

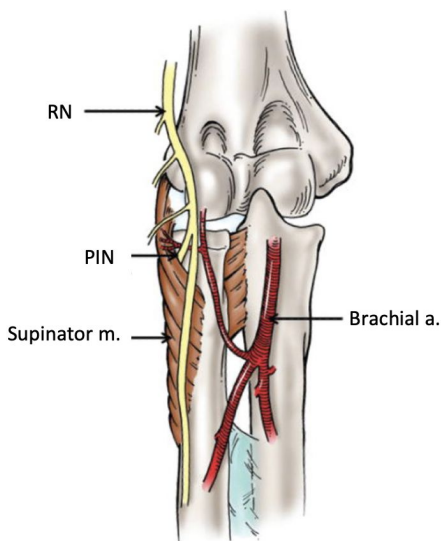
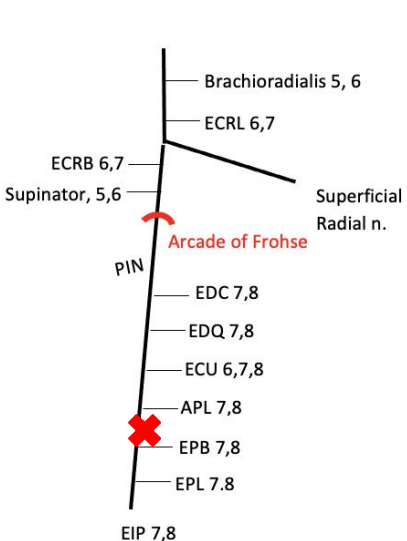
Finding the PIN in the Haystack: Case report on the localization of a Posterior Interosseous Nerve lesion

Patricia Colucci OMS-III, Alissa Mirochnitchenko, M.S., OMS-III, Preston Ooi, D.O., PGY-I



Background

Posterior interosseous nerve (PIN) lesions are uncommon: the closest epidemiological estimation is less than 3 in 100,000. This is a report on a PIN lesion, a radial nerve (RN) derivative, distal to the Arcade of Frohse (AOF) with unknown etiology. The RN descends to innervate the brachioradialis and extensor carpi radialis longus (ECRL) before piercing the supinator muscle and traversing through the AOF (Fig. 2). RN entrapment most commonly occurs at the AOF. Various etiologies of entrapment include ganglion cysts, lipomas, trauma, rheumatoid nodules, and a hypertonic supinator muscle.



Patient Presentation

A 45 year old male with a history of multilevel anterior cervical spine discectomy and fusion (ACDF) and right cubital tunnel release presented to clinic with persistent right hand weakness. Although his numbness had improved in the fourth and fifth digits, he still experienced dorsal forearm fatigue and thumb extension weakness on the right side. He denied recent trauma or any other comorbid chronic conditions. Physical exam revealed 5/5 strength in bilateral upper extremities, 1/5 strength in first digit extension and abduction, 2/5 strength in second digit extension, and 4/5 strength in third through fifth digits.

Electromyography (EMG) & Nerve Conduction Study (NCS)

Findings

- Ulnar neuropathy (findings comparable to previous studies) and chronic C5-6C6 radiculopathy (history of ACDF)
- Normal median sensory and motor nerve
- Normal radial sensory nerve
- Radial neuropathy between the takeoff of the nerve to abductor pollicis longus (APL) and extensor pollicis brevis (EPB)
- Right extensor pollicis brevis (R. EPB) and extensor indicis proprius (R. EIP) demonstrated 2+ positive sharp waves and 2+ reduced recruitment

Discussion

Test results suggested a lesion distal to the AOF (Fig. 1) due to the preservation of EDC and EDQ strength. Positive sharp waves and decreased recruitment at EPB and EIP indicate the lesion is distal to the AOF. The patient's history of ACDF made it difficult to rule out C7 or C8 radiculopathy without further investigation. He was referred to neurosurgery to prevent further loss of function.

Conclusion

- Partial recovery of motor strength of muscles innervated by PIN
- No further NCS required, the patient will follow up as needed
- Important to investigate different causes of new pathology when multiple chronic pathologies exist
- EMG and NCS enhanced by foundational anatomical knowledge can uncover rare pathology

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Fibrillations Positive Recruitment Sharp Waves

	Fibrillations	Positive Sharp Waves	Recruitment
R. ECU	None	None	Normal
R. APL	None	None	Normal
R. EPB	None	2+	2+ Reduction
R. EIP	None	2+	2+ Reduction

Fig. 3: Abbreviated EMG findings

Fig. 1: RN distal to spiral groove with AOF and postulated lesion (marked)

Fig. 2: Anatomic relationship between AOF and PIN