuracy and safety. For diagnostic reasons and procedure improvement, sonographic imaging of the peripheral nerve and surrounding anatomy can offer useful information. The suprascapular nerve at the suprascapular notch, the deep radial branch at the supinator, the median nerve at the pronator teres and carpal tunnel, the lateral cutaneous nerve of the thigh, the superficial fibular nerve at the leg,

the tibial nerve at the ankle, and interdigital neuroma are common procedures that are covered. The indications, pertinent anatomy, preprocedural scanning method, and actual injection procedure are all covered in depth for each procedure. [19]

- According to theory, lumbar plexus block or femoral nerve block may be used alone or in conjunction with sciatic nerve block to provide anaesthetic and/or analgesia during lower limb surgery. Technical challenges in administering the block, as the techniques used rely primarily on surface anatomical features, have, however, restricted the use of sciatic nerve blocks in clinical settings. The interest in executing various types of peripheral nerve blocks, including the sciatic nerve block, has surged as a result of recent developments in ultrasound technology that allow direct viewing of nerves and other surrounding structures. According to preliminary research, an ultrasound-guided approach may make it easier and safer to conduct a sciatic nerve block. The sciatic nerve's structure, sonographic characteristics, and three main approaches—the subgluteal, anterior, and popliteal approaches—are all covered in this article. Also highlighted is the application of this method for postoperative analgesia. [16]

- A frequent method for numbing and relieving pain in the lower extremity is sciatic nerve block. The traditional methods are posterior or lateral approaches. However, in some circumstances where patient posture might be challenging, an anterior approach should be taken into account. The sciatic nerve block with previously described techniques has been reported to have a poor success rate, but these procedures have been discovered to have a significant complication rate. In order to define a new anterior method to block the sciatic nerve and determine whether the femoral nerve can also be stopped using this technique, we conducted an anatomical investigation. On 11 lower extremities, numerous landmarks and useful metrics were initially looked at. For determining the most effective approach to the sciatic nerve anteriorly, eight lower extremities were used. Once established, an anaesthetic needle was used to inject Indian ink into the two cadaveric extremities. Dissection was used to assess the needle's path, and we looked to see if the ink stained the sciatic nerve or damaged nearby neurovascular structures. To see where the injection needle went after it was inserted, the remaining extremity was sliced axially. [13]
- Nerve stimulation may be used with ultrasound imaging to treat a block of deeply situated nerves, such as sciatic nerve in subgluteal area. It is yet unclear how nerve stimulation may affect blockage after this nerve block.

We retrospectively investigated the effects of the two types of motor response and those of minimum induced current above and below 0.5 mA on ultrasound-guided subgluteal sciatic nerve block with mepivacaine or ropivacaine, two local anaesthetics with variable onset timings and durations. When nerve stimulation was employed in combination with ultrasound guidance for subgluteal sciatic nerve block, motor response pattern did not appreciably change the course of sensory or motor blockade or duration of block.. Longer block duration and quicker onset of sensory and motor block after mepivacaine and motor block after ropivacaine were both associated with lower minimum evoked current. However, its clinical significance has not yet been determined.[17]

- Jacques E. Chelly,[45] gave a summary of sciatic nerve block, pertinent anatomy, advances in the area, and provides a number of typical methods for treating the sciatic nerve. Contrary to popular assumption, he asserted, sciatic nerve blocks are rather easy to perform and master. The deep placement of the sciatic nerve, however, necessitates appropriate training and in-depth anatomical expertise. Sciatic nerve block procedures are now again gaining popularity, and various novel, more effective procedures have been developed. He mainly concentrated on the technical elements of selecting the best strategy, explaining the historical context and the small

differences in technique between the various strategies. A sciatic nerve block can be utilised in conjunction with a saphenous or femoral nerve block for any surgical treatment below the knee that doesn't call for a thigh tourniquet due to its extensive sensory dispersion. Additionally, it can be used in conjunction with other peripheral nerve blocks to give anaesthesia for thigh and knee surgery operations. This type of anaesthesia is helpful in situations when any change in hemodynamics might be harmful since it avoids the sympathectomy associated with neuraxial blocks. [76]

- Dalens B, Tanguy A, Vanneuville G [77] in their Comparison of the Posterior, Anterior, and Lateral Approaches of Sciatic Nerve Blocks in 180 Pediatric Patients in the Posterior group found effective block on the first try in 88% of patients, 78% in the Lateral group, and 62% in the Anterior group, with significant variations in the length of either the motor or sensory block in the three groups when the identical local anaesthetic solution was administered. All anaesthetic solutions caused sensory blockade to last much longer than motor blockade, although using the same local anaesthetic on all three groups resulted in no discernible changes in the length of either block. When typical twitches are elicited in muscles supplied by the sciatic nerve, despite the great depth to which the needle must be inserted, almost 100% good results can be anticipated. This makes the use of a nerve

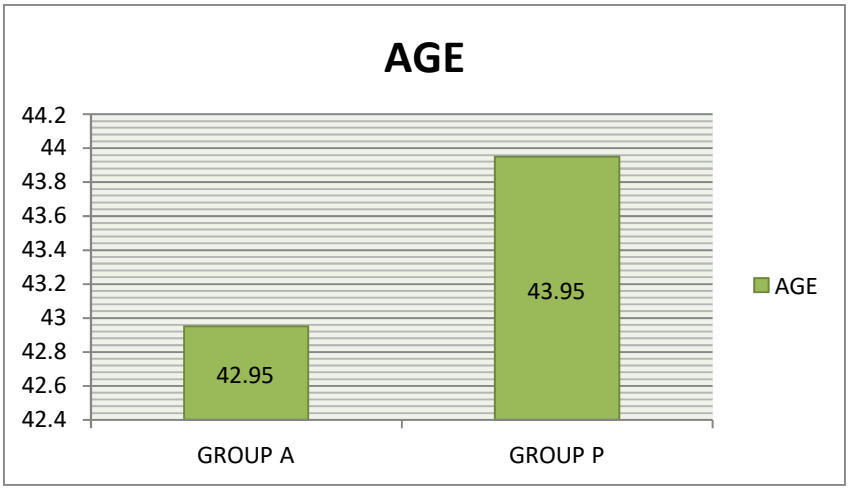
stimulator delivering 2-mA impulses every second an invaluable aid in locating the sciatic nerve.

RESULTS

TABLE 1: COMPARISON OF AGE DISTRIBUTION (Age in years)

	Group A (n=42)	Group P (n=42)	P
Age (Year)	**42.95±12.69**	**43.95±8.68**	**0.935**

Table 1 shows the comparison of age distribution in both groups. The age of the study participant is almost similar in both groups. Samples are matched with age and there is no statistical significance (P= 0.935) in the comparison.

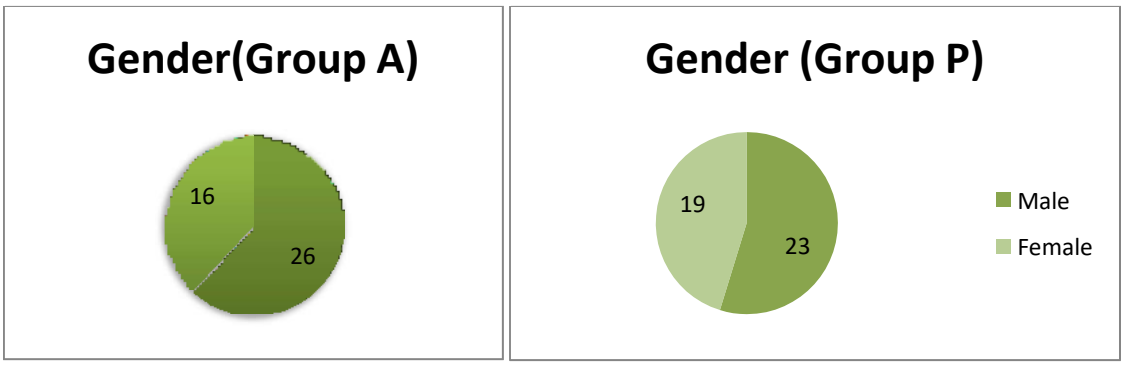


Graph 1: comparison of age distribution in both groups

TABLE 2: COMPARISON OF GENDER DISTRIBUTION

		Group A (n=42)	Group P (n=42)
Gender	**Male**	**26(31%)**	**23(27%)**
	Female	**16(19%)**	**19(23%)**

Tables 2 shows gender distribution in both groups. Samples are gender matched with Z=0, 2-Tail Confidence Level: 0%. There is no statistical significance seen in both groups. Males are higher in number with 26(31%) and 23(27%) in group A and group P respectively.

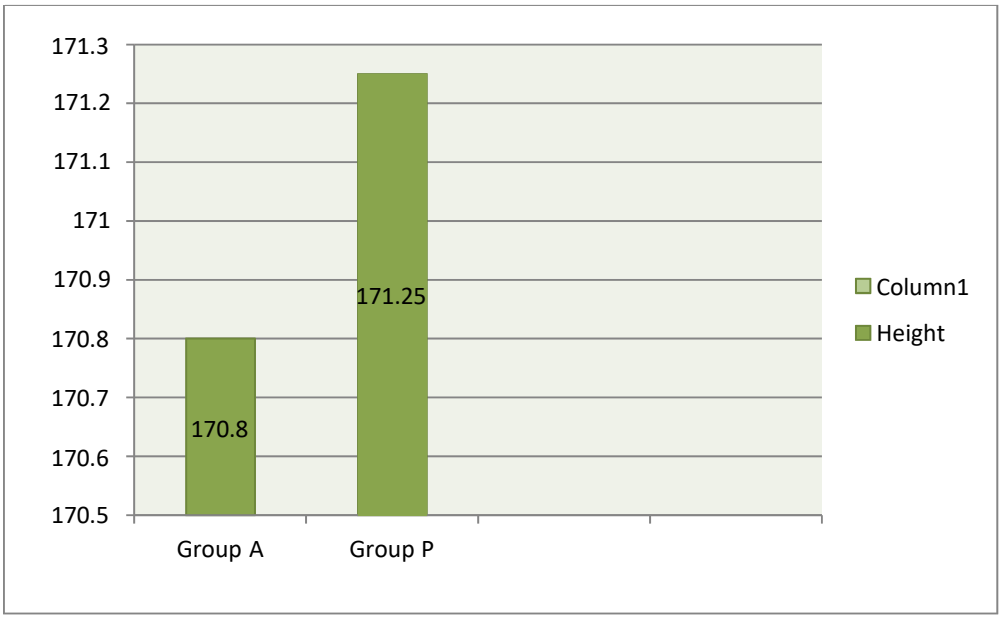


Pie chart 1:Comparision of gender in both groups

Table 3: Comparison of height in both groups (Height in centimeter)

	Group A (n=42)	Group P (n=42)	P
Height (cm)	**170.80±12.12**	**171.25±7.00**	**0.720**

Table 3 shows comparison of height in both the groups. Samples matched with height P= 0.720, 2-Tail. There is no statistical significance found between heights in both groups. The height is also found to be equal in both groups with 170.80±12.12 and 171.25±7.00.

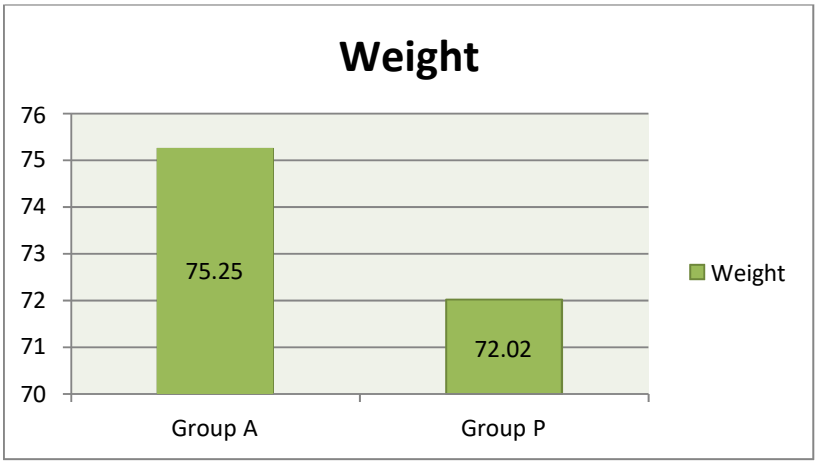


Graph 2 : Comparision of height in both groups

Table 4: Comparison of weight in both groups (Weight in kg)

	Group A (n=42)	Group P (n=42)	P
Weight (kg)	**75.25±15.12**	**72.02±10.09**	**0.516**

Table 4 shows comparison of weight in both the groups. Samples matched with weight with P= 0.516, 2-Tail. There is no statistical significance found between weights in both groups. The mean±SD in both group is around 75.25±15.12 and 72.02±10.09 respectively.

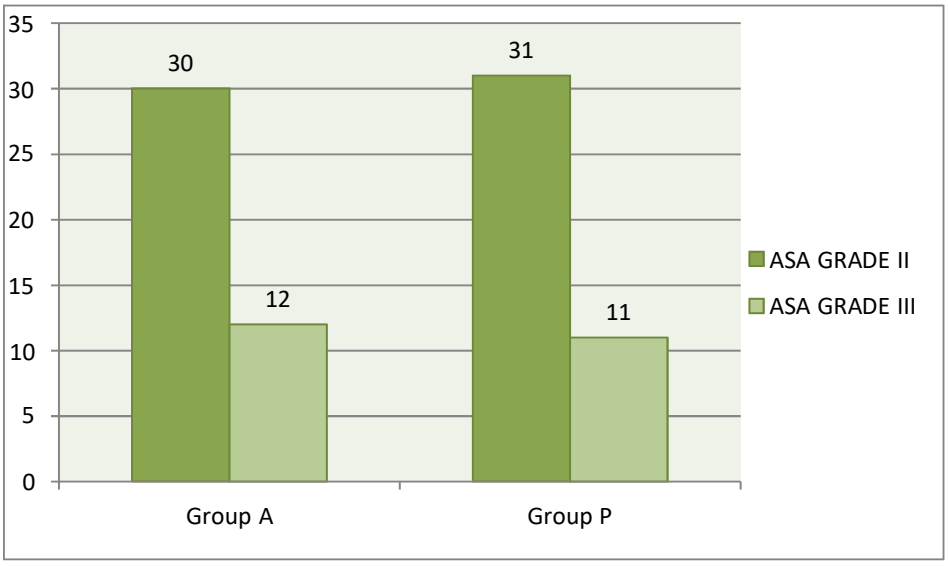


Graph 3: Comparison of Weight(kg) in both groups

Table 5: Comparison of ASA in both groups

		Group A (n=42)	Group P (n=42)	P
ASA	**II**	**30**	**31**	
	III	**12**	**11**	**0.795**

Table 5 shows the comparison of ASA in both groups. ASA grade II and III were analyzed and there is no statistical significance found between the group with P value 0.795



Graph 4: Comparison of ASA in both groups

Table 6: Onset of sensory and motor blockade in both groups

	Group P(n=42)	Group A (n=42)	P
Sensory Blockade (min)	**11.85±7.35**	**9.53±5.40**	**0.165**
Motor blockade (min)	**18.67±7.05**	**17.82±5.70**	**0.630**

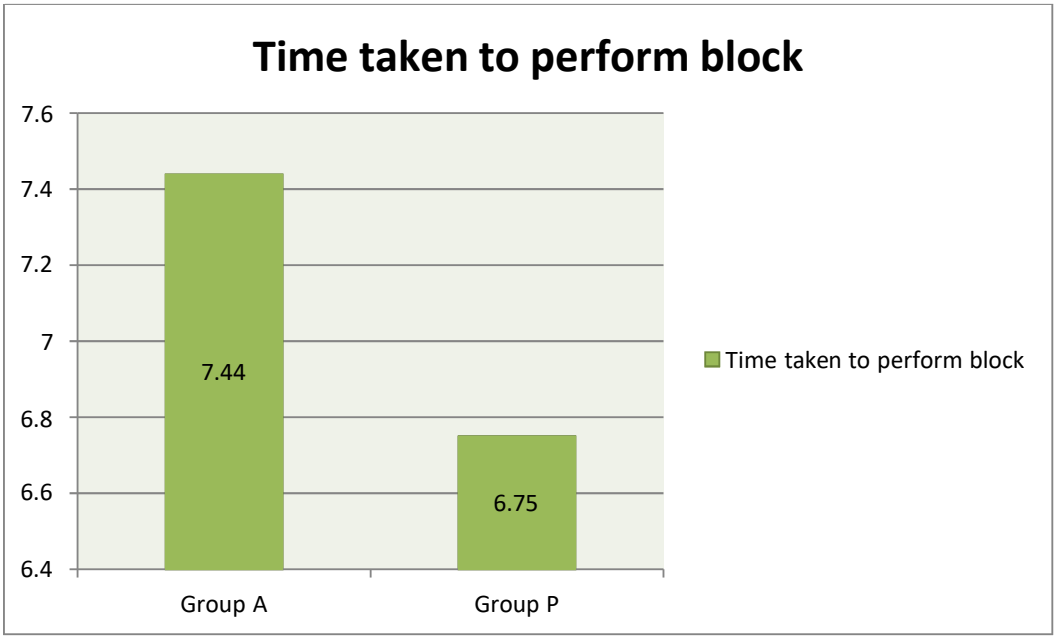
Onset of sensory block with group A is 9.53±5.40 min when compared to 11.856±7.35 min with group P. Faster onset of sensory block is seen with group A, but this is statistically not significant when compared to group B with a p value of 0.165.

Onset of motor block with group A is 18.67±7.05 min when compared to 17.82±5.70 min with group P. Faster onset of motor block is seen with group P, but this is statistically not significant when compared to group A with a p value of 0.630.

Table 7: Time to perform block in both groups

	Group P(n=42)	Group A (n=42)	P
Time to perform block (min)	**6.75±1.10**	**7.44±1.00**	**0.045**

Time taken to perform anterior approach to sciatic nerve block was 7.44**±1.00** min, when compared to 6.75±1.10 min with Posterior approach. **Time taken to perform the block is significantly less in group P than in group A (p< 0.05∗).**



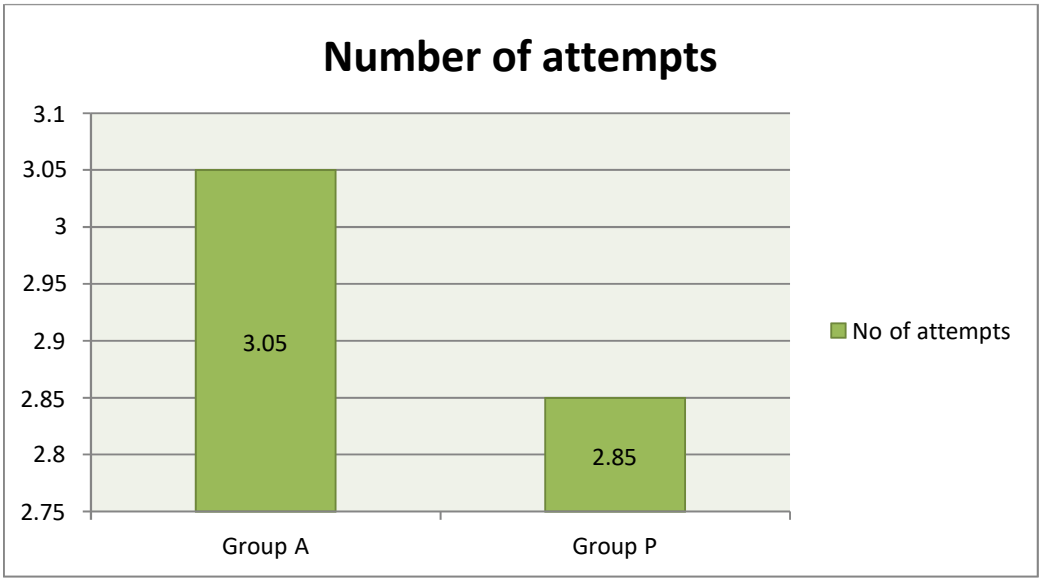
Graph 5: Time taken to perform block for the study participant

Table 8: Number of attempts taken to perform block in both groups

	Group P(n=42)	Group A (n=42)	P
Number of attempts	**2.85±0.90**	**3.05±0.91**	**0.395**

Number of attempts (2.85±0.90) is seen less in Group P than Group A (3.05±0.91).

No statistical significance is present between both the groups (p=0.395)

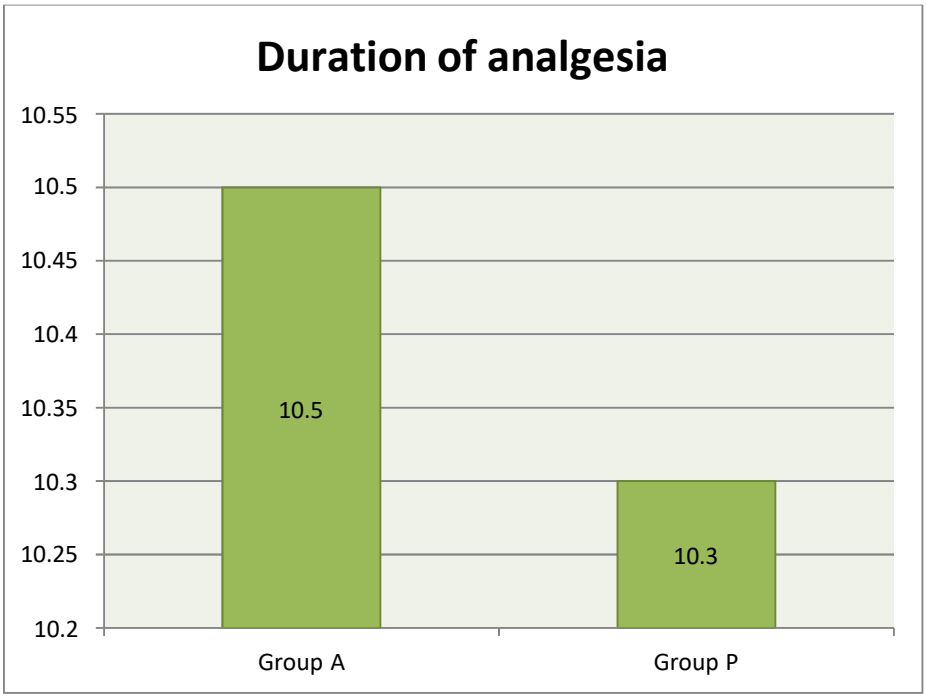


Graph 6: Number of attempts to achieve blocks

Table 9: Duration of analgesia in both groups

	Group P(n=42)	Group A (n=42)	P
Duration of Analgesia(Hr)	**10.3±3.5**	**10.5±4.0**	**>0.05**

Patients of Group A had duration of analgesia (10.5±4.0) and Group P has value with 10.3±4.0. It is almost similar in both the groups and there is no statistical significance between the groups with a p value >**0.05 at a confidence level :95%**



Graph 7: Duration of analgesia

Table 10: Comparison of patient satisfaction in both groups

	Group A (n=42)						Group P (n=42)						P
Vas score	**0**	**2**	**4**	**6**	**8**	**10**	**0**	**2**	**4**	**6**	**8**	**10**	
The comfort of patient(%)	**0**	**2 4.7**	**6 14.2**	**18 42.8**	**14 33.3**	**2 4.7**	**0**	**4 9.5**	**8 19.04**	**14 33.3**	**12 28.5**	**4 9.5**	**0.005**

Table 10 compares the patient satisfaction between two groups and it shows there is no significant difference between comfort of patient between the two groups.

Patient satisfaction level is marked as 0, 2, 4, 6, 8 and 10.

In group A 18(42.8) patients marked their comfort level as 6 and only 2 (4.7%) patients had so much discomfort during the process in which they rated 10 that signifies severe pain.

In group P 14(33.3%) patients marked their comfort level as 6 and 4(9.5%) patients rated their level as 10. However there is no statistical significance between the group.

DISCUSSION

Sciatic nerve block is frequently used for anaesthesia or analgesia during lower leg, ankle and foot surgery, and several different proximal approaches to the sciatic nerve have been described in the literature[87] .However, the traditional Labat posterior method is unquestionably the one that is employed the most. However, because to the dense layer of muscles that the stimulating needle must travel through to reach the sciatic nerve, this procedure may be rather uncomfortable for the patient. In individuals with restricted mobility, morbid obesity, spine instability, and hemodynamic instability, both techniques offer benefits and drawbacks. [88] The posterior approach to sciatic nerve block needs the patient to be in sim's position, whereas the anterior approach (Beck) to sciatic nerve was conducted with the patient remaining in the supine position..

The anterior approach to sciatic nerve block under ultrasound guidance has been used in practice, and this shows that it may be used for lower limb surgery just as quickly and effectively posterior route. Compared to landmark-based strategy, ultrasound guided approach may lower chance of femoral artery puncture.

Block quality of anterior (Group A) and posterior (Group P) USG-guided sciatic nerve blocks was evaluated in the current study. Both methods were successful in delivering both intraoperative anaesthetic and postoperative analgesia. Patients

reported similar levels of satisfaction with both strategies, which had similar block lengths. Patients in P group, on other hand, had a 100% success rate, required less time for conducting block, accomplish sensory and motor block, and experienced less problems.

Time required performing block

- In contrast to Ota et al.study, [15] which found that the combined sciatic and femoral block required an execution time of 12 min and 11 min in both groups, mean time needed to perform sciatic block in current study was 6.75 min±1.10 min and 7.44 min±1.00 min in Group P and Group A respectively. The time needed to change transducers and time needed to wrap the nerves with local anaesthesia that was guided by ultrasound might be the cause of the extra time in Group A. It has been discovered that the anterior technique requires more efforts and time than the posterior method. When compared to parathesia and peripheral nerve stimulators, which are more widely used procedures, the use of ultrasonography to execute peripheral nerve blocks is a relatively new technique that is quickly rising in favor.

Comparison of number of attempts to achieve block

Our study did not demonstrate any statistical significance between the groups for number of attempts to perform the block. However number of attempts in group P is less than group A but there was no statistical significance found between both the groups.

Comparison of Onset of Sensory block and Motor Block

Patient of anterior approach has a mean time of 9.53±5.40 min when compared to patient with posterior approach (11.856±7.35) min. Faster onset of sensory block is seen with group A, but this is statistically not significant when compared to group B with a p value of 0.165.

Patient with posterior approach had a mean time of 18.67±7.05 min when compared to patient with posterior approach (17.82±5.70 min). Faster onset of motor block is seen with group P, but this is statistically not significant when compared to group A with a p value of 0.630.Pia di Benedetto et al [78] In a study comparing the new posterior approach to the sciatic nerve block with the traditional posterior approach, it was discovered that there weren't any differences in the final distribution of nerve blockade between patients who underwent the new subgluteus approach and those who underwent the traditional posterior approach regarding onset time of sensory and motor blocks.Our results are correlated when

compared with previous studies by Junichi Ota, which showed that there was no differences in the onset of sensory and motor blockade of the sciatic nerve after the block between two approaches

Comparison of duration of analgesia

It is almost similar in both the groups and there is no statistical significance between the groups with a p value >**0.05.**

Most surgeries below the knee are carried out while under a localized nerve blockade, which barely affects physiology as a whole.

The finding was consistent with that of Buys et al[72], who discovered that blocking the sciatic nerve before its bifurcation required much more time than blocking tibial and common peroneal nerves using ultrasound guidance after they had been divided in popliteal fossa. The nerve there is thinner than in sub-gluteal region, thus they compared bifurcation with block immediately caudate.

The study's results correspond with those of a study by Taboada et al., which showed that lateral popliteal methods took longer to complete anaesthesia for patients getting sciatic nerve blocks than sub-gluteal techniques.[74]

The ultrasound-guided sciatic nerve block in the sub-gluteal area, on the other hand, is one of the more challenging blocks. Despite being large enough (varying in thickness from 1 to 2 cm), it remains phantom-like in its capacity to display

clearly in the ultrasound image. Multiple needle pricks may be required to produce adequate block, and nerve stimulator may be required to ensure needle position. [72]

The same result was observed by Taboada et al. in a different research, and they ascribed it to anatomical variations at two injection sites that can obstruct local anaesthetic diffusion. They believed that the close closeness of the two sciatic nerve trunks at the sub-gluteal area, where they are only divided by a very little amount of adipose tissue, made it simpler for local anaesthetic to disseminate. On t other hand, distance between tibial and common peroneal nerves above popliteal fossa crease varies and might be sufficiently lengthy to make it challenging for local anaesthetic to reach such distance. Additionally, popliteal cavity may include many layers of connective tissue or fat. [75]

We first attributed patient pain during sub-gluteal approach to challenging method, which called changing several trails of needle orientation and therefore longer time to execute block; also incidence of non-blocked regions was higher in sub-gluteal approach.

However, when patients were surveyed after procedure to assess their level of satisfaction, there was no discernible difference between two methods. While more surgeons favoured the sub-gluteal technique because motor block produced

by blocking the sciatic nerve at sub-gluteal area restricted knee flexion and prevented patients from moving the limb, sub-gluteal route made procedure simpler.

For foot and lower limb surgery, a peripheral nerve block is a very efficient and useful technique. Patients at high risk for hemodynamic instability should not undergo central neuroaxial blockade, which causes bilateral blockade and severe sympathectomy. [37,39] Patients at high risk for hemodynamic instability should not undergo central neuroaxial blockade, which causes bilateral blockade and severe sympathectomy.Peripheral nerve block, which provides superior hemodynamic stability because it may be restricted to a localized location without influencing the patient's sympathetic nervous system, is an appropriate approach.[27]

Other procedures for such individuals under regional anesthesia include unilateral spinal or graded epidural anesthesia, but these also have their own drawbacks and risks.[41,42] Although a good option, general anesthesia has its own set of problems.[43]

Peripheral nerve blocks are utilized extensively and precisely for practically all procedures, either intraoperatively or for postoperative analgesia. Various methods for blocking SN are reported in the literature, but Labat's posterior technique is most frequently used.[45] In the posterior approach, the patient must be in a lateral posture, which is uncomfortable for the patient and occasionally unsafe for patients

who are fat or unstable. Additionally, managing and monitoring the patient's airway when they are in a lateral posture presents certain challenges. With Beck's anterior technique, these disadvantages are extremely effectively addressed while the patient is supine.

Few studies have compared the posterior approach to sciatic nerve block with the lateral method, and the posterior technique has produced better outcomes.[46,47] A few outdated research suggested a high failure rate and greater pain with the anterior approach, however it is important to remember that in those early days, investigations were primarily conducted using the paresthesia elicitation technique.

Patient Comfort level

In group A 18 patients marked their comfort level as 6 and only 2 patients had so much discomfort during the process in which they rated 10 that signifies severe pain.

In group P 14 patients marked their comfort level as 6 and 4 patients rated their level as 10. However there is no statistical significance between the groups.

Patient comfort levels in group A were much lower than in group P, possibly as a result of the patient's discomfort from having to go into a lateral posture and hold it

for 15 to 20 minutes. Prior to block, we did not use any sedatives or analgesics in order to accurately analyze block. Although both techniques are unpleasant because to the deep block, we found that patients who were supine were more at ease. The overall effectiveness of both strategies is therefore equal. When compared, the anterior technique increased the duration of analgesia more than the posterior method, although the difference was not statistically significant. Despite obvious markers, the sciatic nerve's placement varies from person to person. Furthermore, when sciatic nerve is inserted deep within the body through the anterior method, block needle must travel a considerable distance, and needle tip might easily deviate from the desired nerve.[11]

By evaluating the success and safety of sciatic and other peripheral nerve blocks using ultrasound guidance, vascular structures may be avoided, and local anesthetic around neural targets may be directly observed. [34, 35]

In his study, Urmey (2010) noted that there were no differences between the two procedures in terms of block success or complication rates. In their meta-analysis, Gelfand et al.[36] made claim that US guided peripheral nerve blocks have a higher success rate than nerve stimulation alone for some specific blocks, including those to the brachial plexus, sciatic nerve, and popliteal nerve.

The study's limitation is that it was not feasible to blind the anaesthetist who did the nerve block (the author), hence the success rate and other variables were checked by a blind observer

SUMMARY

- This study compares anterior and posterior techniques for sciatic nerve blocks in terms of patient comfort, technical complexity, and block quality.
- ASA grade II and III were analyzed and there is no statistical significance found between the group with P value 0.795
- Onset of sensory blockade and motor blockade shows no statistical significance.
- Time taken to perform the block is significantly less in group P than in group A ($p< 0.05*$).
- Patient satisfaction is similar in both groups but there is no statistical significance between the groups.
- Patient comfort levels in group A were much lower than in group P, possibly as a result of the patient's discomfort from having to go into a lateral posture and hold it for 15 to 20 minutes.
- According to our study's findings, the posterior method is simpler than the anterior one, takes less time to complete, and results is greater patient comfort and satisfact

CONCLUSION

Through our study we have come to the conclusion that though efficacy of both the approaches to block sciatic nerve is same, posterior approach is easier than anterior and requires lesser time to perform with better patient comfort and satisfaction.

REFERENCES

1. Need off M, Radford P, Costigan P. Local anesthesia for postoperative pain relief after foot surgery: A prospective clinical trial. Foot Ankle Int. 1995; 16:11–13.

2. WEDEL DJ, BROWN DL, MILLER RD, ed. Anesthesia.3rd ed. New York: Churchill-Livingstone,1990:1407-1437 ; 1990,. p. 1407–1437.

3. Periopreative management. In: Kozak G, editor. Clinical diabetes mellitus. Philadelphia: WB Saunders Co;1982. p 24681 ; 1982,. p. 24681.

4. Vloka JD, Hadzik A. Intensity of current at which sciatic nerve stimulation is achieved is more important factor in determining the quality of nerve block. Anesthesiol. 1998;88:1408–1410.

5. Winni A, Ramamurthy S, Durrani Z, Radonjic R. Plexus blocks for lower extrimities surgery. Anesthesiol Rev. 1974;1(6):11–16.

6. Labat G. Regional Anaesthesia: Its technique and Clinical application. Philadelphia, WB Saunders . 1992;p. 286–291.

7. Labat G. Anterior approach to sciatic nerve block. Anesthesiol. 1963;24:222–224.

8. Munirama S, McLeod G. Ultrasound-guided femoral and sciatic nerve blocks. Contin Educ Anaesth Crit Care Pain. 2013 Aug 1;13:136-40.

9. Ericksen ML, Swenson JD, Pace NL. The anatomic relationship of the sciatic nerve to the lesser trochanter. Implications for anterior sciatic nerve block. Anesth Analg. 2002;95:1071–4.

10. Amin WA, Abou Seada MO, Saeed MF, Mohammed SF, Abdel-Haleem TM, Shabaan EA. Continuous sciatic nerve block: comparative study between the parasacral, lateral, and anterior approaches for lower limb surgery. Middle East J Anesthesiol. 2010;20:695–702.

11. Ota J, Sakura S, Hara K, Saito Y. Ultrasound-guided anterior approach to sciatic nerve block: a comparation with the posterior approach. Anesth Analg. 2009;108:660–5.

12. Prakash AK, Bhardwaj AK, Devi MN, Sridevi NS, Rao PK, Singh G. Sciatic nerve division: a cadaver study in the Indian population and review of the literature. Singap Med J. 2010;5:721–3.

13. Uz A, Apaydin N, Cinar SO, Apan A, Comert B, Tubbs RS, et al. A novel approach sciatic nerve block: cadaveric feasibility study. Surg Radiol Anat. 2010;32:873–8.

14. Schnabel A, Middendorf B, Boschin MG, Gottschalk A, Van Aken H, Zahn PK, et al. Differences of analgesic efficacy and complication rates between ultrasound and nervestimulator guided peripheral nerve catheters: database analysis on patient relevant target parameters. Anesthesist. 2014; 63:825–31.

15. McLeod M, McLeod G. A systematic review and meta-analysis of ultrasound versus electrical stimulation for peripheral nerve location and blockade. Anesth. 2015;70:1084–91.

16. Ota J, Hara K. Ultrasound guided sciatic nerve block. Masui. 2008;57:580–7.

17. Hara K, Sakura S, Yokohowa N. The role of electrical stimulation in ultrasound-guided subgluteal sciatic nerve block: a retrospective study on how response pattern and minimal evoked current affect the resultant blockade. J Anesth. 2014;28:524–31.

18. Viscusi ER. Emerging techniques in the treatment of postoperative pain. American Journal of Health-System Pharmacy2004; 61 (Suppl 1): S11–4.

19. Strakowski JA. Ultrasound-guided peripheral nerve procedures. Physical Medicine and Rehabilitation Clinics. 2016 Aug 1;27(3):687-715.

7. Perlas A, Brull R, Chan VW, McCartney CJ, Nuica A, Abbas S. Ultrasound guidance improves the success of sciatic nerve block at the popliteal fossa. Reg Anesth Pain Med 2008; 33: 259– 65 2.

20. Redborg KE, Antonakakis JG, Beach ML, Chinn CD, Sites BD. Ultrasound improves the success rate of a tibial nerve block at the ankle. Reg Anesth Pain Med 2009; 34: 256–60.

21. Oberndorfer U, Marhofer P, Bosenberg A et al. Ultrasonographic guidance for sciatic and femoral nerve blocks in children. Br J Anaesth 2007; 98: 797– 801.

22. Latzke D, Marhofer P, Zeitlinger M et al. Minimal local anaesthetic volumes for sciatic nerve blockade: evaluation of ED99 in volunteers. Br J Anaesth 2010; 104: 239–44

23. Eichenberger U, Stockli S, Marhofer P et al. Minimal local anesthetic volume for peripheral nerve block: a new ultrasoundguided, nerve dimension-based method. Reg Anesth Pain Med 2009; 34: 242–6

24. Danelli G, Fanelli A, Ghisi D et al. Ultrasound vs nerve stimulation multiple injection technique for posterior popliteal sciatic nerve block. Anaesthesia 2009; 64: 638– 42

25. Yektaş A, Balkan B. Comparison of sciatic nerve block quality achieved using the anterior and posterior approaches: a randomised trial. BMC Anesthesiol. 2019 Dec 13;19(1):225. doi: 10.1186/s12871-019-0898-0.

26. Amin WA, Seada MO, Elkersh MM, Mathai AB, Medekova SO, Husain TA. Comparative study between ultrasound and nerve stimulator guided sciatic nerve

block through the anterior approach. Middle East J Anaesthesiol. 2015 Jun;23(2):185-91.

27. Periopreative management. In: Kozak G, editor. Clinical diabetes mellitus. Philadelphia: WB Saunders Co;1982. p 24681 198224681

28. Beck GP: Anterior approach to sciatic nerve block.Anesthesiology 1963;24:222–4.

29. Greengrass R, Steele S, Moretti G, Grant S, Klein S, Nielson K, Peripheral Nerve Blocks, Text Book Of Regional Anaesthesia P.Prithviraj, Churchil Livingstone, U.S.A,2003,p 393-464.

30. Macrae W.A, Coventry D.A. Lower Limb Blocks, Principles & practice of regional anesthesia Wildsmith.J.A.W, Armitage E.N, McClure J.H 3rd ed.Churchi Livingstone, Edinberg, London,2003

31. Steur RJ. Combined sciatic and femoral nerve block with a one-needle/one-point injection technique. Techniques in Regional Anesthesia and Pain Management 2002;6:128–30. https://doi.org/10.1053/trap.2002.123506.

32. Pandin P, Vancutsem N, Salengros JC, Huybrechts I, Vandesteene A. The anterior combined approach via a single skin injection site allows lower limb anesthesia in supine patients. Canadian Journal of Anesthesia/Journal Canadien d'anesthésie 2003;50:801–4. https://doi.org/10.1007/bf03019375.

33. Uz A, Apaydin N, Cinar SO, Apan A, Comert B, Tubbs RS, et al. A novel approach for anterior sciatic nerve block: cadaveric feasibility study. Surgical and Radiologic Anatomy 2010;32:873–8. https://doi.org/10.1007/s00276-010-0642-4.

34. Vloka JD, Hadžić A, April E, Thys DM. Anterior Approach to the Sciatic Nerve Block: The Effects of Leg Rotation. Anesthesia & Analgesia 2001;92:460–2. https://doi.org/10.1213/00000539-200102000-00034.

35. Gray AT, Collins AB, Schafhalter-Zoppoth I. Sciatic Nerve Block in a Child: A Sonographic Approach. Anesthesia & Analgesia 2003:1300–2. https://doi.org/10.1213/01.ane.0000086726.00205.30.

36. Gelfand HF, Pierre JP , Ouanes. Analgesic efficacy of ultrasound-guided regional anesthesia: a meta-analysis. J Clin Anest, 23 (2001), pp. 90-96

37. KLEIN S, PIETROBON R, NIELSEN K, STEELE S, WARNER D, MOYLAN J, et al. Paravertebral somatic nerve block compared with peripheral nerve blocks for outpatient inguinal herniorrhaphy. Regional Anesthesia and Pain Medicine 2002;27:476–80. https://doi.org/10.1053/rapm.2002.35147.

38. Paqueron X. The phenomenology of body image distortions induced by regional anaesthesia. Brain 2003;126:702–12. https://doi.org/10.1093/brain/awg063.

39. Bradley A. Principles and Practice of Surgery. 3rd ed. A. P. M. Forrest, D. C. Carter and I. B. Macleod (eds). 240 × 188 mm. Pp. 642. Illustrated. 1995. Edinburgh: Churchill Livingstone. £30. British Journal of Surgery 1995;82:1581–1581. https://doi.org/10.1002/bjs.1800821144.

40. Kaufman JL, Stark K, Shah DM, Chang BB, Koslow AR, Leather RP. Local Anesthesia for Surgery on the Foot: Efficacy in the Ischemic or Diabetic Extremity. Annals of Vascular Surgery 1991;5:354–8. https://doi.org/10.1007/bf02015296.

41. Yeager MP, Glass DD, Neff RK, Brinck-Johnsen T. Epidural Anesthesia and Analgesia in High-risk Surgical Patients. Anesthesiology 1987;66:729–36. https://doi.org/10.1097/00000542-198706000-00004.

42 . Horlocker TT, McGregor DG, Matsushige DK, Schroeder DR, Besse JA. A Retrospective Review of 4767 Consecutive Spinal Anesthetics. Anesthesia & Analgesia 1997;84:578–84. https://doi.org/10.1213/00000539-199703000-00021.

43. AROMAA U, LAHDENSUU M, COZANITIS DA. Severe complications associated with epidural and spinal anaesthesias in Finland 1987-1993 A study based on patient insurance claims. Acta Anaesthesiologica Scandinavica 1997;41:445–52. https://doi.org/10.1111/j.1399-6576.1997.tb04722.x.

44. Fanelli G, Casati A, Garancini P, Torri G. Nerve Stimulator and Multiple Injection Technique for Upper and Lower Limb Blockade. Anesthesia & Analgesia 1999;88:847–52. https://doi.org/10.1213/00000539-199904000-00031.

45. Chelly JE. Sciatic nerve block. Techniques in Regional Anesthesia and Pain Management 2003;7:18–25. https://doi.org/10.1053/trap.2003.123521.

46. Palaniappan T, Vani S, Ravikumar MS. Comparison of lateral versus posterior approach of poplteal nerve block for diabetic foot surgeriesIndian Jr Anaesth2006504262266

47. Manuel TJ Rodriguez JA. Sciatic nerve block via posterior approach is more efficient than lateral popliteal approach: A prospective randomised double blind technique Aeasthesiol20041011138142

48. Gaertner E, Fouche E, Choquet O, Hadzic A, Vloka JD. Sciatic nerve block. In: Hadzic A, ed. Textbook of regional anesthesia and acute pain management. New York: McGraw-Hill companies, 2007:517–32

49. Raj PP, Parks RI, Watson TD, Jenkins MT. A new single-position supine approach to sciatic-femoral nerve block. Anesth Analg 1975; 54: 489–93.

50. Chelly JE, Delauney L. A new anterior approach to the sciatic nerve block. Anesthesiology 1999; 91: 1655–60.

51. .Davis D, Vasudevan A. Sciatica. [Updated 2019 Feb 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507908/

52.Davis D, Vasudevan A. Sciatica. [Updated 2019 Feb 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507908/

53.Barral J, Croibier A. Manual Therapy for the Peripheral Nerves. Elsevier Health Sciences; 2007.

54.Ryan MM, Jones HR Jr. Mononeuropathies. In: Neuromuscular Disorders of Infancy, Childhood, and Adolescence. Elsevier; 2015:243-273. doi:10.1016/b978-0-12-417044-5.00014-7

55.Ryan MM, Jones HR Jr. Mononeuropathies. In: Neuromuscular Disorders of Infancy, Childhood, and Adolescence. Elsevier; 2015:243-273. doi:10.1016/b978-0-12-417044-5.00014-7

56. Rydevik B. Ischias och diskbråck. Aktuellt om patofysiologi och smärtmekanismer [Sciatica and herniated disk. Current aspects of pathophysiology and pain mechanisms]. Nord Med. 1994;109(3):74-6, 80. Swedish. PMID: 8139899.

57. Covino BG. Local Anesthetics. Anesthesia & Analgesia 1978;57:155???156. https://doi.org/10.1213/00000539-197801000-00053.

58. Spector RG. Book Reviews: Handbook of Experimental Pharmacology, vol 81. Local Anesthetics. Edited by G. R. Strichartz, Springer-Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, 1987. 292 pp., DM 280. Human Toxicology 1987;6:445–445. https://doi.org/10.1177/096032718700600517.

59. WILDSMITH JAW. PERIPHERAL NERVE AND LOCAL ANAESTHETIC DRUGS. British Journal of Anaesthesia 1986;58:692–700. https://doi.org/10.1093/bja/58.7.692.

60. NARAHASHI T, YAMADA M, FRAZIER DT. Cationic Forms of Local Anaesthetics block Action Potentials from Inside the Nerve Membrane. Nature 1969;223:748–9. https://doi.org/10.1038/223748a0.

61. Frazier DT, Narahashi T, Moore JW. Hemicholinium-3: Noncholinergic Effects on Squid Axons. Science 1969;163:820–1. https://doi.org/10.1126/science.163.3869.820.

62. D.T. Frazier, T. Narahashi, M. Yamada, J. Pharm. Exp. Ther. 171 (1970) 45.

63. Strichartz GR. The Inhibition of Sodium Currents in Myelinated Nerve by Quaternary Derivatives of Lidocaine. Journal of General Physiology 1973;62:37–57.

64. Cahalan MD, Almers W. Block of sodium conductance and gating current in squid giant axons poisoned with quaternary strychnine. Biophysical Journal 1979;27:57–73. https://doi.org/10.1016/s0006-3495(79)85202-9.

65. RAVINDRAN RS, BOND VK, TASCH MD, GUPTA CD, LUERSSEN TG, Bridenbaugh LD. Prolonged Neural Blokade following Regional Analgesia with 2-Chloroprocaine. Survey of Anesthesiology 1981;25:176. https://doi.org/10.1097/00132586-198106000-00052.

66. Reisner LS, Hochman BN, Plumer MH. Persistent Neurologic Deficit and Adhesive Arachnoiditis Following Intrathecal 2-Chloroprocaine Injection. Obstetric Anesthesia Digest 1981;1:19. https://doi.org/10.1097/00132582-198103000-00020.

67. Sokoll MD, Sonesson B, Thesleff S. Denervation changes produced in an innervated skeletal muscle by long-continued treatment with a local anesthetic. European Journal of Pharmacology 1968;4:179–87. https://doi.org/10.1016/0014-2999(68)90175-1.

68. ADAMS JH, MASTRI AR, EICHOLZER AW, KILPATRICK G. Morphologic Effects of Intrathecal Etidocaine and Tetracaine on the Rabbit Spinal Cord. Anesthesia & Analgesia 1974;53:904–8. https://doi.org/10.1213/00000539-197453060-00018.

69. Boljka M, Kolar G, Vidensek J. Toxic side effects of local anaesthetics on the human cornea. British Journal of Ophthalmology 1994;78:386–9. https://doi.org/10.1136/bjo.78.5.386.

70. Bisla K, Tanelian DL, Investigative Opthalmology & Visual Science 2017;58:3029. https://doi.org/10.1167/iovs.16-21321a. 33 (1992) 3029-3033.

71. Covino BG, Marx GF, Finster, Zsigmond EK. Anesth. Analg. 59 (1980) 399-400.

72. Karmakar MK, Kwok WH, Ho AM, Tsang K, Chui PT, Gin T. Ultrasound-guided sciatic nerve block: Description of a new approach at the subgluteal space. Br J Anaesth 2007; 98(3): 390-5.

73. Buys MJ, Arndt CD, Vagh F, Hoard A, Gerstein N. Ultrasound-guided sciatic nerve block in the popliteal fossa using a lateral approach: Onset time comparing separate tibial and common peroneal nerve injections versus injecting proximal to the bifurcation. Anesth Analg 2010; 110(2): 635-7.

74. Taboada M, Rodríguez J, ÁLvarez J, Cortés J, Gude F, Atanassoff PG. Sciatic nerve block via posterior Labat approach is more efficient than lateral popliteal approach using a double-injection technique: A prospective, randomized comparison. Anesthesiology 2004; 101(1): 138-42.

75. Taboada M, Álvarez J, Cortés J, et al. The effects of three different approaches on the onset time of sciatic nerve blocks with 0.75% ropivacaine. Anesth Analg 2004; 98(1): 242-7.

76. Denise J. Wedel, Terese T. Horlocker, chapter 52 – Nerve Blocks, Miller"s Anesthesia, Lars I. Eriksson. [et al.].7th ed. Churchil Livingstone, U.S.A, 2010,p 1639.

77. Dalens B,Tanguy A, Vanneuville G. Sciatic nerve blocks in children: comparison of the posterior, anterior, and lateral approaches in 180 pediatric patients.Anesth Analg 1990;70:131–7.

78. di Benedetto P, Bertini L, Casati A, Borghi B, Albertin A, Fanelli G. A New Posterior Approach to the Sciatic Nerve Block: A Prospective, Randomized Comparison with the Classic Posterior Approach. Anesthesia & Analgesia 2001;93:1040–4. https://doi.org/10.1097/00000539-200110000-00049.

79. Ultrasound-Guided Sciatic Nerve Block - NYSORA. NYSORA 2018. https://www.nysora.com/topics/regional-anesthesia-for-specific-surgical-

procedures/lower-extremity-regional-anesthesia-for-specific-surgical-procedures/foot-and-anckle/ultrasound-guided-sciatic-nerve-block-2/

80. Sciatic Nerve Block - Landmarks and Nerve Stimulator Technique - NYSORA. NYSORA 2018. https://www.nysora.com/techniques/lower-extremity/sciatic-nerve-block/

81. Adjunct medications for peripheral and neuraxial anesthesia. Adjunct Medications for Peripheral and Neuraxial Anesthesia - ScienceDirect 2018. https://www.sciencedirect.com/science/article/pii/S1521689618300582

82. Local Anesthetics: Review of Pharmacological Considerations | American Dental Society of Anesthesiology. Local Anesthetics: Review of Pharmacological Considerations | American Dental Society of Anesthesiology n.d. https://cdeworld.com/courses/20191-local-anesthetics-review-of-pharmacological-considerations

83. Press D, El-Boghdadly K, Pawa A, Chin KJ. Local anesthetic systemic toxicity: current perspectives | LRA. Local Anesthetic Systemic Toxicity: Current Perspectives | LRA n.d. https://www.dovepress.com/local-anesthetic-systemic-toxicity-current-perspectives-peer-reviewed-fulltext-article-LRA

84. Neurologic Exam: Sensory Exam. Neurologic Exam: Sensory Exam n.d..https://learn.chm.msu.edu/neuroexam/content/sensory_exam/sensory.html

85. he Pinprick Test: Key Considerations in Execution of Skin... : Plastic and Reconstructive Surgery – Global Open. LWW n.d. https://journals.lww.com/prsgo/Fulltext/2019/09000/The_Pinprick_Test___Key_Considerations_in_Execution.43.aspx

86. Bromage Scale | PDF | Childbirth | Anesthesia. Scribd n.d. https://www.scribd.com/document/357974338/Bromage-Scale

87. di Benedetto P, Bertini L, Casati A, Borghi B, Albertin A, Fanelli G. A New Posterior Approach to the Sciatic Nerve Block: A Prospective, Randomized Comparison with the Classic Posterior Approach. Anesthesia & Analgesia 2001;93:1040–4. https://doi.org/10.1097/00000539-200110000-00049.

88. Posterior subgluteal approach to block the sciatic nerve:... : European Journal of Anaesthesiology | EJA. LWW n.d. https://journals.lww.com/ejanaesthesiology/Fulltext/2002/09000/Posterior_subgluteal_approach_to_block_the_sciatic.11.aspx

PROFORMA

STUDY: "COMPARITIVE STUDY OF ULTRASOUND GUIDED ANTERIOR AND POSTERIOR APPROACHES TO SCIATIC NERVE BLOCK FOR LOWER LIMB SURGERIES"

Name:

Age: Sex:

I.P. Number:

Unit:

Date of Admission:

Date of Surgery:

Consent: Yes/No

Comorbidities;

Diagnosis :

Investigations;

Surgery :

A.S.A. physical status: I / II /III

Mallampati Grading –

Mouth opening -

Height :

Weight : B.M.I.:

General Physical Examination :

Pulse rate :

B.P.:

CVS :

R.S.:

Any other significant findings :

Spinal column:-

Group assigned: A ☐ P ☐

Position :

Time is taken to perform block-

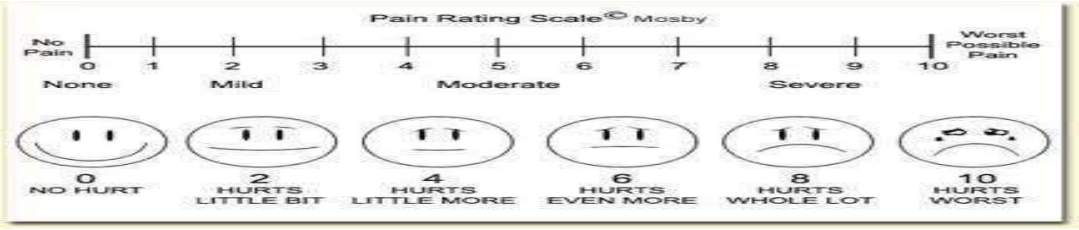
Total number of needle insertion attempts-

Time is taken for sensory block onset-

Time is taken to motor block onset-

Duration of analgesia/anaesthesia-

The comfort of patient-



SENSORY BLOCK

TIME PIN PRICK

Min	0	1	2
2			
4			
6			
8			
10			
15			

MOTOBLOCK

TIME BROMAGE SCALE

Min	0	1	2
2			
4			
6			
8			
10			
15			

PROFORMA FOR ASSESSMENT OF ANTERIOR AND POSTERIOR APPROACHES

s.no	**Age**	**sex**	**Ht**	**Wt**	**A.S.A.**	**Time to perform block**	**No.of attempts**	**Sensory blockade**	**Motor blockade**	**Duration of analgesia**

STUDY SUBJECT CONSENT STATEMENT

I confirm that **Dr. BUDATHA SREENIJA** has explained the purpose of this research, the study procedure that I will undergo, and the possible discomforts and benefits that I may experience, in my own language. I have explained all the above in detail in my own language, and I understand the same. Therefore, I agree to give my consent to participate as a subject in this research project.

_____ _____

(Participant) Date

_____ _____

(Witness to above signature) Date

MASTER CHART (POSTERIOR GROUP)

S.NO	group	name	age	sex	consen	ASA	M.G	MOUTI	Ht	Wt	PULSE	BP	CVS	RS	ANY O	SPINAI	taken to perfo rm block	no. Of attem pts	seaso rgblo ckade (min)	motor block ade(m in)	durati on of analg esia(h r)	comfo rt of the patien t
1	P	XX	45	M	YES	II	2	3	146	60	90	155/90	NORMA	NORMA	NO	NORMA	6	3	10	15	4	2
2	P	XX	50	M	YES	II	2	2	150	65	72	120/80	NORMA	NORMA	NO	NORMA	6	3	15	12	3	4
3	P	XX	72	M	YES	III	3	3	146	72	82	142/70	NORMA	NORMA	NO	NORMA	7	2	12	20	4	6
4	P	XX	55	M	YES	II	2	2	152	62	83	150/70	NORMA	ABNOR	NO	ABNOR	7	3	10	15	4	8
5	P	XX	62	M	YES	II	2	2	156	68	85	155/90	NORMA	NORMA	YES	NORMA	6	2	8	15	5	10
6	P	XX	27	M	YES	II	3	2	170	69	90	120/80	NORMA	NORMA	NO	NORMA	10	2	10	10	5	6
7	P	XX	30	M	YES	II	3	2	152	50	82	142/70	NORMA	NORMA	NO	NORMA	6	2	15	20	4	6
8	P	XX	45	M	YES	II	3	2	149	62	86	150/70	ABNOR	NORMA	YES	NORMA	6	2	10	12	4	6
9	P	XX	45	M	YES	II	3	2	150	63	76	180/100	NORMA	NORMA	NO	NORMA	12	2	15	10	4.5	6
10	P	XX	50	M	YES	III	2	3	156	64	79	180/100	NORMA	ABNOR	NO	ABNOR	7	2	12	8	5	8
11	P	XX	59	M	YES	II	2	3	157	78	80	155/90	NORMA	NORMA	YES	NORMA	8	2	15	10	5.5	8
13	P	XX	75	M	YES	II	2	2	161	80	79	142/70	NORMA	NORMA	NO	NORMA	9	3	15	10	4	4
14	P	XX	72	M	YES	II	2	2	162	50	82	150/70	ABNOR	NORMA	NO	NORMA	5	3	15	15	4	4
15	P	XX	71	M	YES	II	2	2	163	53	90	155/90	NORMA	NORMA	YES	NORMA	6	3	10	12	4	4
16	P	XX	70	M	YES	II	2	2	164	56	72	120/80	NORMA	ABNOR	NO	ABNOR	6	3	20	15	3	2
17	P	XX	66	M	YES	II	2	2	165	60	82	142/70	NORMA	NORMA	NO	NORMA	7	3	12	10	5.5	4
18	P	XX	42	M	YES	II	2	3	170	62	83	150/70	NORMA	NORMA	YES	NORMA	7	3	10	10	6	6
19	P	XX	45	M	YES	II	2	2	172	65	85	180/100	NORMA	NORMA	YES	NORMA	7	3	8	10	4	8
20	P	XX	28	M	YES	II	3	1	173	80	90	180/100	ABNOR	NORMA	NO	NORMA	6	3	10	15	4	10
21	P	XX	26	M	YES	II	3	2	146	60	90	155/90	NORMA	NORMA	NO	NORMA	6	3	10	30	4	6
22	P	XX	52	M	YES	II	3	1	150	65	72	180/100	NORMA	ABNOR	YES	ABNOR	6	3	10	10	3	6
23	P	XX	53	M	YES	II	2	1	146	72	82	142/70	NORMA	NORMA	NO	NORMA	7	3	15	8	4	6
24	P	XX	55	M	YES	II	2	1	152	62	83	155/90	NORMA	NORMA	NO	NORMA	8	3	12	15	4	6
25	P	XX	45	F	YES	II	2	2	156	68	85	120/80	NORMA	NORMA	YES	NORMA	5	2	15	10	5	8
26	P	XX	50	F	YES	II	3	3	170	69	90	142/70	ABNOR	NORMA	YES	NORMA	6	2	20	30	5	8
27	P	XX	72	F	YES	III	2	2	152	50	72	150/70	NORMA	NORMA	NO	NORMA	6	2	15	15	4	8
28	P	XX	55	F	YES	II	2	3	149	62	75	155/90	NORMA	ABNOR	NO	ABNOR	6	3	15	12	4	4
29	P	XX	62	F	YES	II	2	2	150	63	90	120/80	NORMA	NORMA	YES	NORMA	6	3	10	15	5	4
30	P	XX	30	F	YES	II	1	3	156	64	82	142/70	NORMA	NORMA	YES	NORMA	7	3	15	20	4	4
31	P	XX	30	F	YES	II	2	2	157	78	86	150/70	NORMA	NORMA	NO	NORMA	8	3	12	15	3	8
32	P	XX	45	F	YES	III	2	3	180	79	76	180/100	ABNOR	NORMA	NO	NORMA	9	3	10	10	4	10
33	P	XX	45	F	YES	II	2	2	161	80	79	180/100	NORMA	NORMA	NO	NORMA	12	3	8	8	4	6
34	P	XX	50	F	YES	II	2	3	162	50	80	155/90	NORMA	ABNOR	NO	ABNOR	6	3	10	10	5	6
35	P	XX	59	F	YES	II	2	2	163	53	65	120/80	NORMA	NORMA	YES	NORMA	6	3	10	10	5	6
36	P	XX	56	F	YES	II	2	2	164	56	79	142/70	NORMA	NORMA	YES	NORMA	6	3	10	10	4	6
37	P	XX	75	F	YES	II	3	2	165	60	82	155/90	NORMA	NORMA	NO	NORMA	6	3	15	15	4	8
38	P	XX	72	F	YES	II	2	2	170	62	90	120/80	ABNOR	NORMA	NO	NORMA	12	3	12	12	4	8
39	P	XX	71	F	YES	III	2	2	172	65	82	142/70	NORMA	NORMA	YES	NORMA	6	3	15	15	3	2
40	P	XX	70	F	YES	II	3	2	173	80	86	150/70	NORMA	ABNOR	NO	ABNOR	6	2	10	20	4	2
41	P	XX	66	F	YES	III	3	3	146	64	90	155/90	NORMA	NORMA	NO	NORMA	12	2	10	15	4	8
42	P	XX	42	F	YES	II	3	3	150	78	72	120/80	NORMA	NORMA	YES	NORMA	7	2	10	15	5	10

MASTER CHART(ANTERIOR APPROACH)

S.NO	GROUI	NAME	AGE	SEX	CONSE	ASA	MALLA	MOUTI	HEIGHT	WEIGH	PULSE	BP	CVS	RS	ANY O	SPINAI	no of attem pts	seaso ry block ade(m in)	motor block ade(m in)	dura tion of analg esia(h	comfo rt of pt	Tltime taken to perfo rm the
1	A	XX	45	M	YES	2	3	3	146	79	82	142/70	NORMA	NORMA	YES	NORMA	3	15	10	5	6	6
2	A	XX	28	M	YES	2	2	2	152	80	83	150/70	ABNOR	NORMA	NO	NORMA	3	30	15	4	6	7
3	A	XX	26	M	YES	2	2	2	156	50	85	180/100	NORMA	NORMA	NO	NORMA	3	10	12	4	6	8
4	A	XX	52	M	YES	2	2	2	170	53	90	180/100	NORMA	ABNOR	NO	ABNOR	3	8	10	4.5	6	5
5	A	XX	53	M	YES	2	2	2	152	56	79	155/90	NORMA	NORMA	NO	NORMA	3	15	30	5	8	6
6	A	XX	55	M	YES	2	2	2	149	60	80	120/80	NORMA	NORMA	NO	NORMA	3	10	10	5.5	8	10
7	A	XX	45	M	YES	2	2	3	150	62	65	142/70	NORMA	NORMA	NO	NORMA	3	30	10	6	6	10
8	A	XX	50	M	YES	2	2	2	156	65	79	150/70	NORMA	NORMA	YES	NORMA	2	15	10	4	6	6
9	A	XX	72	M	YES	3	2	1	157	80	82	155/90	NORMA	NORMA	NO	NORMA	3	12	15	4	6	7
10	A	XX	55	M	YES	3	2	2	180	69	90	120/80	NORMA	ABNOR	NO	ABNOR	2	15	12	4	8	8
11	A	XX	62	M	YES	3	2	1	161	50	82	142/70	NORMA	NORMA	YES	NORMA	2	20	20	3	8	9
12	A	XX	30	M	YES	3	3	1	162	62	86	150/70	NORMA	NORMA	NO	NORMA	2	15	15	5.5	8	6
13	A	XX	30	M	YES	2	3	1	163	63	90	180/100	NORMA	NORMA	NO	NORMA	2	15	15	6	4	6
14	A	XX	45	M	YES	3	3	2	164	64	85	180/100	ABNOR	NORMA	YES	NORMA	2	10	10	4	4	6
15	A	XX	45	M	YES	2	2	3	165	78	86	155/90	NORMA	NORMA	YES	NORMA	2	15	20	4	4	6
16	A	XX	50	M	YES	2	2	2	170	79	90	120/80	NORMA	ABNOR	NO	ABNOR	3	12	12	4	8	11
17	A	XX	66	M	YES	2	2	3	172	80	82	142/70	NORMA	NORMA	NO	NORMA	3	10	10	3	10	6
18	A	XX	56	M	YES	2	3	2	173	50	86	155/90	NORMA	NORMA	YES	NORMA	3	8	8	4	6	6
19	A	XX	75	M	YES	3	2	3	146	53	76	120/80	NORMA	NORMA	NO	NORMA	3	10	10	4	6	12
20	A	XX	72	M	YES	2	2	3	150	56	79	142/70	ABNOR	NORMA	NO	NORMA	3	10	10	4	6	7
21	A	XX	71	M	YES	2	2	2	146	60	80	150/70	NORMA	NORMA	YES	NORMA	3	10	10	3	6	8
22	A	XX	70	M	YES	2	1	3	152	62	65	155/90	NORMA	ABNOR	YES	ABNOR	3	15	15	4	8	9
23	A	XX	66	M	YES	2	2	2	156	65	79	120/80	NORMA	NORMA	NO	NORMA	3	12	12	4	8	5
24	A	XX	42	M	YES	2	2	2	170	60	82	142/70	NORMA	NORMA	NO	NORMA	3	15	15	5	2	6
25	A	XX	45	M	YES	2	2	2	152	62	90	150/70	NORMA	NORMA	YES	NORMA	3	20	10	5	2	6
26	A	XX	28	M	YES	3	2	2	149	65	82	180/100	ABNOR	NORMA	NO	NORMA	3	15	10	4	8	10
27	A	XX	26	F	YES	2	2	2	150	80	86	180/100	NORMA	NORMA	NO	NORMA	3	15	10	4	6	11
28	A	XX	52	F	YES	3	2	2	156	64	90	155/90	NORMA	ABNOR	YES	ABNOR	2	10	15	4.5	6	12
29	A	XX	53	F	YES	2	3	3	157	78	82	120/80	NORMA	NORMA	YES	NORMA	2	15	30	5	6	6
30	A	XX	55	F	YES	2	2	3	180	79	86	142/70	NORMA	NORMA	NO	NORMA	2	12	10	5.5	8	6
31	A	XX	45	F	YES	2	2	3	161	80	76	155/90	NORMA	NORMA	NO	NORMA	3	10	8	6	8	6
32	A	XX	50	F	YES	2	3	2	162	50	79	120/80	ABNOR	NORMA	YES	NORMA	3	30	15	4	8	7
33	A	XX	72	F	YES	2	3	2	163	53	80	142/70	NORMA	NORMA	YES	NORMA	3	10	10	4	4	8
34	A	XX	55	F	YES	2	3	2	164	56	65	150/70	NORMA	ABNOR	NO	ABNOR	3	10	30	4	4	5
35	A	XX	62	F	YES	2	3	2	165	50	79	155/90	NORMA	NORMA	NO	NORMA	3	10	15	3	4	6
36	A	XX	66	F	YES	2	2	2	170	62	82	120/80	NORMA	NORMA	NO	NORMA	3	15	12	5.5	8	6
37	A	XX	30	F	YES	2	2	3	172	63	90	142/70	NORMA	NORMA	NO	NORMA	3	12	15	6	10	9
38	A	XX	45	F	YES	3	2	2	173	64	82	150/70	ABNOR	NORMA	YES	NORMA	3	15	20	4	6	10
39	A	XX	45	F	YES	3	2	1	146	78	86	180/100	NORMA	NORMA	YES	NORMA	3	10	15	4	6	12
40	A	XX	50	F	YES	3	2	2	150	79	86	180/100	NORMA	ABNOR	NO	ABNOR	3	10	10	4	6	8
41	A	XX	59	F	YES	3	2	1	146	80	76	155/90	NORMA	NORMA	NO	NORMA	3	15	8	3	6	9

IEC/NO- 09/2021
22-01-2021

B.L.D.E. (DEEMED TO BE UNIVERSITY)

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: Comparative study of ultrasound guided anterior and posterior approaches to sciatic nerve block for lower limb surgeries.

Name of PG student: Dr Budatha Sreenija Department of Anaesthesiology

Name of Guide/Co-investigator: Dr D G Talikoti Professor of Anaesthesiology

DR .S.V.PATIL
CHAIRMAN, IEC
Institutional Ethical Committee
B L D E (Deemed to be University)
Shri B.M. Patil Medical College,
VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.