



Blockade of the sciatic nerve in the popliteal fossa

Arturo García Casalia, MD, Gustavo Carradori, MD, Miguel Moreno, MD

From the Instituto Argentino de Diagnostico y Tratamiento, Buenos Aires, Argentina.

KEYWORDS:

Sciatic nerve;
 Popliteal fossa;
 Foot and ankle
 surgery

In this article we reviewed different approaches to the sciatic nerve in the popliteal fossa. Alone or associated with the internal saphenous nerve block, it is an easy, reliable, long lasting block with a low percentage of complications. It is indicated for anesthesia and/or analgesia in forefoot, ankle and foot surgeries. Knowledge of the principles of nerve stimulation and anatomic characteristics of the sciatic nerve are needed for its successful implementation. Success of the block is mainly determined by eliciting inversion or combined inversion/plantar flexion at 0.3-0.5 mA/0.1 msec and by injecting 35 to 45 ml of the selected local anesthetic.

© 2006 Elsevier Inc. All rights reserved.

Blockade of the sciatic nerve associated with the blockade of the femoral nerve supplies anesthesia and excellent quality analgesia for lower extremity surgeries. Although these nerve blockade techniques are not massively used, they have become widespread due to their relatively easy execution and the excellent quality of postoperative analgesia they provide. Nevertheless, detailed anatomical knowledge and familiarity with the different techniques are essential.

This chapter reviews the multiple techniques recently arisen, thoroughly studies the corresponding anatomy, and develops an upgrade on the regional analgesic-anesthetic possibilities that every well-trained anesthesiologist must have.

Anatomical review

The popliteal fossa is a triangular area located in the posterior part of the knee, defined medially by the semimembranosus and semitendinosus muscles and laterally by the femoral biceps muscle. The inferior limit is the line of posterior pleat of the knee. Along the bisector of this triangle, the popliteal vascular package courses with the sciatic nerve, although the vascular package is located deeper in relation to the nerve.⁴

The sciatic nerve, formed by the spinal segments L4-S5, is almost 2 cm in width in adults. Despite the fact that it is usually a single nerve in its itinerary along the posterior face of the thigh, the sciatic nerve can course divided into its two branches (namely, tibial or internal popliteal sciatic nerve and common peroneal or external popliteal sciatic nerve) wrapped in a common connective tissue epineurial sheath. According to Vloka and coworkers,³ this anatomical characteristic of the sciatic nerve and its sheath have clinical effects in the behavior of the blockade since anesthesia is obtained in both divisions even though response to neuro-localization is obtained in one of the two.

If we regard the sciatic as a single nerve, its division into two terminal branches can be observed among the 44 ± 20 mm (from 0 to 113 mm range) upwards the popliteal pleat.^{1,2}

The entire sensitive and motor innervation beneath the knee is supplied by the sciatic nerve, except for a cutaneous-medial area of the leg and the medial face of the foot which are innervated by the saphenous nerve, terminal branch of the femoral nerve (L2-L4).^{5,6}

The tibial nerve is the longest. It is located superiorly below the femoral biceps muscle next to the posterior border of its tendon. Inferiorly, the tibial passes between both heads of the calf muscles and immediately gives the sural nerve. Upwards the sole of the foot, it gives the median calcaneus nerve.

On the other hand, the common peroneal nerve follows the tendon of the femoral biceps laterally surrounding the head of the fibula and gives a communicating sural branch. Once below the head of the fibula, the common peroneal splits into the deep and superficial peroneal nerves.⁷⁻¹³

Address reprint requests and correspondence: Arturo García Casalia, MD, Acceso Norte km, 33,500 ramal Pilar, Pablo Nogués, Buenos Aires, Argentina.

E-mail address: agcasalia@speedy.com.ar.

Indications

- Anesthesia and analgesia for leg, ankle, and foot surgeries.
- Alone or associated to blockade of the internal saphenous nerve.

Contraindications

- Inherent to every peripheral regional blockade.
- Popliteal vascular surgery history.
- Popliteal vascular pathology.
- Popliteal tumor.

Equipment

- Dermographic marker
- Ruler
- Sterile pot
- 20-mL syringe
- Neurolocalization kit: neurolocalizer
- 0.7 × 50-mm, 22-G × 2-inch Teflon insulated needle
- 0.8 × 100-mm, 21-G × 4-inch Teflon insulated needle
- Anesthetic solution
- Needle for skin infiltration: 25-G × 5/8-inch

Techniques

Although the sciatic nerve can be blocked from its outset and all along its itinerary in the gluteal region and thigh, the most common access for its blockade in the thigh is the posterior approach at the level of the popliteal fossa. It can also be accessed through different lateral techniques.

Posterior approach

- Standard ASA monitors are placed, nasal catheter with 2 L/min of oxygen to 100%.
- The blockade is performed with the patient in the prone position and under a grade I-II sedation. For better observation of induced movements, a roll is placed under the leg at the height of the malleolus so as to lift the foot (Figure 1).



Figure 1 Position of the patient in the prone position.

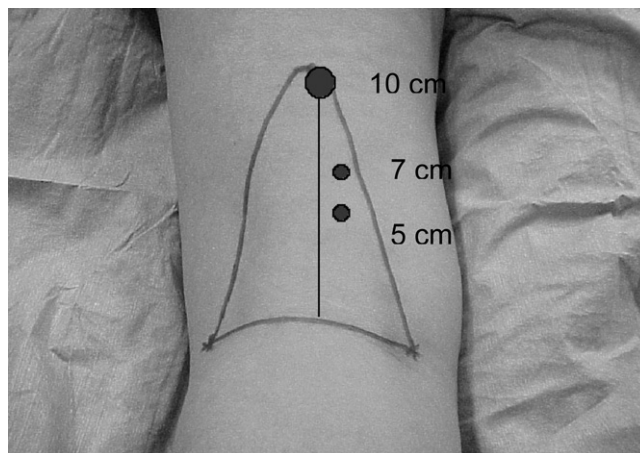


Figure 2 Lines are marked at the skin.

- The patient is asked to flex the knee so that anatomical references stand out. The operator opposes the movement.
- The lines of the popliteal fossa triangle are identified and marked (Figure 2):
 - a) the line of the pleat of the knee that forms the base,
 - b) a line along the internal border of the semimembranosus and semitendinosus muscles as medial limit, and
 - c) another one along the internal border of the femoral biceps muscle which will delimit the lateral face. A bisectrix is traced from the midpoint of the line of the pleat. The insertion site is either 1 cm lateral to the bisectrix from the popliteal triangle 5 to 7 cm as from the pleat¹⁴⁻²¹ or on the midline 10 cm away from the pleat according to Singelyn and coworkers.¹⁵
- After properly preparing the skin with antiseptic, the anesthesiologist is located at the same side of the leg to be blocked.
- A 50-mm Teflon needle attached to a neurolocalizer is inserted with a cephalic inclination of 45°. Neurolocalization begins at 1.5 mA, a duration of pulse of 0.1 msec, and a frequency of stimulation of 2 Hz. The needle is slowly advanced until a motor response usually between 2.5 and 3.5 cm deep is obtained. Then, the stimulus is gradually diminished and the anesthetic solution injected



Figure 3 Needle direction.

Download English Version:

<https://daneshyari.com/en/article/2772432>

Download Persian Version:

<https://daneshyari.com/article/2772432>

[Daneshyari.com](https://daneshyari.com)