

# Central median nerve injury secondary to carpal tunnel steroid injection followed up with serial ultrasonography and electrophysiology

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## Abstract

Intra-neural injection is a rare but serious complication of carpal tunnel steroid injection. We present a case of central median nerve injury following injection where nerve ultrasound identified the lesion within the substance of the median nerve. Most needle injuries will respond to conservative treatment, and can be conveniently assessed, monitored and potentially prevented by using ultrasound.

## CASE REPORT

A 38-year-old lady presented with a three-week duration of shooting pain in the right thumb, index and middle finger immediately following a local steroid injection for carpal tunnel syndrome. On physical examination, the affected digits were swollen with accompanying hyperesthesia. Tinel's test was positive.

Nerve conduction study (NCS) revealed

prolonged distal onset latency of the right abductor pollicis brevis muscle compound muscle action potential (CMAP) with normal sensory nerve action potentials (SNAPs). Our impression was a right carpal tunnel syndrome with neuropraxia resulting from inadvertent intraneural injection. Ultrasonography showed a 0.8cm long hyperechoic lesion within the central portion of the median nerve at the level of the wrist. (Figure 1)

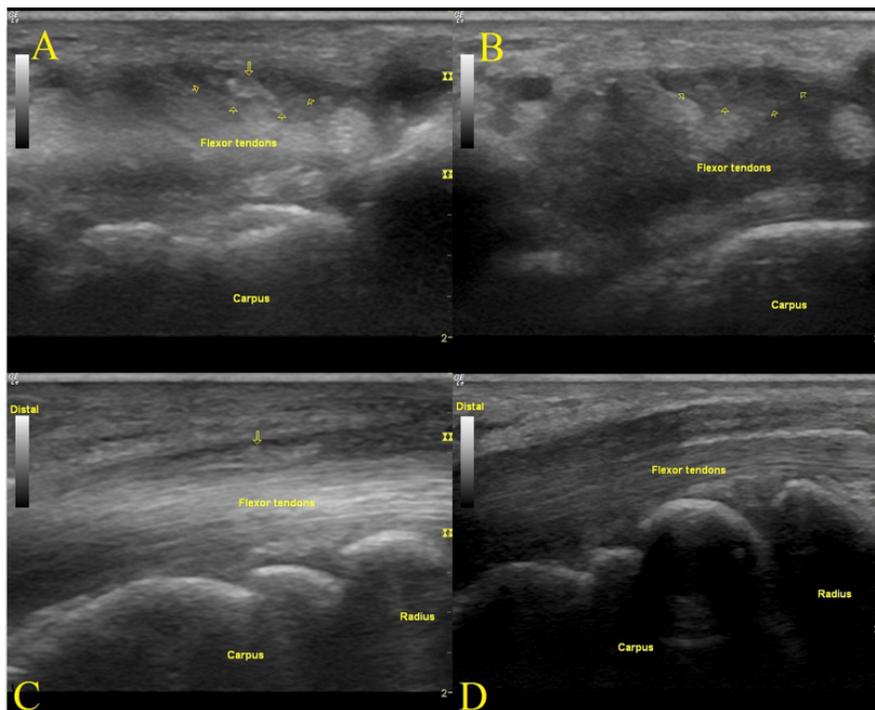


Figure 1. A, Cross sectional ultrasound image of the right median nerve at the wrist 3 months after injection. A centrally located focal hyperechoic lesion (downward arrow) within the median nerve (upward arrows). B, Image at 14 months showing resolution of the lesion. C, Longitudinal section of the focal hyperechoic lesion (arrow) 3 months after injection D, Image at 14 months showing resolution of the lesion.

We treated her conservatively with non steroidal anti-inflammatory agents, a night wrist splint and hand therapy. We followed her up at 3, 6 and 14 months after the first injection, with NCS and ultrasonography at each visit. Her symptoms improved with time. At 14 months, the NCS showed improvement with signs of re-innervation. Ultrasonography showed that the hyperechoic lesion had spontaneously resolved.

**DISCUSSION**

Intra-neural injection is a rare but serious complication of carpal tunnel steroid injection. In our case, the median nerve injury correlated with a well-defined hyperechoic lesion within the substance of the median nerve on ultrasonography. We suspect this to be predominantly inflammatory tissue as follow-up showed considerable improvement. The location of the intraneural lesion corresponded anatomically with the central location of the thenar muscle motor fibres (Figure 2).<sup>1</sup> This would account for the delayed distal CMAP

latencies on nerve conduction studies. The fascicles responsible for the sensation in the radial three digits were likely only partially affected, which would explain the relative preservation of the SNAP latencies. The swelling in the affected digits was possibly caused by autonomic vasomotor dysfunction, which is a recognized complication of median nerve injury.<sup>2</sup>

Most of these injuries will respond to conservative treatment, as one such previous study demonstrated by following up a patient with a similar injury with ultrasound and NCS.<sup>3</sup> These adjuncts are useful to monitor conservatively managed cases, and neurolysis may be considered if the patient is not showing improvement. Furthermore, it is of importance to note that the use of nerve ultrasound to guide steroid injections can prevent the complication of intraneural median nerve injection.<sup>4</sup>

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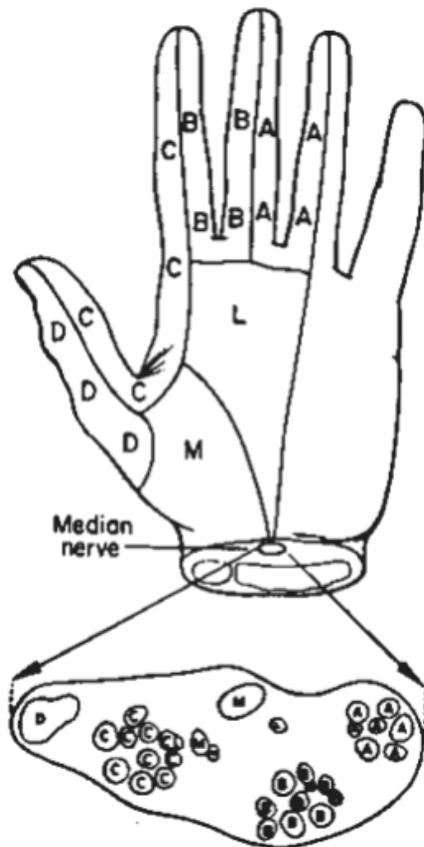


Figure 2. Topography of the median nerve at the level of the radial styloid. A, B, C, D, funiculi corresponding to sensory fibres respectively. M, thenar muscle motor fibres.<sup>1</sup>