



A Case Report: Ultrasound detected Ulnar Neuropathy

Secondary to Posterior Ulnar Recurrent artery

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INTRODUCTION

Cubital tunnel syndrome is the second most common compressive neuropathy of the upper extremity. It is typically caused by ulnar nerve compression at the elbow, most commonly by Osborne's ligament, the flexor carpi ulnaris, or the arcade of Struthers. Although the ulnar nerve is accompanied by adjacent vascular structures, they rarely result in clinically significant nerve compression. Vascular anomalies have occasionally been reported as rare causes of ulnar neuropathy. We present a rare case of cubital tunnel syndrome caused by an enlarged posterior ulnar recurrent artery, diagnosed using electrodiagnostic studies and ultrasound.

CASE

A 66-year-old woman presented with a 1-year history of radiating pain from the left elbow to the hand, associated with progressive motor weakness and sensory loss in the ulnar nerve distribution. Conservative treatment for several months, including oral medication and activity modification, failed to improve symptoms, and intrinsic hand muscle atrophy progressed.

Physical examination demonstrated full range of motion of the fingers, wrist, and elbow. Hypoesthesia distal to the elbow in the ulnar nerve distribution and atrophy of the first dorsal interosseous and abductor digiti minimi muscles were observed. A positive Tinel's sign was elicited at the cubital tunnel. Plain radiographs revealed no abnormalities. NCS and needle EMG confirmed left ulnar neuropathy across the elbow (Figure 1, 2).

As ulnar neuropathy was identified, ultrasound examination was performed to evaluate the ulnar nerve and cubital tunnel structures in comparison with the contralateral side. The left posterior ulnar recurrent artery was enlarged relative to the right side, with focal thickening of the left ulnar nerve at the cubital tunnel (Figure 3). Anatomically, the superior ulnar collateral artery terminates proximal to the cubital tunnel, whereas the posterior ulnar recurrent artery courses within the tunnel. Thus, the enlarged vessel in this case was consistent with the posterior ulnar recurrent artery.

Based on these findings, the patient was diagnosed with ulnar neuropathy secondary to compression by an enlarged posterior ulnar recurrent artery. Ultrasound-guided ulnar nerve hydrodissection was performed. Further evaluation such as MRI or angiography and referral for surgical management will be considered if symptoms persist.

Sensory NCS	Stimulation	Latency (ms)	Amplitude (μ V)		Muscle	IA	Fib	PSW	IP
Rt. median	Wrist	2.10	29.7		Lt. ADM	Increased	++	++	Partial
Lt. median	Wrist	2.15	29.3		Lt. FDI	Increased	+	+	Partial
Rt. ulnar	Wrist	2.10	25.4		Lt. FDP	Increased	+	+	Complete
Lt. ulnar	Wrist	3.15 *	18.1 *		Lt. FCU	Increased	+	+	Complete
Motor NCS	Stimulation	Latency (ms)	Amplitude (mV)	Velocity (m/s)					
Rt. median	Wrist	3.0	8.7		Lt. APB	Normal	-	-	Complete
	Elbow	7.1	8.5	54.5	Lt. FCR	Normal	-	-	Complete
Lt. median	Wrist	3.0	8.6		Lt. ECR	Normal	-	-	Complete
	Elbow	7.0	8.4	52.3	Lt. triceps	Normal	-	-	Complete
Rt. ulnar	Wrist	3.1	8.6		Lt. biceps	Normal	-	-	Complete
	Below elbow	5.8	8.4	62.7	Lt. deltoid	Normal	-	-	Complete
	Above elbow	6.9	8.3	66.1	Paraspinalis Lt. C5-T1	Normal	-	-	Complete
Lt. ulnar	Wrist	4.2 *	4.5 *						
	Below elbow	6.7 *	4.3 *	60.0					
	Above elbow	8.2 *	4.1 *	42.9 *					
Lt. ulnar segmental	Wrist	4.2 *	4.5 *						
	Below elbow	6.7 *	4.3 *	57.7					
	2cm	6.9 *	4.2 *	66.7					
	4cm	7.4 *	4.1 *	44.4 *					
	6cm	7.6 *	3.9 *	80.0					

Figure 1) Nerve conduction study. *Abnormal value.

Figure 2) Electromyography. IA: insertional activity, Fib: fibrillation, PSW: positive sharp wave, IP: interference pattern, Lt.: left, ADM: abductor digiti minimi, FDI: first dorsal interosseous, FDP: flexor digitorum profundus, FCU: flexor carpi ulnaris, APB: abductor pollicis brevis, FCR: flexor carpi radialis, ECR: extensor carpi radialis

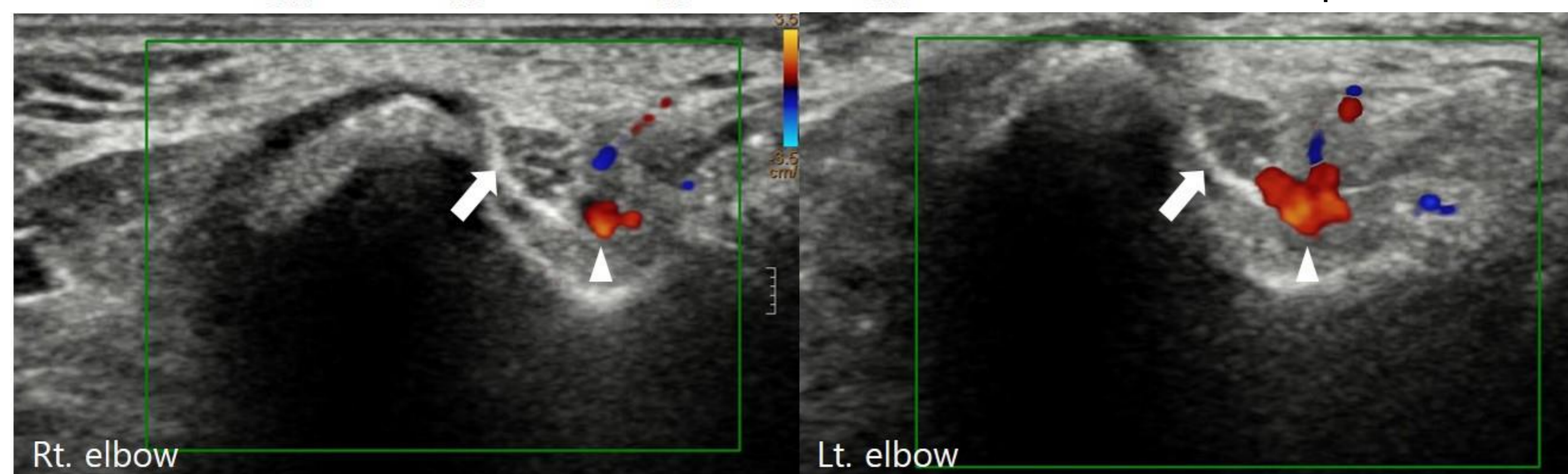


Figure 3) Transverse sonograms of the ulnar nerve in the cubital tunnel with power doppler. Left ulnar nerve appears focally enlarged with decreased echogenicity (white arrow) compared to the unaffected right side, while the posterior ulnar recurrent artery (arrowhead) on the left appears enlarged relative to the right side.

CONCLUSION

This case highlights a rare vascular cause of cubital tunnel syndrome due to compression by an enlarged posterior ulnar recurrent artery. Unlike previously reported cases of venous anomalies or superior ulnar collateral artery involvement, our patient's neuropathy was directly attributable to the posterior ulnar recurrent artery within the tunnel. Vascular anomalies should be considered in atypical or refractory ulnar neuropathy. Diagnostic ultrasound is valuable for identifying anomalous structures within the cubital tunnel and guiding safe interventional procedures.