Multiple Locations of Nerve Compression: An Unusual Cause of Persistent Lower Limb Paresthesia

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My disclosure is in the Final AOFAS Program Book. I have no potential conflicts with this presentation.
Introduction

• “Double crush” phenomenon – first described by Upton and McComas in 1973.¹

They observed that some patients with ulnar or median peripheral neuropathy had associated cervicothoracic root lesions.

• Much of available literature concentrates on upper limb compressive neuropathy (particularly carpal tunnel syndrome) and cervical radiculopathy.²⁻⁵

• We present a patient with multiple locations of nerve compression from the spine to the peripheral nerve.
Case report

• 40-year-old male who presented with low back pain and paresthesia to his posterolateral calf and sole (Figure 1a-b).

• He underwent L4/5 and L5/S1 lateral recess decompression; the sole pain resolved, but the lateral calf paresthesia persisted. Repeat MRI (Figure 1c-d) showed re-stenosis; the patient declined repeat spinal surgery.

• He later discovered a lump over his left lateral calf; this was firm, tender and had a positive Tinel’s sign (Figure 2).

• The area of calf paresthesia, however, started proximal to the location of the lump.
Figure 1. Lumbar spine MRI in 2008 (1a-b) and 2010 (1c-d).

There is left-sided lateral recess stenosis with impingement of the L5 and S1 nerve roots. The 2010 images show re-stenosis of the lateral recess.
Figure 2. MRI of the left calf (2a–d: contiguous axial images, 2e-f: contiguous coronal images).

The peroneal muscle herniation is marked by the bold arrows; the superficial peroneal nerve by the arrowhead.

There was compression on the superficial peroneal nerve by the herniated peroneal muscle as it passed from deep to superficial through the fascia.
Case report

• The patient underwent open surgical decompression of the superficial peroneal nerve.

• A pseudo-neuroma was identified at the location of peroneal muscle herniation.

• Tracing the nerve further proximally reviewed a second pseudo-neuroma where a branch of the nerve also traversed the deep fascia.

• At one year after surgery, the paresthesia symptoms have resolved entirely.
Figure 3a: The peroneal muscle herniation is marked by the unbroken line whereas the area of paresthesia is marked by the broken line. The arrows mark the superficial peroneal nerve. The forceps points to where the nerve was entrapped as it traversed the fascia. Figure 3b: A second location of entrapment at exactly the proximal limit of paresthesia.

Figure 3c-d: The distal and proximal pseudo-neuromas.

Figures 3e-f: Corresponding MRI did not pick up the proximal peroneal muscle herniation.
Discussion and Conclusion

• It is perhaps not uncommon for lower limb symptoms to persist or obtain only partial relief after spinal surgery. The index of suspicion for a separate pathology was not aroused when our patient’s symptoms did not improve. A nerve conduction study would have indicated a peripheral neuropathy.

• We suggest that orthopaedic and spine surgeons keep in mind the possibility of “double crush” phenomenon in the lower limbs. We also highlight the importance of careful correlation of symptoms, signs and radiology, the significance of which this patient’s case demonstrates.
References


2 Lo SF, Chou LW, Meng NH, Chen FF, Juan TT, Ho WC, Chiang CF. Clinical characteristics and electrodiagnostic features in patients with carpal tunnel syndrome, double crush syndrome, and cervical radiculopathy. Rheumatology Int 32:1257-63, 2012.

