

# Combined EMG and Ultrasound Refines Diagnosis in Female with Elbow Pain

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## Case Description:

A 22 year old former gymnast with a history of UCL injury presented with months of right elbow pain and hand numbness. MRI revealed a bone ossicle around the common flexor tendons. She reported pain and numbness were worse doing repeated hand stands. On examination, she had full strength except 4+/5 finger abduction. Sensation was intact to light touch. There was tenderness to palpation at the ulnar groove, however this did not reproduce sensory symptoms. Phalens produced right 5<sup>th</sup> digit numbness.

NCS revealed reduced amplitude in ulnary sensory studies, reduced amplitude at the elbow in ulnar motor studies with slowing at the elbow. Needle EMG showed only mildly reduced recruitment in the first dorsal interosseus of the right hand. These findings were suggestive of Ulnar Nerve Entrapment in the right elbow. The patient returned for Ultrasound examination, and a bone ossicle was visualized just distal to the medial epicondyle. Tenderness to sonopalpation was present in this region, and it reproduced hand numbness in the 5<sup>th</sup> digit. In long axis, it was evident that the nerve was adjacent to the structure with evidence of swelling. There was no sign of cubital tunnel or retrocondylar groove swelling.

## Follow up:

The patient was referred for surgery and ultimately underwent operative treatment.

## Ultrasound Images

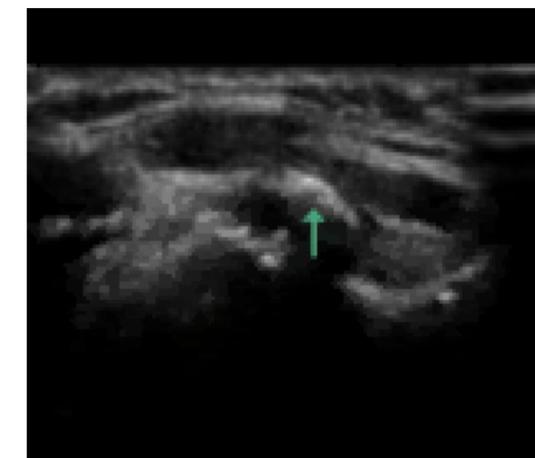
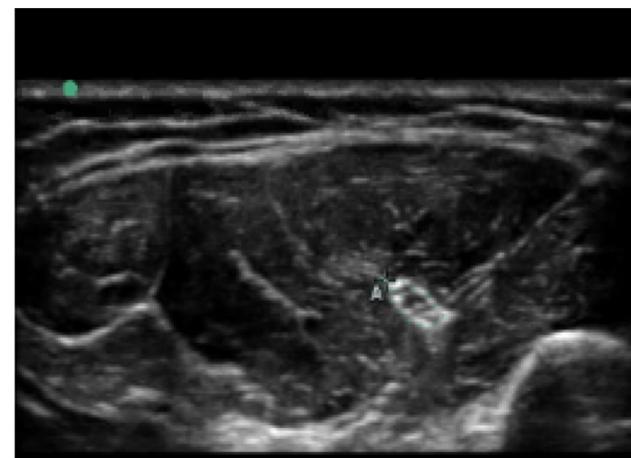
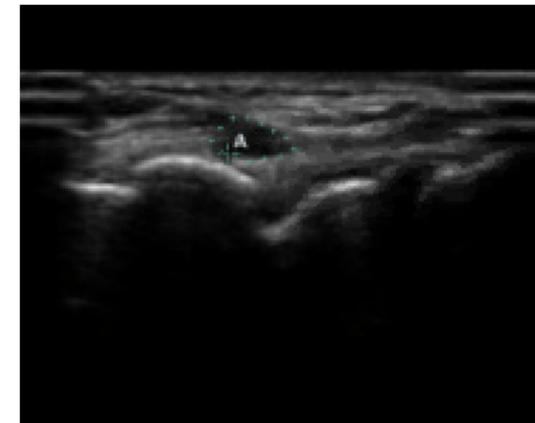


Figure A: medial epicondyle in short axis.

Figure B: suspected bone ossicle in short axis.

Figure C: cubital tunnel in short axis.

Figure D: suspected bone ossicle in long axis, with green arrow pointing to the ossicle.

Figure E: cubital tunnel viewed in long axis.

## Discussion

Electromyography has long been the gold standard for diagnosis of peripheral nerve entrapments and injuries. With the advancement in ultrasound technology, some providers have utilized this modality to augment their ability to properly diagnose these conditions, and in some cases lead to more precise etiologies than with EMG alone.

The added information can inform the decision to perform surgery as compared to more conservative measures, as well as assist in surgical planning. In this way, utilizing ultrasound can be beneficial to both the patient and the treating physician, in discussion and planning of potential treatment options.

## Conclusion

We describe a case of a 22 year old patient whose clinical picture and EMG/NCS findings fit with cubital tunnel syndrome, however with the use of ultrasound we were able to make a more precise diagnosis. This case demonstrates the benefit of the combined use of EMG and ultrasound for diagnosis and for surgical planning.

