

## SCIATIC NERVE BLOCK: LATERAL APPROACH WITH THE PATIENT SUPINE

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SCIATIC nerve block, alone or in combination with femoral, obturator, and lateral femoral cutaneous nerve blocks has been employed for surgical procedures on the lower extremities. It also has therapeutic applications in sciatica and peripheral vascular insufficiency.

The usual technique is the one described by Labat<sup>1</sup> in which the nerve is blocked posteriorly at its emergence from the pelvis. Other approaches have been described by Pitkin.<sup>2</sup> In the latter techniques the nerve is blocked either at the mid-point between the greater trochanter of the femur and the ischial tuberosity which is slightly caudad to the blocking site advocated by Labat, or at a point caudad to the gluteal fold where the nerve enters the thigh. All of these techniques employ either the modified Sims' or prone position. In practice, however, these positions are frequently inconvenient or incompatible with patient comfort.

To avoid the disadvantages associated with changing patient position, a technique was tried utilizing a lateral approach with the patient supine. It has been used in 30 cases. The only previous description of the lateral approach is a brief mention by Molesworth.<sup>3</sup> In his technique, with the patient supine, a needle was introduced laterally posterior to the greater trochanter until the nerve was reached.

### ANATOMY

The anatomical relations of the sciatic nerve have been studied in fifteen cadavers. This nerve is the largest in the body measuring 1.5 to 2.0 cm. in width as it leaves the pelvis. It is compressed antero-posteriorly so that its thickness is about 0.3 to 0.5 cm. After leaving the pelvis between the piriformis and superior gemellus muscles, the greater sciatic nerve ( $L_{4-5}$ ,  $S_{1-3}$ ) passes through a hollow between the greater trochanter of the femur and the

ischial tuberosity. Here it passes over the gemelli, obturator internus, and quadratus femoris muscles and enters the thigh beneath the gluteus maximus muscles (fig. 1).

The posterior femoral cutaneous nerve ( $S_{1-3}$ ) is usually in close proximity and posterior to the greater sciatic nerve until they enter the thigh. Variations in which it separates sooner may account for unsatisfactory analgesia encountered when the surgical procedure involves the posterior aspect of the thigh which is supplied by this nerve.

The inferior gluteal artery leaves the pelvis with the sciatic nerve below the piriformis muscle, and immediately divides into diverging branches one of which, the sciatic artery, accompanies the greater sciatic nerve on its posterior aspect. The inferior gluteal veins accompany the inferior gluteal artery. These blood vessels are small in the region between the greater trochanter and the ischial tuberosity where the nerve is to be blocked in the lateral method. The space between nerves and ischium is usually less than one centimeter in adults.

### TECHNIQUE

The patient is placed supine with a small pillow beneath both knees. The pillow seems to facilitate the block because it moves the greater trochanter slightly ventrally providing more space for introduction of the needle. The patient is instructed to inform the anesthetist when he feels paresthesias to the foot.

A wide area around the greater trochanter of the thigh is aseptically prepared and draped. The anesthetist sits on a stool and palpates the greater trochanter. A line is drawn across the posterior border of the greater trochanter parallel to the shaft of the femur. Another line is drawn perpendicular to this at 1.5 to 2 cm. distal to the superior border of the greater trochanter. At the junction of these lines a skin wheal is made with a local anesthetic. A 15 cm., 20 gauge needle with a stylet is inserted through the wheal perpendicularly to the axis of the body and about 10 degrees ven-

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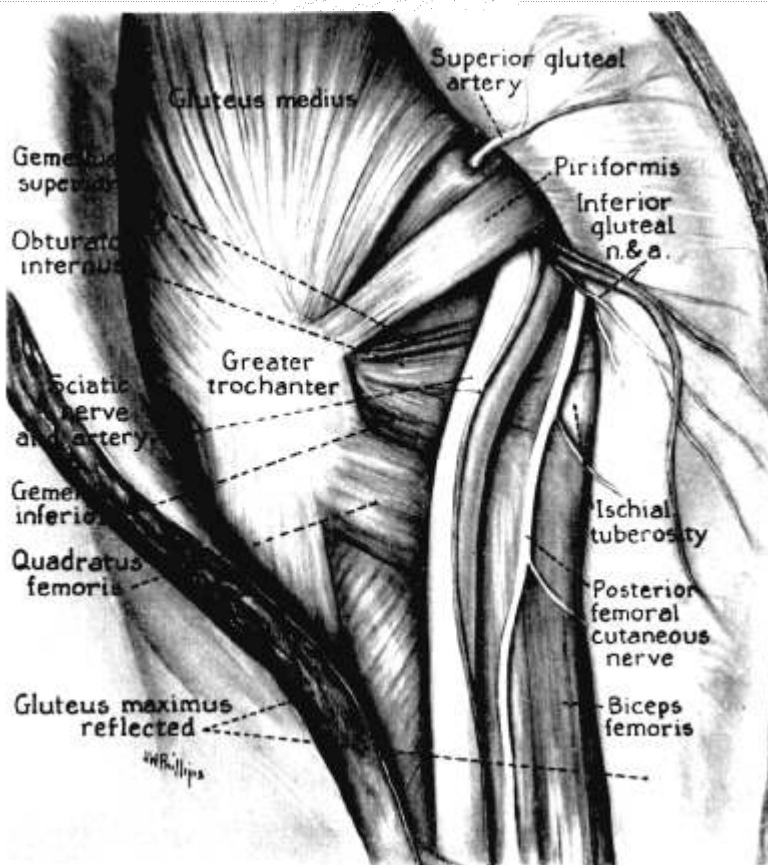


FIG. 1. Anatomical relationships of left sciatic nerve, posterior view.

trally, *i.e.*, with the point of the needle directed slightly toward the ceiling of the room. The needle is advanced slowly until paresthesia is elicited, usually at a depth of 7 to 15 cm. depending upon the patient's size (fig. 2). The greater trochanter may be encountered. By depressing the shaft of the needle and the tissues downward it can be made to slide off the posterior edge of the bone and then advanced. After the nerve is reached, a 10 ml. syringe filled with local anesthetic is attached to the needle and after careful aspiration with the bevel of the needle in several planes, 10 ml. of anesthetic is injected and 10 ml. more is injected while moving the needle point in and out slightly to assure depositing the drug in the proper plane. Local anesthetics used were 1.0–2.0 per cent lidocaine (Xylocaine), 0.15 per cent tetracaine (Pontocaine), or 1.0–3.0 per cent 2-chlorprocaine (Nesacaine), either

alone or in combinations, or with epinephrine, according to surgical requirements.

If paresthesia is not elicited before the ischium is reached, repeat the procedure with different angles of the needle. By increasing and decreasing the angle both upward and downward, paresthesia to the foot, the heel or the toes will occur in the majority of cases. If unable to produce paresthesia after repeated tries, tissues around the nerve are "flooded" with anesthetic by varying the depth as well as the angle of the needle.

#### RESULTS

The lateral method of sciatic nerve block has been employed alone or in combination with other nerve blocks in 30 patients for surgical procedures. For the purpose of the study the lateral approach was used for even those patients in whom the posterior method could

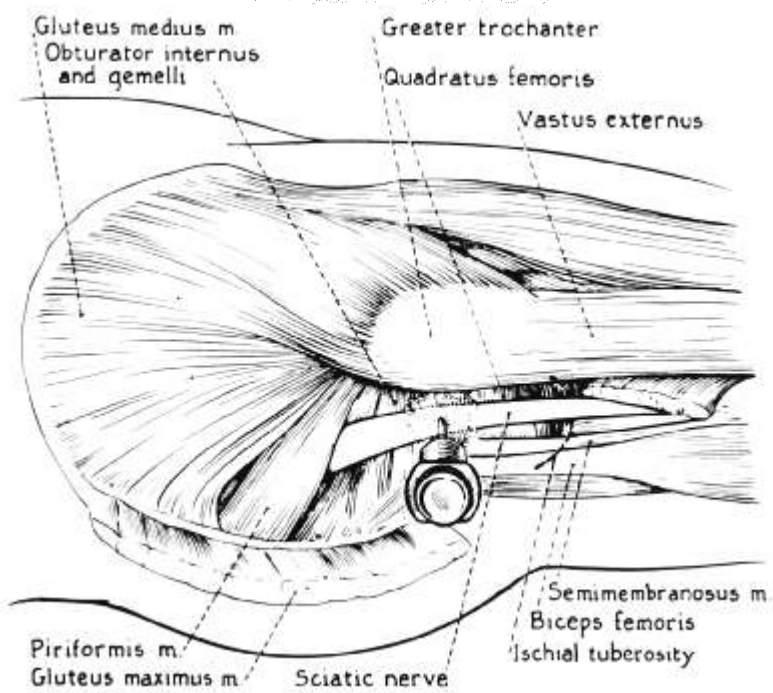


FIG. 2. Sketch of lateral approach to right sciatic nerve.

have been used. The results were compared with those of the last 30 cases in this institution in which the classical posterior approach was employed. No effort will be made to compare the results of these series with those reported by others since the criteria by which results are interpreted may differ. Blocks were done in most of the cases by the author or by anesthesia residents under supervision. The data are tabulated in table 1. Analgesia was

considered satisfactory for the surgical procedures if no supplementation was required or if supplementation with barbiturates and/or meperidine was used only to abolish the apprehension or discomfort caused by remaining in a fixed position for a long period of time. If little or no analgesia followed the block, and heavy supplementation with barbiturates, meperidine or inhalational anesthesia was necessary the result was called poor. Of those patients in whom paresthesia was obtained 18 out of 20 were completely satisfactory blocks. In six of eight failures in this series, paresthesia was not elicited and there were only four cases in which block was successful without paresthesia being obtained.

COMMENT

The convenience of the lateral approach as described is evident. There are, however, certain disadvantages inherent to this method. It frequently takes several attempts at placement of the needle before paresthesia is obtained. This can be accounted for by the thickness of the tissue in this region, and the fact that the nerve is compressed anteroposteriorly so that

TABLE 1

RESULTS OBTAINED WITH SCIATIC NERVE BLOCK

Total Number of Patients	Age Range and Average (Years)	Amount of Drug Used, Range and Average (ml.)	Results	
			Good	Poor
Lateral 30	18-70 59	15-60 27	22	8
Posterior 30	15-83 55	15-40 32	23	7

the shorter axis of the nerve presents to the needle. A better result is frequently obtained when paresthesia is to the foot, the heel or the toes rather than in thigh or calf. The latter paresthesias may have been referred from the periosteum.<sup>4</sup>

One might expect "flooding" of the tissue to be more effective in the posterior approach since the nerve is surrounded by loose connective tissue at the point where it emerges from the pelvis. In contrast at the point which can be reached by a needle from the lateral approach the sciatic nerve is confined in a narrow space between muscles. Consequently the drug must be accurately deposited or it will not diffuse to envelope the nerve. From the above discussion it seems obvious that paresthesia is almost a necessity for a good result in the lateral method.

#### SUMMARY

A technique of sciatic nerve block employing a lateral approach is presented. A comparison is made with results obtained by the posterior technique.

Miss Jessie Phillips, Medical Illustrator, prepared the illustrations.

#### REFERENCES

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