



NAILED
The #1 Education Orthopaedic
Podcast In 2020
Weekly Podcast Episodes!
Listen Now!

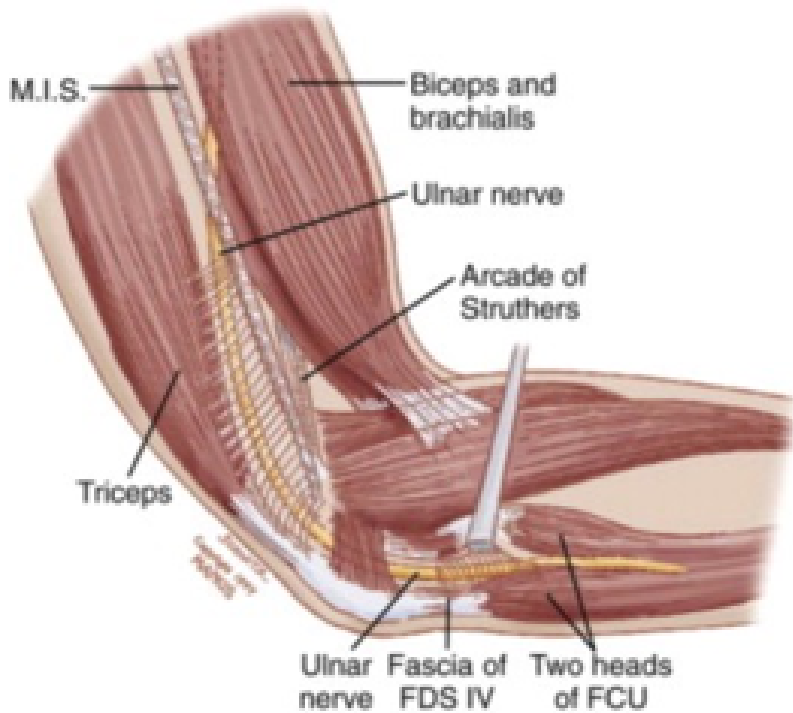
Cubital Tunnel Syndrome w/ Dr. Megan Conti Mica notes

Etiology

- 2nd most common UE compressive neuropathy
- More likely to have advanced disease when they seek treatment

Anatomy

- Cross sectional area of tunnel- diminishes 30-41% during flexion
 - Intra-neural pressure is lowest at 40deg-50deg and inc w/ flexion past 90deg
- Multiple sites of compression
 - Arcade of Struthers
 - thickened connective tissue between triceps and intermuscular septum. 6-10cm prox to medial epicondyle
 - Posterior to medial epicondyle covered by Osborne ligament- 2nd most common site
 - Osborne lig- originates at medial epicondyle + HH of FCU- inserts on to olecranon and ulnar head of FCU
 - Ligament made up of three layers
 - Anconeus epitrochlearis
 - FCU
 - Deep fascia of FCU, between FCU heads
 - FDS
 - FDS fascia



Differential diagnosis

- Thoracic outlet syndrome, ulnar nerve compression in Guyon canal, C8/T1 radicular compression, medial epicondylitis, ulnohumeral osteoarthritis

History

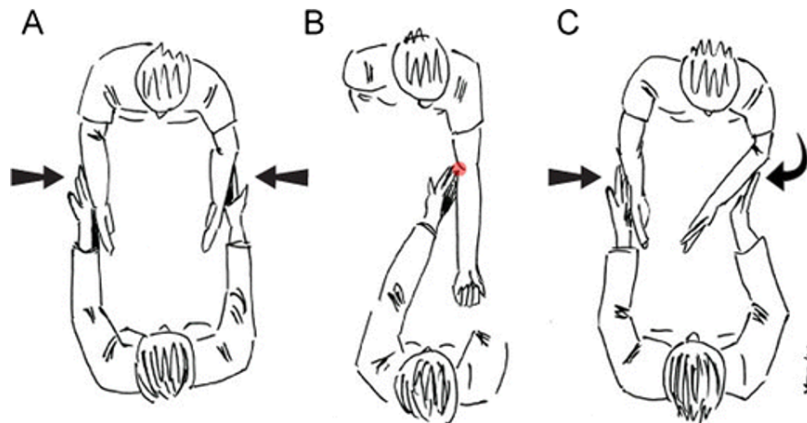
- altered sensation about small + ring finger
 - worse w/ prolonged elbow flexion
- +/- weakness, difficulty clipping fingernails, loss of coordination, pain along course of ulnar nerve

Physical Examination

- Impaired sensation, muscular atrophy- noted in first dorsal interosseus muscle
 - Claw hand deformity



- Provocative maneuvers
 - Nerve percussion at retrocondylar groove + elbow flexion test
 - Scratch collapse test



- Test ulnar nerve stability- finger posterior to medial epicondyle and see if nerve subluxates
- Wartenberg sign- little finger can't actively adduct- (weakness in ulnar innervated 3rd palmar interosseous muscle), so it abducts

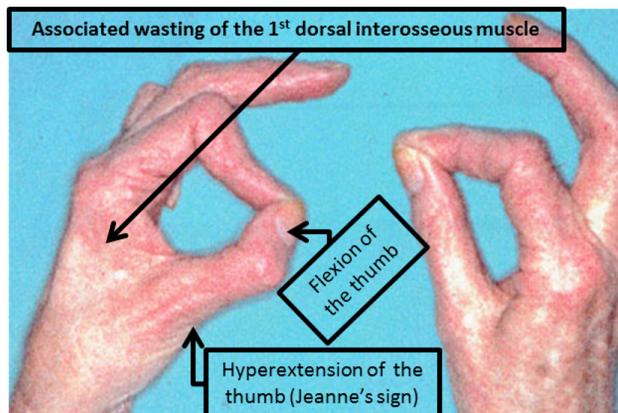


- Froment sign- pt attempts a key pinch + exhibits obligate thumb IP flexion (FPL compensates for weakness of adductor pollicis)

Froment's positive



- Jeanne sign- EPL hyperextends the MCP joint while pt attempts to adduct thumb during key pinch



Electrodiagnostic studies

- Does Not establish diagnosis
- Criteria for dx: decrease in absolute conduction velocity to <50m/s or a relative drop in conduction velocity >10m/s across a measured interval around the elbow

Classification

- Modified McGowan and Dellon system

Grade	McGowan Classification System	Mc Dellon Classification		
	Description	Sensory	Motor	Tests
0	No symptoms	No symptoms	No symptoms	No symptoms
1	Minimal lesions, paresthesia and dysesthesia, no wasting or weakness of ulnar intrinsic muscles	Paresthesias come and go, vibratory perception increased	Subjective weakness, clumsiness or loss of coordination	Elbow flexion test and/or tinel's sign may be positive
2	Intermediate lesions, weakness and wasting of interossei, although some voluntary power is retained	Paresthesias come and go, vibratory perception normal or decreased	Measurable weakness in pinch and/or grip strength	Elbow flexion test and/or tinel's sign are positive. Finger crossing may be abnormal
3	Severe lesions, paralysis of interossei and marked weakness of the hand	Paresthesias are persistent, vibratory perception decreased, abnormal two-point discrimination	Measurable weakness in pinch and grip strength plus muscle atrophy	Elbow flexion test and/or tinel's sign maybe present. Finger crossing usually abnormal

Non surgical management

- Indications:
 - pts w/ mild/moderate cubital tunnel syndrome
- Treatment
 - Custom orthoses, rolled towels in antecubital fossa
 - Avoid direct pressure over medial elbow, repetitive triceps strengthening exercises
- 88% of patients w/ type 1 - 2 ,respond to activity modification
- Nighttime splinting/nerve glide exercises- didn't change outcomes in a RCT

Surgical management

- Indications:
 - Impaired two point sensibility/muscle atrophy- worsening nerve compression results in intrinsic nerve damage
- Options:
 - Simple decompression, medial epicondylectomy, + anterior transposition (subQ, intramuscular, or submuscular)

In situ decompression

- Proximal release: Osborne ligament + superficial/deep fascia of FCU
- Distal release: fascia between medial triceps + medial IM septum
 - Open or endoscopic (outcomes similar)
 - Endoscopic: possible reduced early post op pain, earlier return to work, and diminished peri incisional paresthesia
- Circumferential dissection of nerve avoided
- Decompression vs ulnar n transposition
 - Equivalent outcomes
- Decompression v anterior transposition
 - Decompression assoc w/ early recurrence requiring revision (up to 20%)
- IF hypermobile nerve
 - many recommend transposition or epicondylectomy

Medial epicondylectomy

- Complete epicondylectomy- persistent elbow pain + iatrogenic elbow instability
- Oblique osteotomy now performed
 - Reduces neural strain
- Used in thin patients w/ hypermobile ulnar n + pts w/ vascular pathology

Submuscular, intramuscular, or subcutaneous transposition

- Anterior transposition - moves ulnar nerve anterior to ulnohumeral axis
 - Must circumferentially dissect the nerve.
 - Inferior ulnar collateral a is preserved as well as longitudinal vessels.
 - Nerves is placed
 - In subcutaneous tissue
 - anterior to a fascial sling,
 - Within/beneath the flexor pronator mass
- Submuscular transposition
 - Release of flexor pronator mass and repair over nerve
 - Reserved for thin patients in whom the transposed subQ nerve would b prominent/ or pts w/ advanced disease
 - Assoc w/ more wound complications

Comparing techniques

- Insitu v submuscular
 - Both effective in providing improvement at 1yr.
- Insite v subcutaneous transposition
 - Did not exclude hypermobility
 - At 1 year around 50-60% were free of sx
- Medial epicondylectomy v anterior transposition

- No diff at 1 year. Pts w/ medial epicondylectomy were more satisfied
- Decision analysis
 - Insite decompression as a primary procedure w/ moderate to severe ulnar n compression
 - Submuscular is recommended as salvage procedure in patients w/ persistent sx

Post traumatic cubital tunnel syndrome

- Assoc w/ less chance of complete sx resolution and higher rates of revision surgery
- Pts are satisfied but still have some limitations

Revision/salvage procedures

- Unsuccessful surgery causes- persistent nerve tension + incomplete decompression
- OR chronic compression resulting in nerve damage or neuropathic changes
- Submuscular transposition is most commonly recommended revision technique
- Dissect more proximal and distal

Salvage procedures for ulnar n dysfunction

- tendon/nerve transfers
- Claw correction - tendon transfer to FDS slips harvested 2cm proximal to insertion site- attached to lateral bands
- For pinch strength- lost when adductor pollicis weakens- ECRB or FDS tendon can be used for adductorplasty. OR FDP can be sutured side-to-side
- Nerve transfers= PQ branch of AIN to deep motor of ulnar nerve

Sources:

Staples, J. R., & Calfee, R. (2017). Cubital tunnel syndrome: current concepts. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, 25(10), e215-e224.

Biggs M, Curtis JA: Randomized, prospective study comparing ulnar neurolysis in situ with submuscular transposition. *Neurosurgery* 2006;58(2): 296-304

Bartels RH, Verhagen WI, van der Wilt GJ, Meulstee J, van Rossum LG, Grotenhuis JA: Prospective randomized controlled study comparing simple decompression

Geutjens GG, Langstaff RJ, Smith NJ, Jefferson D, Howell CJ, Barton NJ: Medial epicondylectomy or ulnar-nerve transposition for ulnar neuropathy at the elbow? *J Bone Joint Surg Br* 1996;78(5): 777-779.