

HIGH MEDIAN NERVE ENTRAPMENT

It is becoming recognized as a significant cause of the painful upper extremity.

The "high median nerve entrapment" is a compression occurring between its origin and the carpal tunnel.

Many patients with CTS have been found to have a nerve compression at a higher, more proximal level, such as the elbow." There is increasing speculation, although not quantitated, that failure of carpal tunnel surgery is often caused by an incorrect or incomplete diagnosis of the location of the median nerve entrapment.

Although high median nerve entrapments have been reported for many years, there is still a general lack of awareness on the part of many physicians compared with CTS; because it occurs much less frequently, its presentation and physical findings are not as "classic," and electrophysiological investigations are often equivocal.

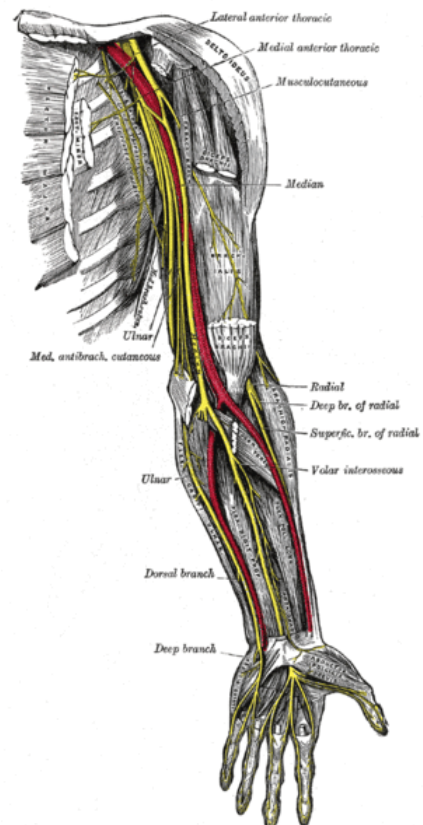
Surgical anatomy

The biceps tendon, brachial artery, and median nerve are arranged from lateral to medial respectively.

The median nerve then passes between the superficial (humeral) head and deep (ulnar) head of the pronator teres muscle.

The median nerve subsequently passes through the arch formed by the two heads of the flexor digitorum superficialis (FDS). It continues distal on the deep (or posterior) surface of the FDS through the mid portion of the forearm.

At the distal third of the forearm, the median nerve emerges from the lateral (radial) aspect of the FDS to enter the carpal tunnel.



Supracondylar "spur"

Spur is present in 3%.

This is an osseous portion arising in the medial supracondylar ridge and gives attachment to the Struther's ligament which joins the medial epicondyle and thus completed the arch. It transmits the median nerve and undivided brachial artery.

The relationship of the median nerve to the pronator teres muscle is extremely variable.

1. Typically, in 82% of people, the nerve courses between the superficial (humeral) and deep (ulnar) heads of pronator teres
2. In 9% of cadaver dissections, the deep head is absent
3. In 7%, the nerve lies deep to both heads
4. In 2%, it passes through the superficial head.
5. 30% had a fibrous arch beneath the superficial head of pronator teres.
6. There are two main types of presentation: (1) communication between nerves (i.e., MartinGruber [M-G] anastomosis) and (2) unusual branching patterns of nerves.



PRONATOR SYNDROME

Causes

1. Ligament of Struthers
2. Tight or thickened lacertus fibrosus-
3. Fibrous band within the pronator teres
4. Proximal edge of FDS- "sublimis arch"



Clinical Presentation

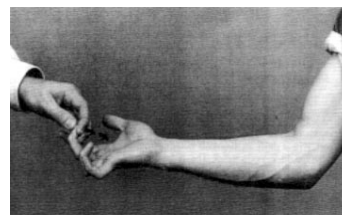
1. It usually presents in the fifth decade and is four times more common in women.
2. The symptoms are insidious in onset. Delay in diagnosis ranging from 9 months to 2 years.
3. Complains of aching pain in the proximal volar forearm. Pain may radiate proximally, and is often aggravated by use of the upper limb, especially with resisted forceful pronation .
4. Usually associated paresthesias
5. Atrophy of the forearm musculature is uncommon.
6. Tinel's sign over the median nerve at the level of the pronator teres is frequently positive
7. Motor weakness is also extremely variable and difficult to quantify:
8. **Provocative test:** Pronator teres-resisted pronation of the forearm (in neutral position) with symptoms being reproduced as the elbow is gradually extended

Pronator teres causing entrapment:

Test for compression of median nerve by pronator teres. : Resisted pronation (forearm neutral) with symptoms reproduced as the elbow is gradually extended

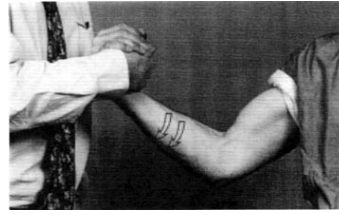
FDS causing entrapment

Put FDS in to contraction provokes pain



Test for compression by lacertus fibrosus.

Resisted flexion of elbow in forearm in supination



Electrodiagnostic Investigations

1. Slowing of nerve conduction between the wrist and elbow is neither specific nor diagnostic
2. CTS may have slowing of median nerve conduction for a variable distance proximal to the wrist.
3. In pronator syndrome may show denervation potentials median nerve-innervated-muscles.

Treatment of Pronator Syndrome

Nonoperative Treatment

Avoidance of aggravating activities, nonsteroidal anti-inflammatories are often beneficial.

Resistant cases require surgery.

Surgical Treatment

Anterior approach for elbow

The lacertus fibrosus is completely divided along its length

Struther's ligament is present, it is excised.

The median nerve is identified entering the pronator teres. The "safe side" of the nerve is the radial side.

Release the superficial head of the pronator from the origin.

The FDS tendinous arch, if present, is readily visible and divided.

At this point, the median nerve and anterior interosseous nerves should be well visualized

Free of any constricting structures.

Pronator teres Vs CTS: Differences

No nocturnal pain in pronator syndrome

Negative Tinel's sign at wrist in pronator syndrome

Nerve conduction study-no delay at wrist in pronator syndrome

Dysesthesia in palmar cutaneous distribution in pronator syndrome

ANTERIOR INTEROSSEOUS NERVE SYNDROME [Kiloh and Nevin syndrome]

Common nerve involved in supracondylar fracture

Presentation

The AIN syndrome is a pure motor palsy that classically presents with weakness or paralysis of the FPL, FDP of index or long fingers, and PQ.

“O” sign

Ask the patient to make zero with thumb and index

finger. If present means FDP and FPL are intact

In there is no flexion at thumb or index means both

FPL and FDP of index not working [supplied by

anterior interosseous nerve



Causes

Trauma

Fractures (supracondylar humeral fractures, forearm fractures)

Dislocations-of elbow, stab wounds Crush injuries

Compression

By pronator teres, FDS arch

Anomalous course deep to pronator teres

Accessory muscles: Ganzter's muscle (aberrant head of FPQ, FCR,

Enlarged bicipital bursa

Aberrant radial artery

Neuralgic amyotrophy Infection

Treatment

Conservative treatment be carried out for 6 months.

Operative Treatment

The operative treatment for anterior interosseous syndrome is essentially the same as for pronator syndrome..

