

# Anterior Approach to Sciatic Nerve Block

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SCIATIC nerve block with local anesthetics has proved particularly useful for operations performed below the knee. These include transmetatarsal amputations, open and closed reductions of fractures of the ankle and foot, operations on soft tissue of the leg and foot, and below-knee amputations. It may also be used in combination with other regional nerve blocks, such as the femoral, obturator, lateral femoral cutaneous, and with local infiltration along the line of the inguinal ligament to block the ilioinguinal and iliohypogastric nerves, for lower limb operations extending to the thigh.

The classical technique as described by Labat,<sup>1</sup> or the modification by Pitkin,<sup>2</sup> requires that the patient be in either the Sims' or prone position. In extremely obese patients the assumption of positions other than the supine is frequently technically impossible, and for patients with fractures of the long bones, pelvis, or vertebrae there is increased hazard in change of position. A lateral approach for block of the sciatic nerve has been presented by Ichijanagi,<sup>3</sup> but in the extremely obese patient this may be as difficult to achieve as the classical or modified classical approach.

An anterior approach for the regional blocking of the sciatic nerve offers several advantages: (1) it requires no change in the patient's position to accomplish other blocks, such as femoral, lateral femoral cutaneous, and obturator; (2) it offers no hazard to an injured patient incident to being turned into a lateral or prone position; (3) the time required for a combination of blocks is lessened, in that only one area of skin need be prepared; and (4) the block can be repeated during an unexpectedly long operation on the leg or foot.

This report describes an anterior approach to the sciatic nerve which has been used in 52 cases by our full-time residents in anesthesiology and by rotating surgical house staff

on anesthesia service. In only two cases was there failure to achieve satisfactory anesthesia.

## Anatomy

The sciatic nerve, largest nerve of the body, in the adult measures from 1.5 to 2 cm. in width and from 0.3 to 0.9 cm. in thickness at a level just distal to the greater trochanter, the site at which it is blocked by the anterior approach. As the nerve leaves the pelvis it

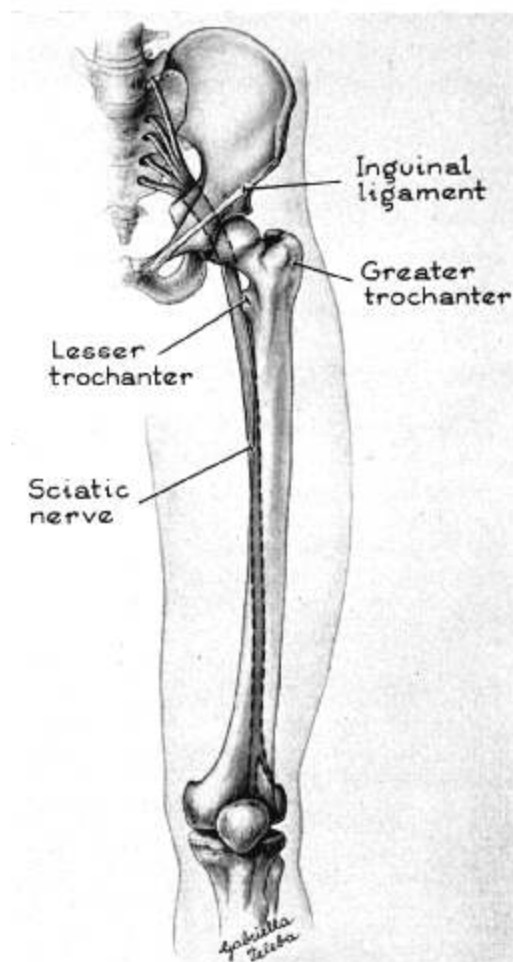


FIG. 1. Relationship of sciatic nerve to the pelvis and femur from anterior view.

Accepted for publication December 18, 1962. Dr. Beck is Assistant Clinical Professor of Anesthesiology, The University of Texas Southwestern Medical School, and Senior Attending Staff, Anesthesiology, Parkland Memorial Hospital, Dallas.

passes through a hollow between the greater trochanter of the femur and the ischial tuberosity (fig. 1). Here it is posterior to the gemelli, obturator internus, and quadratus femoral muscles and anterior to the gluteus maximus muscle. The posterior femoral cutaneous branch, originating from the first to third sacral segments, and supplying the posterior surface of the thigh, varies in its proximity to the sciatic nerve and may either accompany the sciatic nerve or separate from it cephalad to this point. Blood vessels which accompany the sciatic nerve at the point of blocking in the anterior approach are the sciatic artery, a branch of the inferior gluteal, and the inferior gluteal veins. In this area both the artery and the veins are relatively small.

### Technique of the Anterior Sciatic Block

With the patient lying supine and the lower extremity in a neutral position, the skin is prepared from above the inguinal ligament to mid-thigh, including the anterior and lateral surfaces. The line of the inguinal ligament is visualized and trisected. A perpendicular is extended down the thigh from the junction of the middle and medial thirds of this line. The greater trochanter is then palpated and a line extended from it medially across the anterior surface of the thigh, parallel to the inguinal ligament. The junction of this line and the perpendicular is the landmark for the anterior approach (fig. 2). At this point a skin wheal is raised, and a 15-cm., 20-gauge

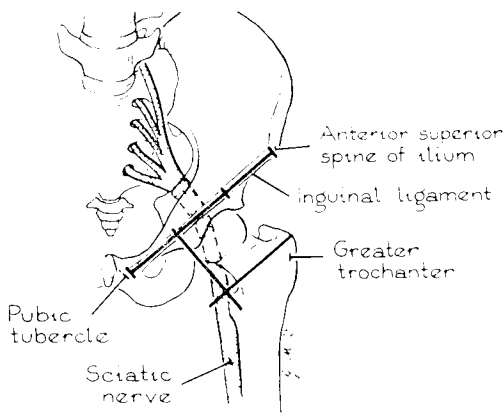


FIG. 2. Landmarks for anterior approach to the sciatic nerve.

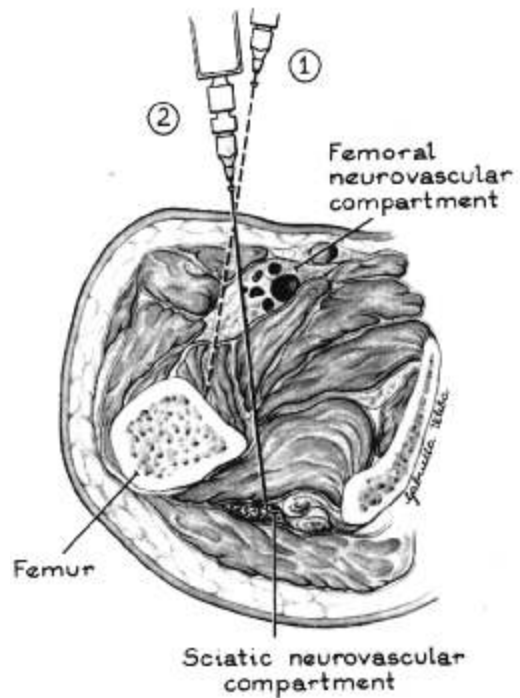


FIG. 3. Cross section of upper thigh demonstrating of needle placement from anterior approach to the sciatic nerve.

needle with stylette is inserted through the wheal in a slightly lateral direction until the anterior medial surface of the femur is met. The needle is withdrawn to the subcutaneous tissue and redirected in a perpendicular direction to miss the femur and introduced 5 cm. beyond the depth at which the femur was first touched. At this point the needle tip should be slightly posterior and medial to the femur and located within the neurovascular compartment of the sciatic nerve (fig. 3). The depth from the femoral surface has been found to vary from 4.5 to 6 cm. A 10-ml. syringe is attached to the needle, aspiration performed, and a tentative injection with a local anesthetic is carried out to test for "feel." If some resistance to injection is experienced, as if the tip of the needle were still within a muscle bundle, the needle is introduced to a greater depth until lack of resistance occurs upon injection of the anesthetic. Paresthesias are not sought. When there is minimal resistance to injection, such as occurs when injecting into an easily distensible compartment,

the proper neurovascular space has been reached. This is filled with a local anesthetic, using from 15 to 30 ml. of solution. We have usually employed 30 ml. of 1.5 per cent lidocaine, or an equivalent volume of 0.15 per cent tetracaine, with or without the addition of a vasoconstrictor, according to the anticipated requirements of the individual case.

If other nerve blocks are indicated, they are performed after injection of the sciatic nerve.

### Results

Of 52 patients for whom anterior sciatic block was done, the first 20 were performed by the author with success in each case. The remainder of the cases were performed by full-time residents in anesthesiology and by members of the surgical house staff rotating through the anesthesia service. In 49 cases, definite hypesthesia has occurred in all but one case within 10 minutes and anesthesia in the distribution of the sciatic nerve within 20 to 40 minutes after injection. In one of the three cases in which complete anesthesia was not achieved, a resident performed a sub-arachnoid block 20 minutes after the sciatic block was attempted because of uncertainty of the regional block. This case was not adequately evaluated before resorting to another technique. In two cases only partial anesthesia was achieved, and supplementation with thiopental-nitrous oxide was necessary. However, in one of these cases analgesia in the sciatic distribution was present at the conclusion of the operation and lasted for a total of four hours. In the 52 cases paresthesias were elicited in only five instances. Premedication has range from none at all to combinations of barbiturate and atropine or narcotic and atropine. In 12 cases phenazocine (0.5–1.5 mg.) was also given prior to the start of operation. There were no discernible postanesthetic complications.

### Discussion

The anterior sciatic nerve block is a useful addition to the armamentarium of the anesthesiologist. Landmarks are straightforward, and there is a real advantage and facility in performing a combination of nerve blocks for lower extremity work without changing the patient's position. In performing this block it is important for the anesthesiologist to de-

velop "the feel of the tissue plane" in recognizing the depth at which the injection should be done. One might expect filling of the tissue space with a local anesthetic to result in an increased incidence of reactions. However, there have been no evident reactions to the local anesthetic drugs in this series. Perhaps this is due to the minimal blood supply within the sciatic neurovascular compartment.

The high percentage of success in blocking the sciatic nerve at this point may be because the anesthetic solution is contained within a fascial compartment in proximity to a compact sciatic nerve with the fibers all within one bundle. At the site of the classical or modified classical approach to the sciatic nerve it may consist of several cords. The evidence of successful block without first having obtained paresthesias has been gratifying in this series, but in no way limits one from seeking a paresthesia. Intravascular injections have not occurred, and since the point of introduction of the needle is lateral to the femoral vessels they are not likely to be involved.

### Summary

An anterior approach to the sciatic nerve for regional anesthesia is described which requires no unusual position of the patient other than that he be in the supine position; a combination of nerve blocks to include the femoral, lateral femoral cutaneous, obturator, and ilio-inguinal and iliohypogastric nerves may also be done without changing the patient's position. There were 52 patients in this series, and successful sciatic blocks were obtained in 49. The landmarks are straightforward, and the technique easy to learn, since blocks have been successfully done in this series by members of the house staff with varying degrees of experience in regional anesthesia.

### References

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