Sural nerve biopsy

Technical note

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The uses and operative technique for sural nerve biopsy are described.

KEY WORDS peripheral nerve biopsy sural nerve surgical technique

NERVE biopsy has been helpful in the diagnosis of periarteritis nodosa, amyloidosis, leprosy, metachromatic leukodystrophy, Krabbe's disease, ataxiatelangiectasia, and conditions where the nerve is palpably enlarged. Less information is gained in acutely or subacutely evolving distal symmetrical polyneuropathies of toxic or metabolic origin.

Operative Technique

The patient should be positioned in the lateral decubitus position slightly inclined toward the prone position with the operative side up. The underneath leg is flexed. A pillow is placed between the knees and a sand bag placed under the upper foot to be operated on. Local anesthesia with 1% lidocaine or its equivalent is adequate. The skin incision is placed just lateral and parallel to the Achilles tendon beginning 1 cm proximal to the lateral malleolus and extending proximally for 6 to 8 cm. The nerve lies just superficial to the deep fascia, almost always in close association with the saphenous vein. Branching of the nerve trunk occurs in a majority of cases near the distal end of the incision, but the nerve is a single 1.0 mm trunk at the proximal end. The fact that the nerve is composed of from 5 to 14 bundles of nerve fibers is often apparent grossly and helps distinguish the nerve from the sclerotic veins in this location. Another helpful distinction is that veins branch more nearly at right angles than do nerves.

Once identified, the nerve trunk should be dissected free of adjacent tissues for the length of the exposure. This must be carried out with a minimum of handling, tugging, or stretching of the nerve. Transection of the nerve trunk is performed with a very sharp instrument, preferably a razor blade, using a wooden tongue depressor as a cutting block. Severing the nerve usually causes a jolt of pain in the lateral part of the foot, so the patient must be warned. We have found it useful to block the nerve trunk itself with a small amount of lidocaine a few millimeters proximal to the intended transection site prior to severing the nerve; the proximal transection is always done first in order to render the distal transection painless. For most purposes, a 3 to 4 cm length of nerve suffices. The proximal transection should be performed so that following transection the proximal nerve stump will retract above the level of the skin incision and will not be involved in the healing of the wound. Ligation of the proximal end has not been found necessary.

The biopsy specimen should be laid out on a piece of sterile stiff paper or cardboard.
(a standard 3 X 5 in. index card is suitable), straightened and slightly stretched with a minimum of handling, and allowed to adhere for approximately 1 minute. Excess card paper is trimmed away and the specimen, card and all, is immersed in fixative.

An interrupted mattress skin closure using 4-0 nylon or other monofilament sutures is recommended. An elastic roll-on pressure dressing may then be applied. The patient may be up and about the same day, but sitting with the leg in a dependent position for long periods should be discouraged. Sutures should be left in place for 10 to 14 days.

With this technique, 103 sural nerve biopsies have been performed. Two minor complications have occurred, a superficial wound infection and a proximal stump neuroma.

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