

Compression neuropathies of the Ulnar Nerve

Hand Therapy Training Program

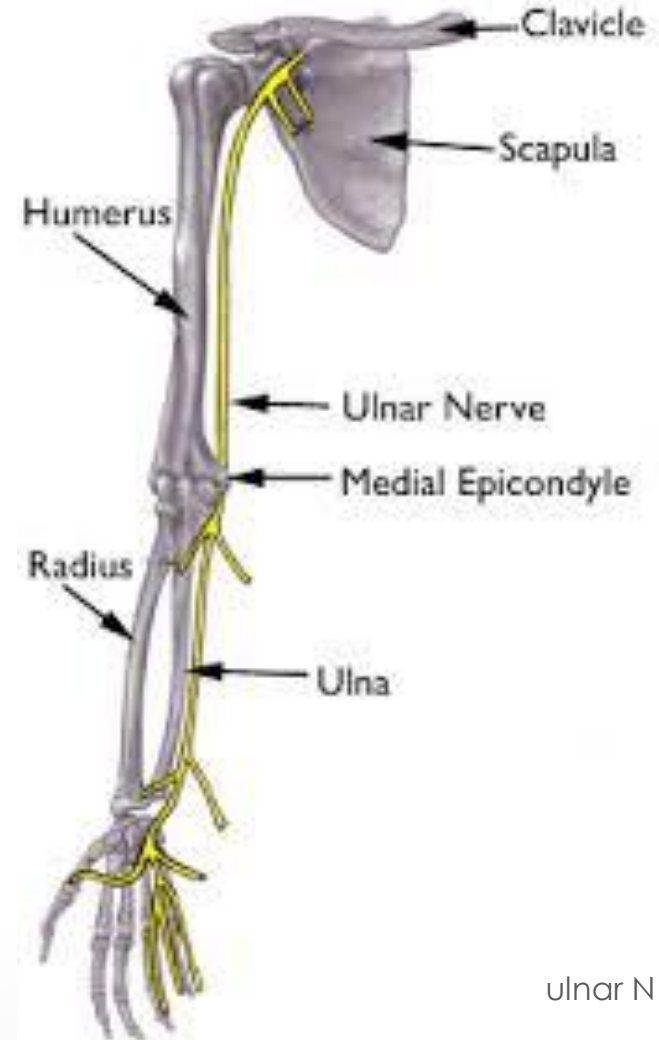
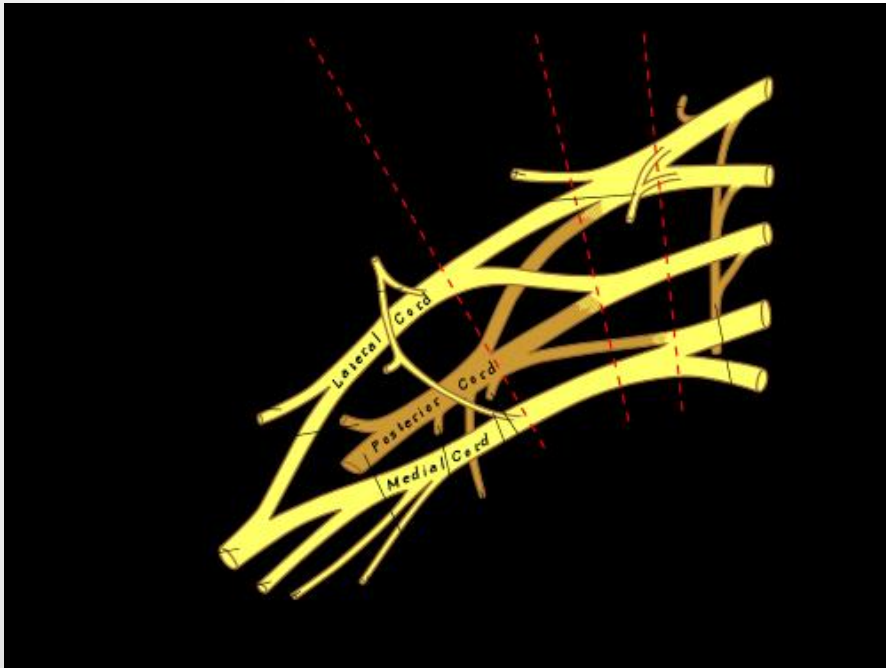
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Ulnar Nerve Compressions

- Course of the Ulnar Nerve
- Sites of compression
- Cubital Tunnel Syndrome, Guyon's Canal
 - anatomy
 - causes
 - conservative management
 - surgical management
 - post Op management

Ulnar Nerve Course



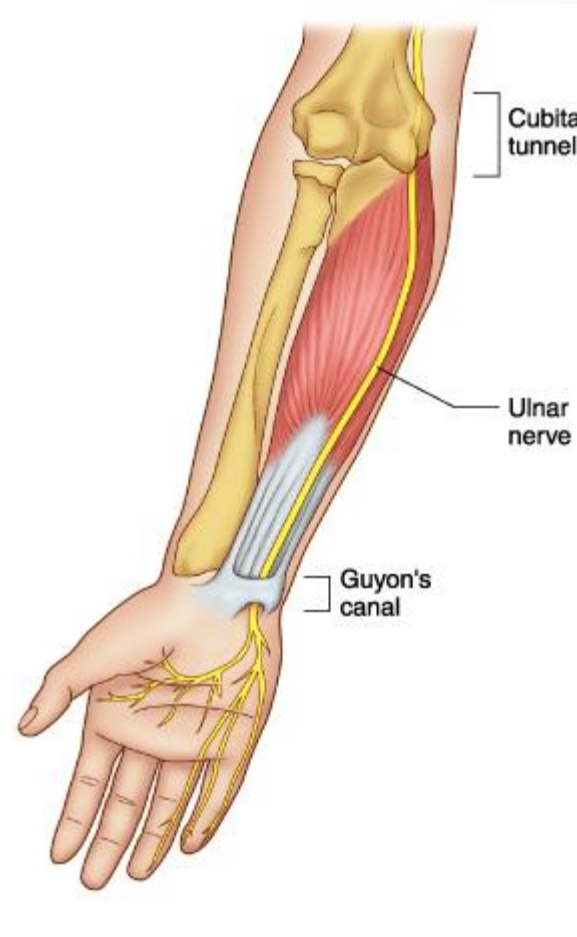
Ulnar Nerve Course

- Formed from medial cord of brachial plexus
- Behind the medial epicondyle (cubital tunnel)
- No branches in the arm
- In forearm, gives off dorsal branch
- Forms a deep and superficial branches
- It continues down the forearm
- It passes into the hand via Guyon's canal



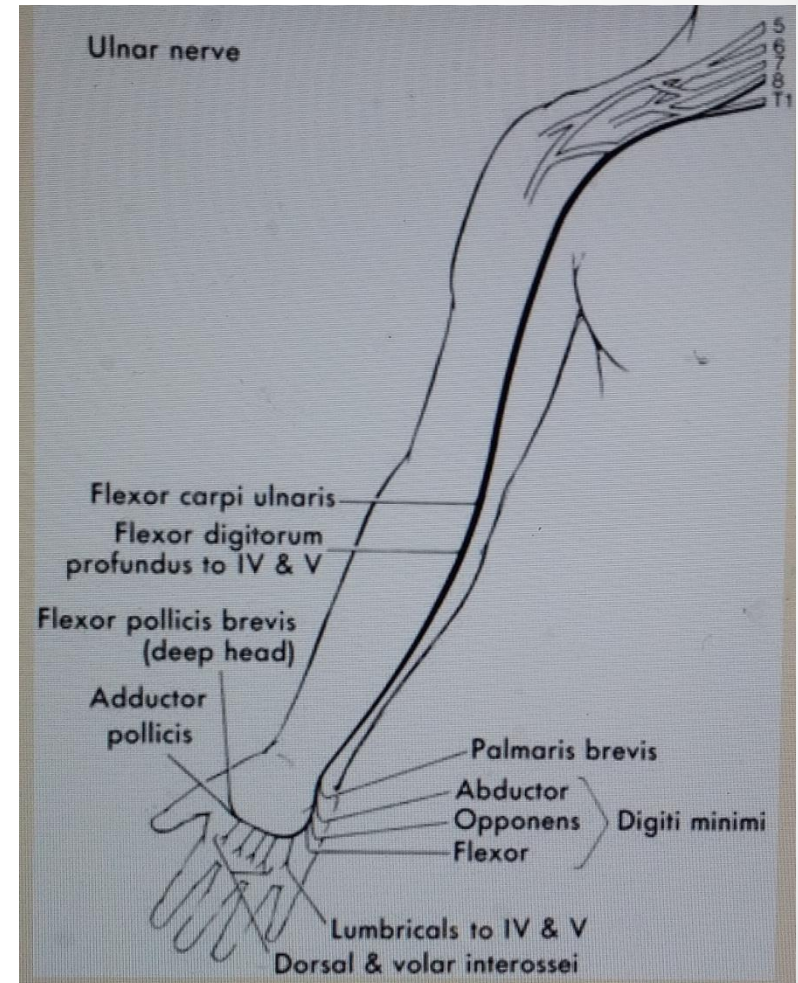
Ulnar Nerve Course

- Enters to the forearm between two head of FCU
- Continues down the forearm between FCU and FDP

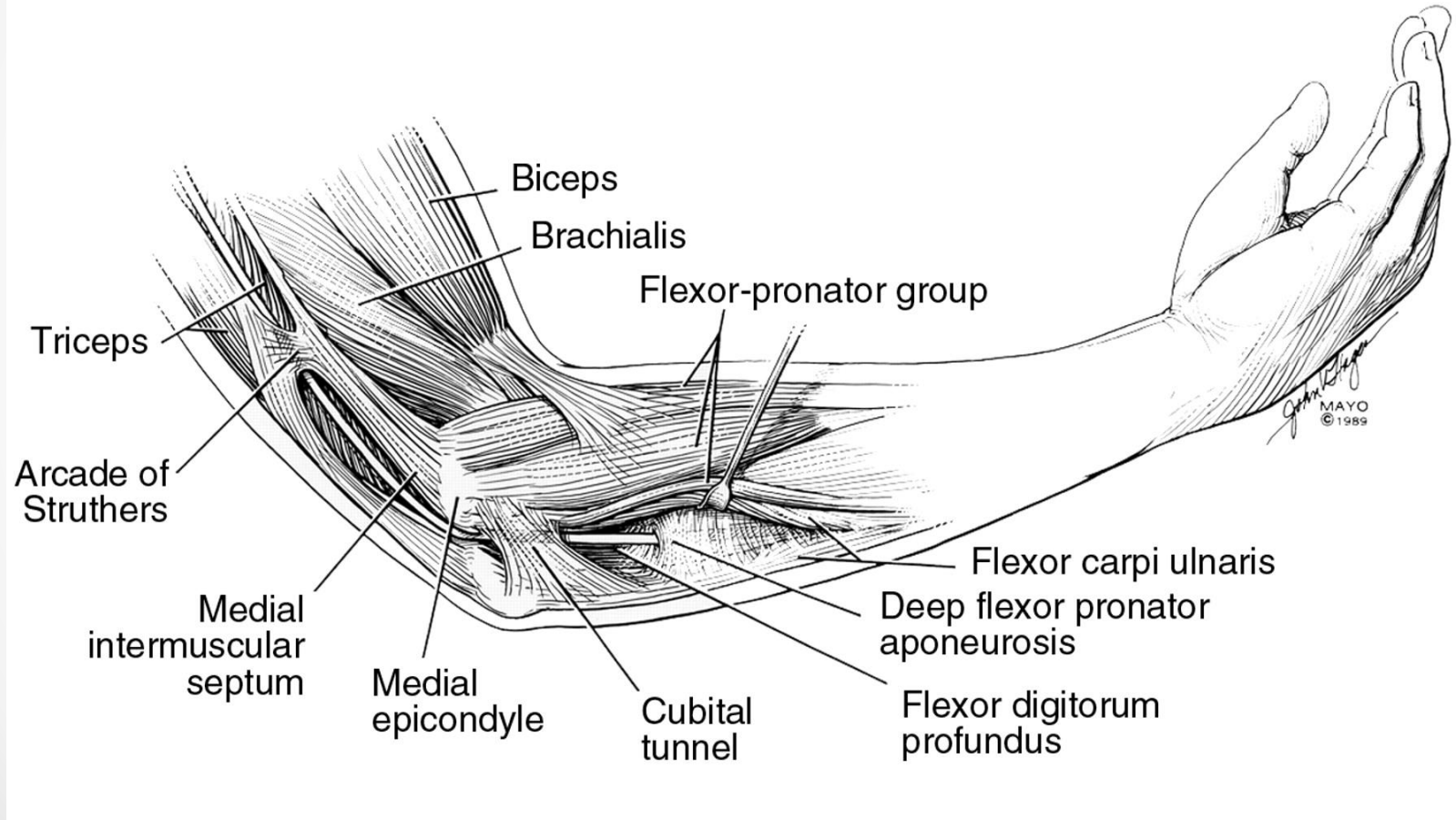


Ulnar Nerve Innervates

- Forearm:
 - FCU,
 - FDP (4th/5th digits)
- Wrist/Hand
 - ADM
 - ODM
 - FDM
 - Lumbricals (III, IV)
 - Interossei (PI, DI)
 - FPB (deep head)
 - Add Pollicis



Sites of compression



Sites of compression

- Arcade of struthers
- The medial intermuscular septum
- The condylar groove
- The cubital tunnel
- The deep flexor pronator aponeurosis
- Two head of FCU
- Guyon's canal

Sites of compression

Arcade of Struthers

- A fascial structure present in approx. 70% of the population
- A fascial band 8 cm proximal to the medial epicondyle, extending from the medial head of the triceps to the medial intermuscular septum

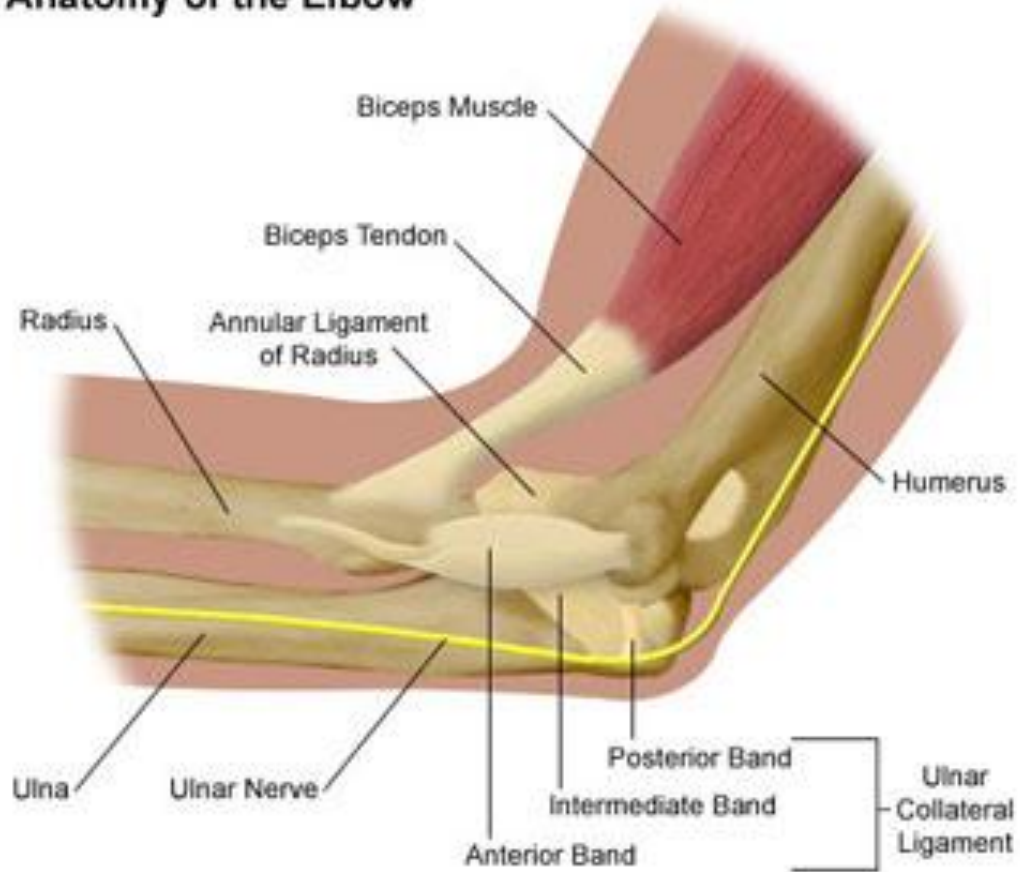
Sites of compression

Arcade of Struthers = **Ligament of Struthers** (Median N)



Cubital Tunnel

Anatomy of the Elbow

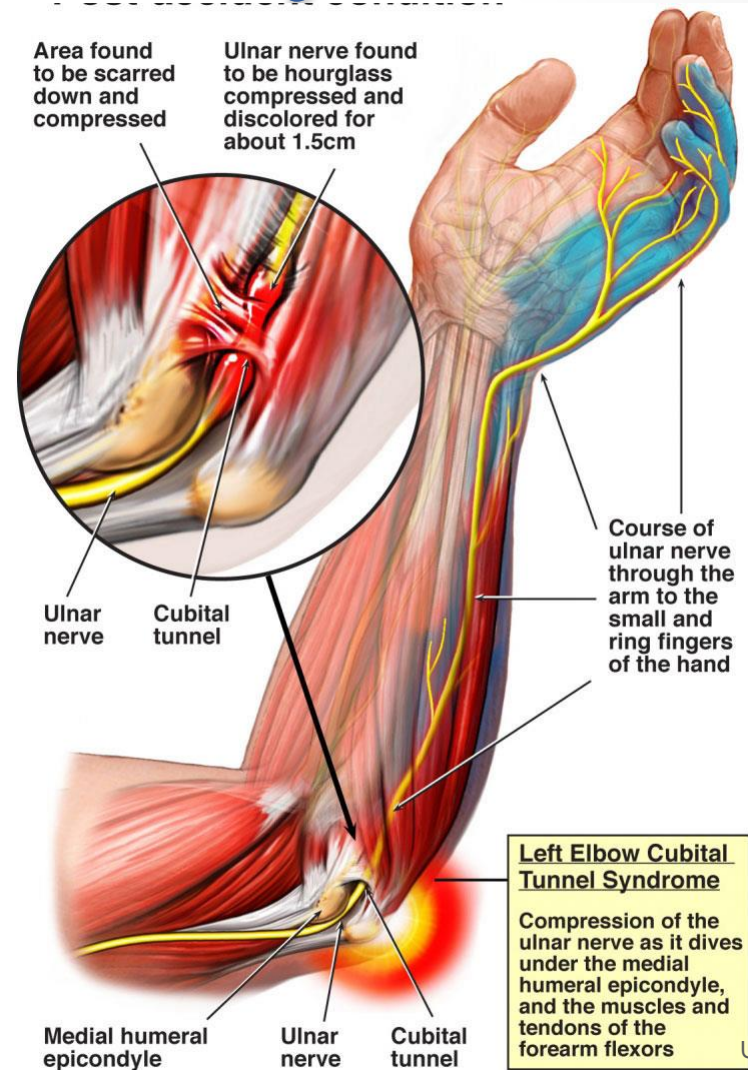


Cubital Tunnel

- The most common pathogenic mechanism is 2^o intermittent traction, when the nerve becomes fixed at one of the sites of compression
 - limits the free gliding

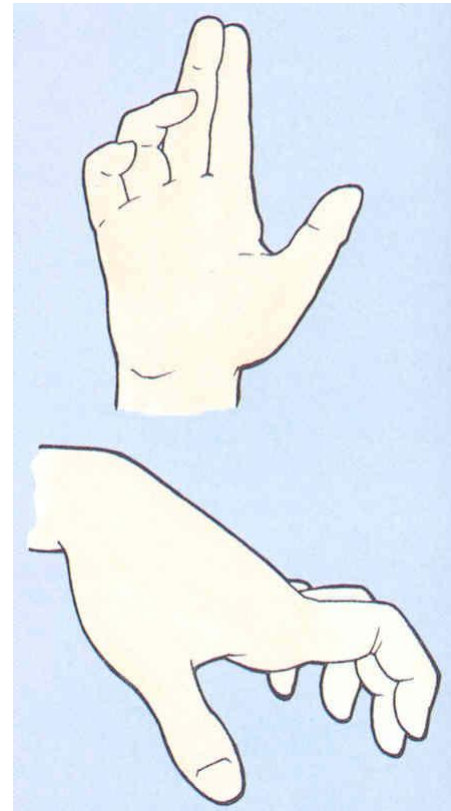
Cubital Tunnel Syndrome

- Clinical signs and symptoms
 - pain or paraesthesia on the medial aspect of the forearm
 - sensory changes in the ulnar side of the hand, the little finger and the ulna half of the ring finger
 - Often worse at night secondary to position



Cubital Tunnel Syndrome

Motor deficits clawing



Cubital Tunnel Syndrome

- Wartenburg's sign:
posturing of the little
finger in abduction
secondary to a weak
interosseous muscle

WARTENBERG SIGN

In ulnar nerve compression the third volar interosseous muscle is weak and allows the extensor digiti minimi to abduct the fifth finger during extension causing finger catching while placing the affected hand in pocket.



Cubital Tunnel Syndrome

Froment's sign:

hyperflexion of the thumb while pinching secondary to a weak adductor Pollicis longus



Cubital Tunnel Syndrome

- Physical diagnosis
 - *+Ve Tinel along course of ulnar nerve
 - * False +ve in 24% of normal
 - *+ve Wadsworth Elbow Flexion Test

Cubital Tunnel Syndrome

- Clinical Diagnosis
 - * Subluxation of ulnar nerve with elbow flexion
 - >compression less likely but more indicative of neural irritation from direct trauma or friction
 - >Present in 16% of asymptomatic individuals

Cubital Tunnel Syndrome

Differential diagnosis

- Proximal compression (Cx, TOS, Pancoast tumour)
- Distal compression (Guyon's canal)
- Medial epicondylitis

Cubital Tunnel Syndrome

Causes

- ❑ Most common location of pathology is in the region of the medial epicondyle
- ❑ A deficient cubital tunnel retinaculum causes the ulnar nerve to sublux with flexion
- ❑ More common the ulnar nerve is fixed by the cubital retinaculum especially with elbow flexion, this can be aggravated underlying elbow pathologies:
 - >haematomas
 - >synovitis
 - >bony changes- # fragment, callus, heterotopic bone, arthritis
 - >direct trauma-elbow dislocation/stretch
 - >direct pressure-positioning in surgery, coma
 - > elbow instability

Conservative Management

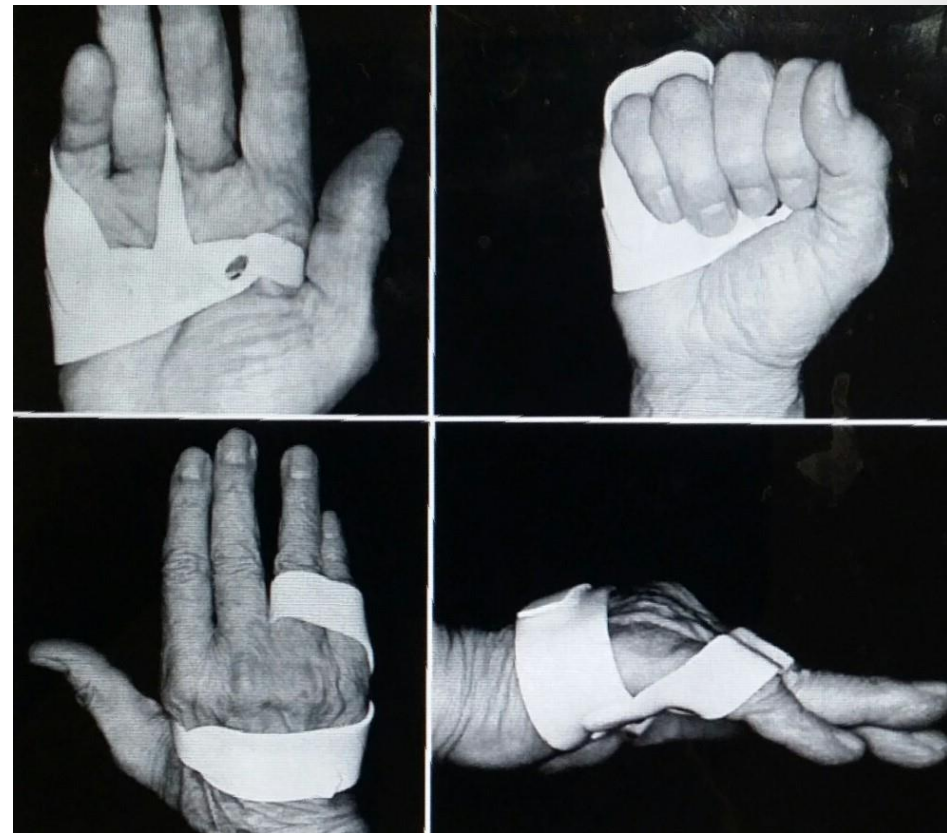
- 90% recovery with conservative regimens (Eisen & Danon 1974)
- “The two general rules of conservative management are to avoid recurrent trauma and to have patience because (nerve) regrowth is slow” (Tardif 1995)

Conservative Management

- Avoidance of pressure on the elbow
- Make ergonomic changes
- Night elbow splinting (the least amount of nerve tension is when the elbow is extended)
- Stretching and strengthening
- Soft tissue massage

Conservative Management

- Anti Claw Deformity Splint



Surgical Management

If conservative management fails surgical decompression is the best option

- ❖ Simple decompression
- ❖ Decompression with medial epicondylectomy
- ❖ Subcutaneous transposition
- ❖ Submuscular transposition
- ❖ Intramuscular transposition

Post op management

Anterior transposition

--subcutaneous:

- *Soft compressive dressing +arm sling 1/52
- *AROM encouraged (aim 90%© 2/52)
- *Work site assessment
- *Gradual return to work programme
- *Ulnar nerve gliding (distal progress to proximal)

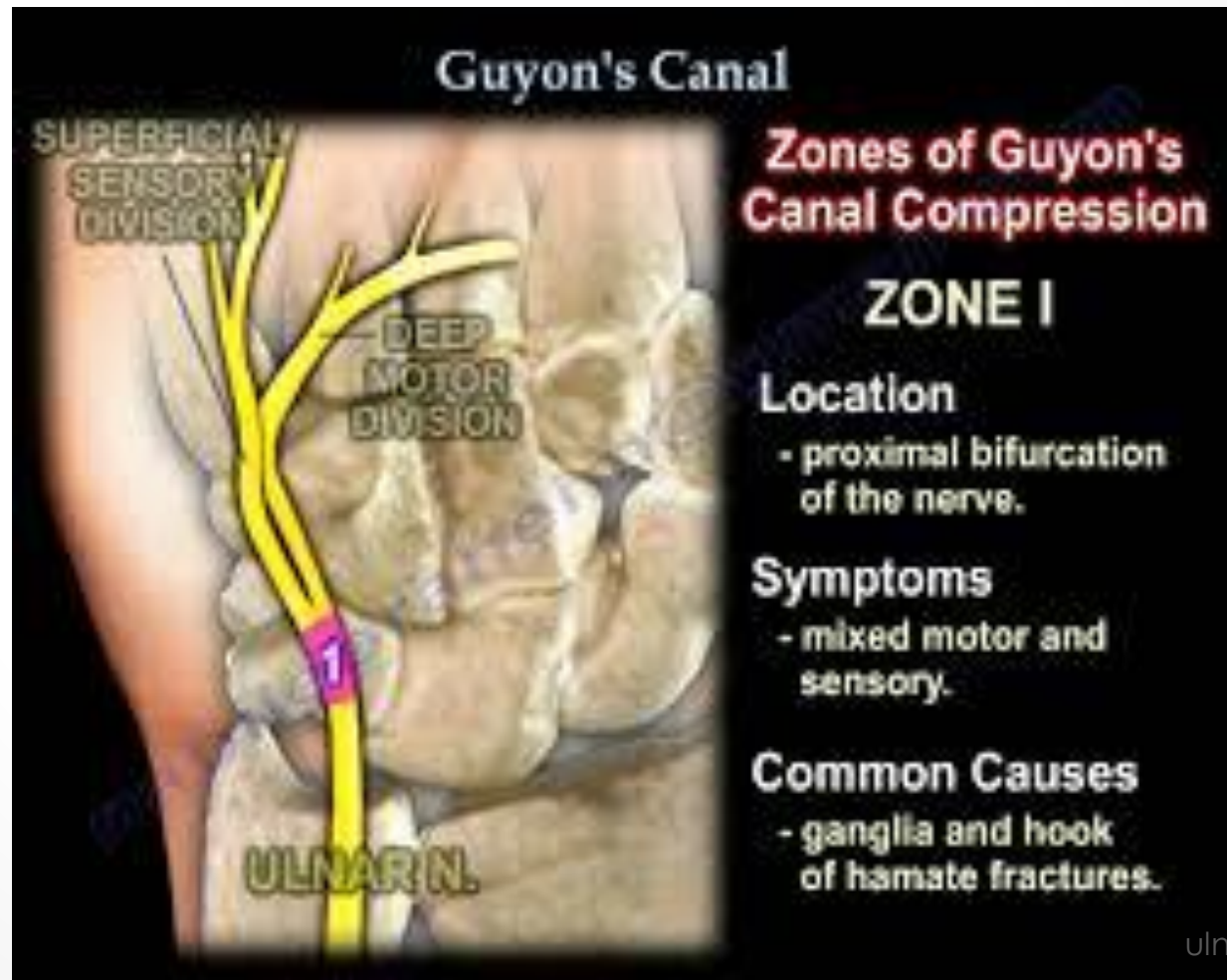


Figure 52-7 Neural mobilization for cubital tunnel syndrome (*highly irritable stage*). **A**, Step 1: Patient performs ipsilateral scapular elevation and cervical sidebending as the wrist and ring and small fingers are extended. The forearm remains in supination and elbow in extension. **B**, Step 2: The scapula and cervical spine are returned to neutral as the



Ulnar Tunnel Syndrome

Compression @ Guyons Canal



causes

- Space occupying bony or soft tissue lesion: wrist ganglion=most common cause
- Anomalous arching pattern of UN (into FCU sheath)
- Thrombosis of UA
- Oedema secondary to burns, trauma, inflammatory arthritis
- # hook of hamates

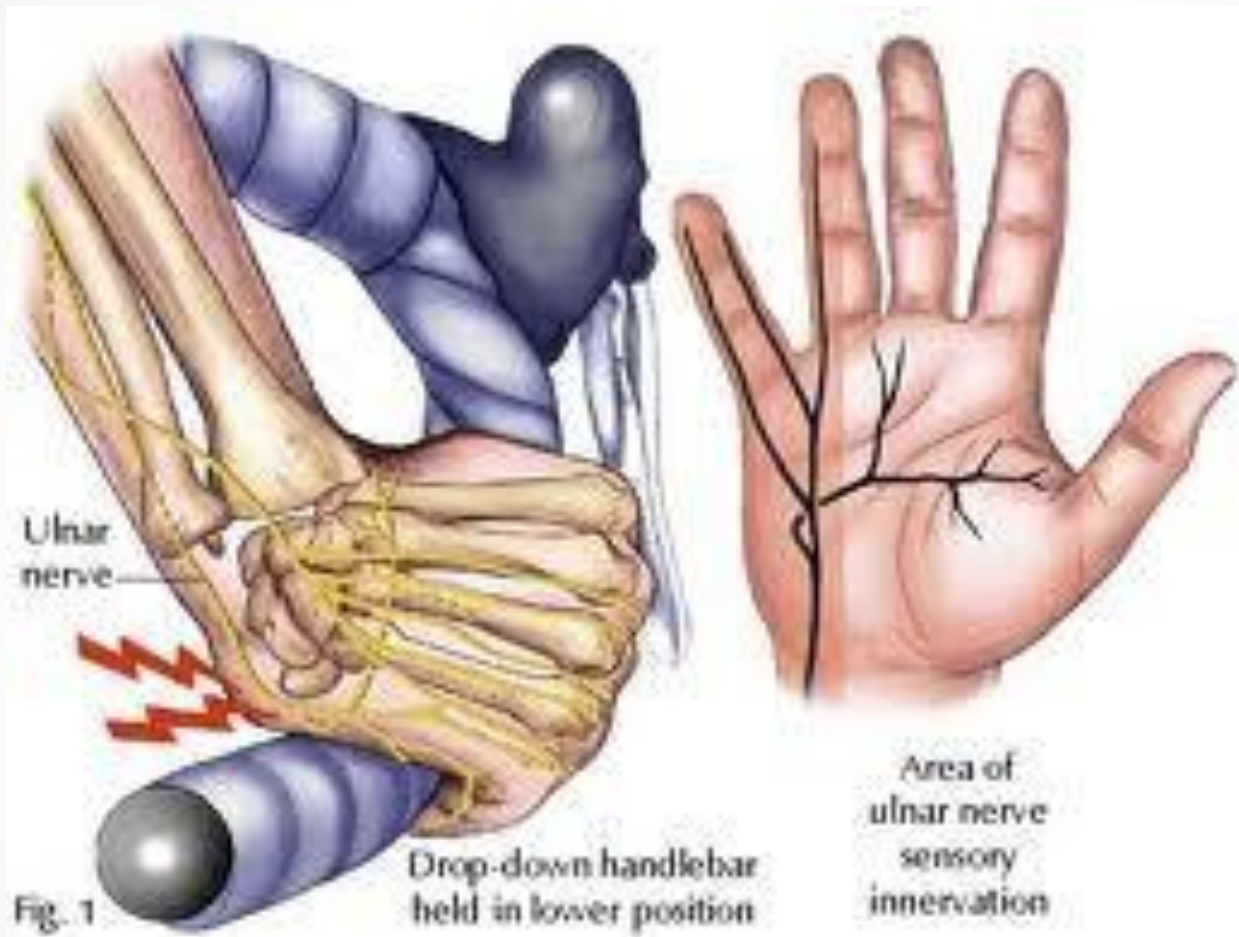


Fig. 1

Drop-down handlebar held in lower position

Area of ulnar nerve sensory innervation

On Examination

- Pain in wrist with numbness, tingling or burning
- Tenderness over Guyon's canal
- Increased with sustained hyperflex/ext of wrist
- Increased symptoms at night
- Presence of swelling, masses
- +/-intrinsic weakness
- Sensory disturbance
- +ve Tinel's
- +ve Phalen's
- Previous trauma (acute or repetitive)
- # hook of hamate

Conservative Management

In absence of an identifiable lesion

- Avoidance and/or alteration of repetitive activities
- Splint immobilisation of the wrist in neutral
- NSAIDS

Operative Management

Recommended for

- ❖ Patient's refractory to conservative care (1-3 months)
- ❖ Documented anatomic lesions
- ❖ Muscle atrophy and numbness

Question1

Handlebar palsy compresses which nerve?

- A. Anterior interosseous N
- B. Median N
- C. Ulnar N
- D. Posterior Interosseous N

Question 2

A patient is diagnosed with cubital tunnel syndrome and receives orders for night splinting. The patient's elbow should be splinted in which position?

- A. 0° of flexion
- B. 30° of flexion
- C. 50° of flexion
- D. 90° of flexion