Transient common peroneal nerve palsy following skin cancer excision in the popliteal fossa

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CASE

A male aged 77 years underwent excision of a basal cell carcinoma (BCC) located in the popliteal fossa under local anaesthesia using 5 mL of 1% lidocaine with adrenaline (1:100,000). The lesion was excised using a vertical ellipse and the wound was closed primarily.

Immediately after the procedure a foot drop was noted in the patient. Examination confirmed weakness in ankle dorsiflexion and foot eversion, with preserved ability to plantar flex and intact sensation over the posterior calf and lateral aspect of the foot.

QUESTION 1

What are the possible causes of the observed foot drop following excision of a skin cancer in this region?

ANSWER 1

The findings are consistent with an isolated common peroneal nerve palsy. The examination findings as described above confirms the tibial and sural nerve are intact.

Nerve injuries in this area may be broadly classified into the following causes:

- local anaesthesia related[1,2]
- direct nerve injury[3,4]
- mechanical compression.[4]

Transient blocks are generally benign and do not result in structural nerve injury or lasting neurological symptoms. Resolution typically occurs once the drug diffuses away from the site of action and is metabolised or redistributed. However, local anaesthetics can be neurotoxic.[1,2] When high doses of local anaesthetic are administered, particularly intrafascicularly, it can lead to disruption of cell membranes, axonal transport and induce apoptosis of Schwann cells.[2] Adrenaline induced toxicity can occur from prolonged or high doses of adrenaline resulting in decreased neural blood flow and ischaemic neurapraxia.[1]

Direct surgical trauma or transection of the nerve will result in axonotmesis or neurotmesis with a prolonged recovery or permanent deficit.[3,4]

Mechanical compression resulting from oedema, tight fascial closure or surgical positioning might also contribute to nerve injury.[4]

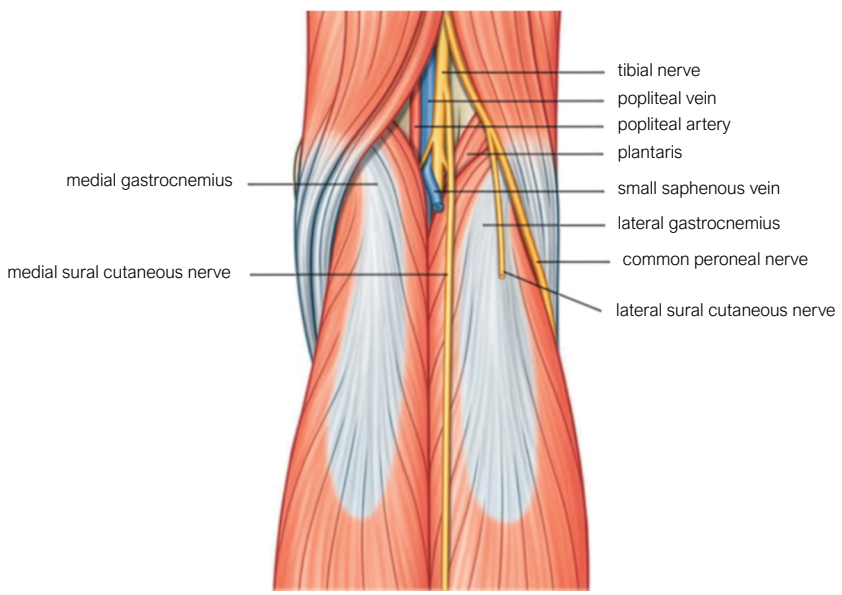

Figure 1. Anatomy of the popliteal fossa illustrating the sciatic nerve bifurcation and course of the common peroneal nerve and tibial nerve as well as the branches of the sural nerve. The common peroneal nerve runs along the lateral aspect of the fossa (near the biceps femoris tendon) and gives off the lateral sural cutaneous nerve and a communicating branch.

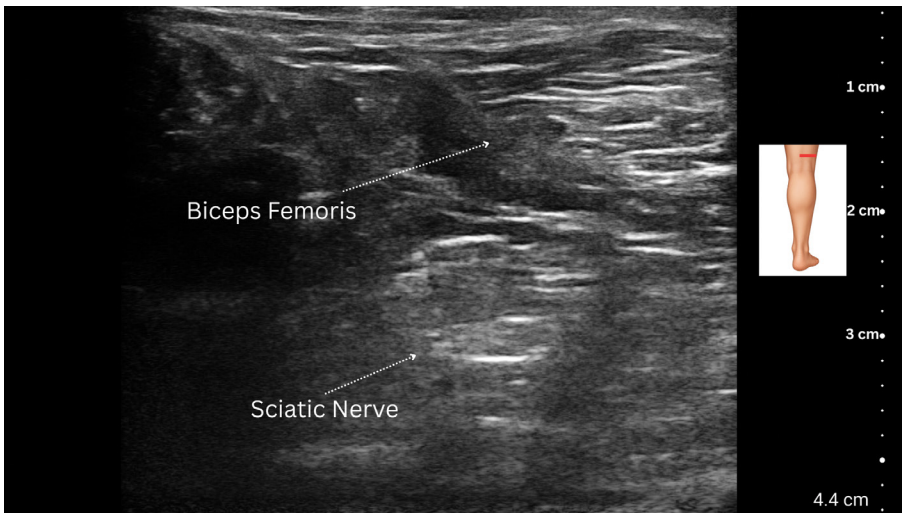

Figure 2. Transverse ultrasound scan at the level of the distal posterior thigh, just before the sciatic nerve bifurcation. The sciatic nerve sits near the short and long head of the biceps femoris muscle.

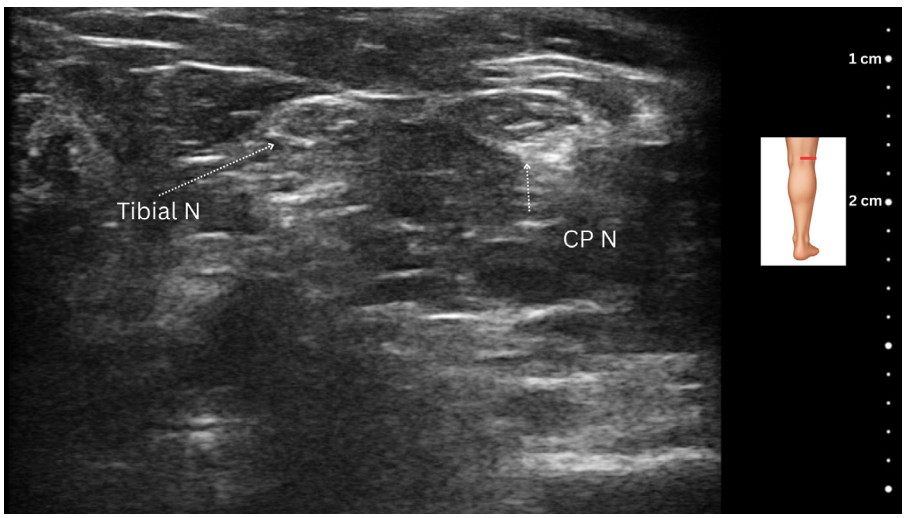

Figure 3. Bifurcation of the sciatic nerve to the tibial and common peroneal nerve.
CPN, common peroneal nerve; Tibial N, tibial nerve.

QUESTION 2

Why is the common peroneal nerve vulnerable in the popliteal fossa?

ANSWER 2

The common peroneal nerve lies superficially as it curves around the fibular neck and courses just medial to the biceps femoris tendon in the popliteal fossa (Figure 1).[4] In elderly patients with reduced subcutaneous tissue, even superficial infiltration of local anaesthetic in this region may result in nerve involvement due to diffusion.

At the 2-week postoperative review, a bedside ultrasound was performed over the surgical site. The images sequentially show the distal course of the sciatic nerve in the posterior thigh (Figure 2), its bifurcation into the tibial and common peroneal nerves (Figure 3) and the trajectory of the common peroneal nerve as it approaches the surgical incision (Figure 4A). In Figure 4B, the common peroneal nerve is visualised just below the popliteal fascia at a depth of approximately 1 cm from the skin surface. This highlights its vulnerability to iatrogenic injury within the popliteal fossa.

CASE CONTINUED

The patient's symptoms began improving later that day. By the following morning dorsiflexion, eversion and sensation in the peroneal distribution had fully recovered.

QUESTION 3

What features distinguish a local anaesthetic nerve block from a more serious nerve injury?

ANSWER 3

Local anaesthetic blocks typically result in a transient conduction block without structural nerve damage, leading to full recovery within hours.

Neurapraxia is the mildest form of nerve injury and involves a transient conduction block without axonal disruption. It typically resolves within days to weeks.[5,6]

Axonotmesis describes axonal severance with preservation of the nerve's connective tissue framework allowing potential for regeneration.[5,6] Axons distal to the injury may undergo Wallerian degeneration. This causes paralysis and loss of sensation in the nerve distribution immediately after injury.[5,6] Axonal regrowth is slow (roughly 1 mm per day) and may take weeks or months of recovery time.[7,8]

Neurotmesis is a complete transection of the nerve. Wallerian degeneration promptly ensues distal to the lesion. There is immediate and total loss of motor and sensory function in the nerve distribution. Without surgical intervention (nerve repair or grafting), regrowth cannot bridge the gap in a meaningful way. Even with microsurgical repair, full recovery is often incomplete.[5,7]

QUESTION 4

What precautions should be taken when injecting local anaesthetic over the popliteal fossa?

ANSWER 4

General precautions include:

- Use of a short needle (13 mm) with incremental and superficial infiltration.

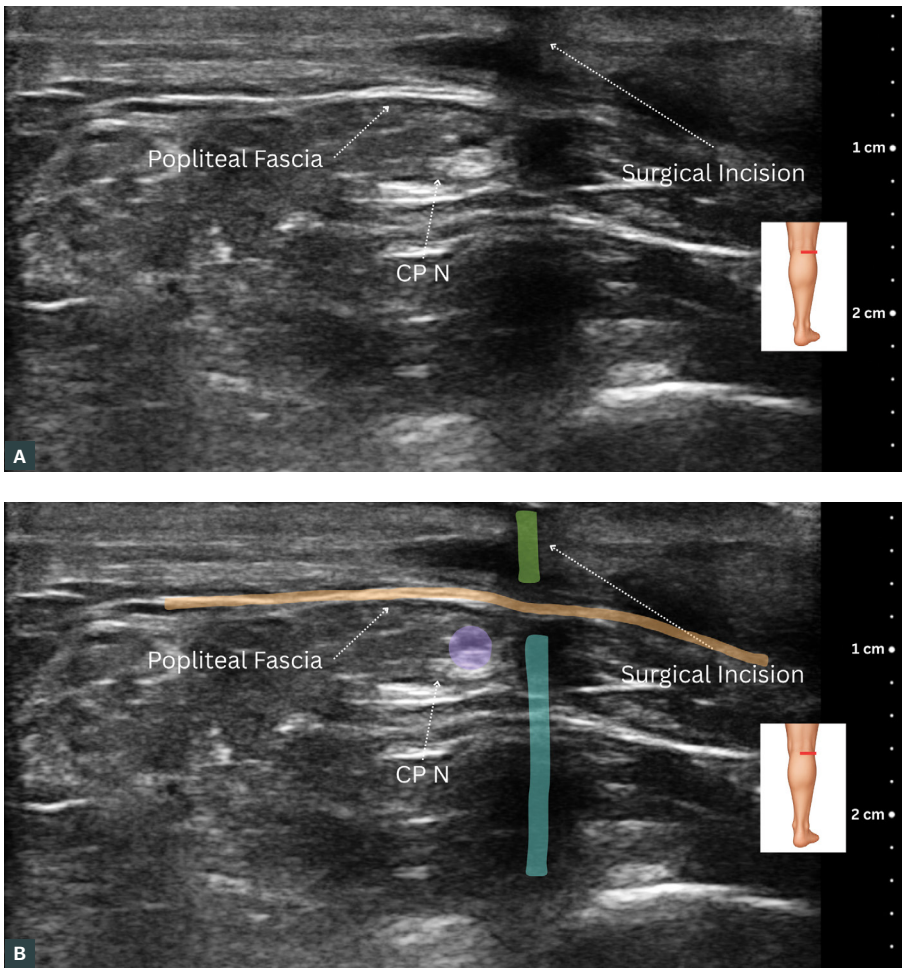

Figure 4. Case photos. **A.** Shows the common peroneal nerve in relation to the muscular fascia and the surgical incision. **B.** Annotated ultrasound scan of Figure 4A**.** Green: surgical incision site as shown by discontinuity of the skin and subcutaneous tissue. Surgical dissection was performed above the fascia. Orange: Popliteal fascia. Purple: Common peroneal nerve. Teal: Mild posterior shadowing, representing partial attenuation of the ultrasound beam with reduced echogenicity of the underlying tissues below the incision site.

CPN, common peroneal nerve.

- Using the lowest effective dose and concentration of anaesthetic.
- Consideration of ultrasound guidance if possible.
- Postoperative monitoring/examination of motor function prior to discharge.

CASE DISCUSSION

While the risk of common peroneal nerve injury at the fibular head is well documented in the medical literature, iatrogenic injuries involving its proximal course within the popliteal fossa are less frequently discussed.

A transient conduction block of the common peroneal nerve is self-limiting but can present significant practical concerns in the outpatient primary care setting. Patients might be discharged inadequately informed of the potential for foot drop, which places them at risk of falling and unable to safely drive home. Given that the duration of local anaesthetic effects may extend for several hours, it is important for clinicians to be aware of this risk and counsel patients accordingly.

Key points

- The common peroneal nerve lies superficially in the lateral popliteal fossa as well as fibular head/neck and is vulnerable to injury.
- A transient foot drop from a nerve block, although self-limiting, might present a logistical challenge for safe patient discharge in an outpatient general practice setting.
- Precautions should be taken against iatrogenic nerve injury in the popliteal fossa region and patients should be counselled on this possibility.

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