

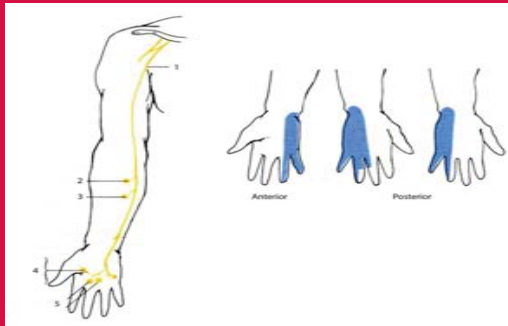
Introduction

The cubital tunnel spans a length of 15 cm from midarm to midforearm and is the most common area for compression of the ulnar nerve, second to carpal tunnel^{1,3}. Compression, traction, and frictional forces within the cubital tunnel may cause entrapment of the ulnar nerve resulting in symptoms of pain, paresthesia, and muscle weakness.

In this case study, a 19 year old male collegiate wrestler reported to the athletic trainer with symptoms of pain to the right elbow, intermittent paresthesia to the hand, and a sensory deficit along the distal ulnar nerve distribution. Referral was made to a physician for further evaluation.

Objective

The objective of this case study is to correctly distinguish the cause, identify the presenting signs and symptoms, along with following the proper course of treatment for patients with cubital tunnel syndrome.



Distribution of ulnar nerve muscle innervation (left) and sensory dermatome of the hand (right).

1) Proximal ulnar nerve. 2) Branch to flexor carpi ulnaris. 3) Branch to flexor digitorum profundus. 4) Branch to adductor pollicis and flexor pollicis brevis. 5) Branch to interossei and lumbricals 3 and 4⁵.

Background and Evaluation

The athlete reported to the athletic training room after sustaining a hyperextension injury to the right elbow during practice. Three years ago the patient had a fracture to the olecranon growth plate which was treated by casting and rehab. He always had some persistent ulnar nerve irritation symptoms following this injury. Daily activities such as talking on the phone, sleeping, and lifting weights aggravated his symptoms.

Range of motion was normal in the hand, wrist, elbow and shoulder. Wrist flexion and extension was 5/5. There was no sign of atrophy of the interosseus. A positive Tinel's sign with pain over the right cubital tunnel and a negative Tinel's sign over the carpal tunnel were found. Pain was elicited while performing a valgus stress test, although there was no instability of the elbow. The Froment and Wartenberg signs were both negative. A significant decrease in sensation was noted throughout the ulnar nerve distribution when compared bilaterally.

Differential Diagnosis

- Ulnar Nerve Neuritis
- Cervical Root Neuropathy
- Thoracic Outlet Syndrome
- Brachial Plexus Syndrome
- Carpal Tunnel Syndrome
- Ulnar Nerve Contusion
- Double Crush Syndrome
- Tumor
- Ulnar Nerve Compression at Canal of Guyon



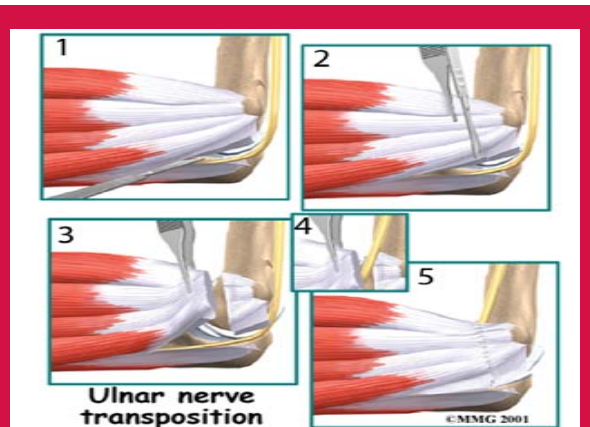
Positive Tinel's sign eliciting distal radicular symptoms⁶.

Diagnosis

Aching or shooting pain, paresthesia, and weakness may present throughout the ulnar nerve distribution along with palpable pain at the medial aspect of the elbow. Possible causes of cubital tunnel syndrome are idiopathic, acute and repetitive trauma, heterotopic ossification, abnormal musculature, overuse and overhead activities, arthritis, iatrogenic, and space-occupying lesion.

Distinguishing between mild, moderate, or severe stages of compression determines the course of treatment. Sensory findings of intermittent paresthesia will present in mild to moderate cases, whereas persistent paresthesia will occur in severe cases. Motor findings of subjective weakness and clumsiness of the hand arise in mild cases and more measurable weaknesses in pinch or grip strength occur in moderate to severe cases. Significant findings of muscle atrophy will be present in severe cases. Diminished two point discrimination, the elbow flexion test, Tinel sign, Froment sign, and Wartenberg sign, may be present in all stages⁸.

X-rays should be examined for bony abnormalities, a well-preserved joint space, a supracondylar process, and signs of arthritis. An electromyography test may confirm ulnar nerve compression and cubital tunnel syndrome. Mild to moderate cases generally follow non-invasive conservative treatment where severe cases may require immediate surgery^{1,2,8}.



1&2) Isolating the ulnar nerve. 3) Detachment of the flexor-pronator mass at the medial epicondyle. 4) Repositioning of the ulnar nerve deep to the flexor-pronator mass. 5) Reattachment of the flexor-pronator mass⁷.

Treatment

Initial treatment was conservative because the athlete was diagnosed with a mild case of ulnar nerve compression. Anti-inflammatory medication was prescribed, the X-ray was negative, and the electromyography test was normal.

Submuscular transposition surgery was performed when the athlete's symptoms progressed to a moderate stage where weakness extended into the 4th and 5th digits. Immediate post-surgical treatment goals were to decrease pain and swelling. The athlete's elbow and wrist were immobilized for the first two weeks post-operation. At one week post-operation, the athlete was allowed to remove the sling to perform pain-free ROM exercises at the elbow and shoulder. At the same time, cardiovascular and core strength exercises were included in the rehabilitation program. At two weeks post-operation, isometric exercises began with an emphasis on the biceps, triceps, deltoid, trapezoids, and rhomboids. ROM exercises for the forearm began at four weeks. Forearm isometrics were contraindicated up until six weeks to allow ample time for the proximal flexor-pronator mass to heal. At the twelve-week follow-up, the surgeon had no restrictions for the athlete unless other concerns arose. The athlete continued functional and strengthening exercises until final clearance by the athletic trainer.

Uniqueness

This case is unique in that it involves a wrestler with cubital tunnel syndrome, which is less commonly seen in non-overhead sports. In this case, the EMG test came back negative for cubital tunnel syndrome and ulnar nerve compression, although the athlete still presented with symptoms of cubital tunnel syndrome.

Conclusion

Early recognition and proper treatment of cubital tunnel syndrome will increase the accuracy and quality of care an athletic trainer can provide to an athlete. Initial conservative treatment should be monitored for muscle weakness along with progressing paresthesia and pain. If worsening symptoms present, immediate referral to a neurologist is warranted.

References

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