

PROXIMAL NERVE COMPRESSION SYNDROMES

Median nerve

Pronator syndrome

Diagnosis Can be confused with carpal tunnel syndrome
Phalen's and reverse Phalen's test negative
Absent Tinel sign at wrist
Nerve conduction studies normal at wrist
Palmar triangle dysaesthesia over the thenar eminence diagnostic

Aetiology a. Ligament of Struthers
b. Lacertus fibrosis (from biceps)
c. Pronator teres (hypertrophy of deep surface fascia)
d. Subliminis arch

Signs a. Resistance against active flexion of forearm at elbow
b. Resisted pronation of forearm with elbow flexed
c. Resisted pronation of forearm with elbow extended
d. Flexor digitorum superficialis to the middle finger

Anterior Interosseous syndrome

Anatomy AOIN is motor to FPL, FDPi.ii and PQ

Symptoms Pain
Weakness of pinch

Signs No sensory signs
Inability to make "o" signs with thumb and index finger

Aetiology Tendinous bands on pronator teres of FDS
Accessory muscles, superficialis or profundus
Gantzers muscle (accessory head of FPL)
Palmaris profundus
FCR brevis
Aberrant radial artery
Thrombosis of ulnar collateral vessel

Surgery

Position Supine
Tourniquet
Nerve stimulator.

Incision 10 cm above elbow medial side biceps (feel artery).
Transverse across cubital fossa
10cm below elbow curving gently medially.

Procedure Basilic vein and medial cutaneous nerve of forearm superficial.
Identify median nerve proximally lying between medial intermuscular septum & brachialis.
Follow nerve distally. Passes beneath the bicipital aponeurosis. In this region nerve and artery diverge.

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Divide aponeurosis. Nerve passes deep to humeral head of PT.
Watch out for branches to this muscle, which is retracted medially.

Follow nerve distally. Anatomy in region of Pronator can be variable.
Nerve may pass between humeral & ulnar heads, through the ulnar head or even beneath it. The AIN may arise early from posterior aspect of the nerve.

If needed divide the humeral head of PT near its insertion for later reattachment and elevate proximally.

Follow median nerve beneath the fibrous arch of FDS. Divide the arch. Look for vessels crossing the nerve and ligate and divide if needed. Look for any accessory muscles.

Reattach PT if divided. Take care not to compress nerve again.

Closure	Subcutaneous layer with Vicryl Skin however you prefer Dressing & bulky bandage. Early movement to prevent adhesions.
For discussion	Transverse approach for AIN decompression. Fine but does not allow more proximal interfascicular dissection as recommended by Nagano. Personal preference is to expose the median nerve from above to below elbow in every case.

Radial nerve

Radial tunnel syndrome

Aetiology	Usually anatomical abnormalities Fibrous band tethering nerve to radio-humeral joint Extensor carpi radialis brevis Radial recurrent fan of vessels (Leash of Henry) Arcade of Frohse (deep fibrous band on the surface of supinator)
Symptoms	Pain in extensor mass with use of hand (eg. using a screwdriver) Can be confused with tennis elbow No motor or sensory signs
Examination	Tenderness in the line of the radial nerve Middle finger test to test ECRB Resisted supination EMG unreliable
Treatment	Diagnosis suggested by clinical examination then explore

Posterior interosseous syndrome

Aetiology	As for radial tunnel syndrome
Trauma	Dislocation of elbow, Monteggia fracture
Inflammatory	Rheumatoid arthritis of radiohumeral joint
Swellings	Ganglion, lipoma, fibroma
Iatrogenic	Injection for tennis elbow

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Symptoms	Pain Loss of wrist extension
Signs	Weakness and paralysis Patient can extend wrist weakly and deviate it radially. Brachioradialis and extensor carpi longus MCPs only able to extend to 45° (due to intrinsics)
Diagnosis	EMG shows denervation of paralysed muscles
Treatment	Surgical decompression
Surgery Approaches	Anterior (Henry) Posterior (Thompson) Brachioradialis splitting (Lister) Split between BR & ECRL
Pros & Cons	Anterior gives good access to nerve above the elbow but poor visualisation of distal part PIN. Posterior approach gives good view of distal PIN and nerve in supinator but not proximal nerve. BR split cosmetic. Gives good access to nerve in supinator BR & ECRL split gives good access both ends. Requires elevation of ECRL & B as a mobile wad. Injury to muscle branches.
Position	Arm supinated Tourniquet. Nerve stimulator
Procedure	5 – 10cm above lateral epicondyle, curve medially at elbow and then gently laterally across brachioradialis. Proximal end of wound identify interval between the brachioradialis laterally & biceps, brachialis & pronator medially to find the radial nerve in this interval. Follow nerve proximally to look for compression by lateral head of triceps. Follow nerve distally beneath brachioradialis to demonstrate division into superficial radial nerve & PIN. Look for proximal edge of supinator called arcade of Frohse. At this point allow brachioradialis to sit back over the nerve and slightly pronate the forearm. Split the fibres of BR aiming for the radial head. This will bring you down onto supinator. Identify the arcade of Frohse, split the superficial head of supinator to expose the PIN from proximal to distal.

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- Closure Subcutaneous layer with Vicryl
Skin however you prefer.
Dressing & bulky bandage.
Early movement to prevent adhesions.
- Avoiding difficulty Always identify the muscle anatomy prior to developing any intervals.
Sometimes it is easier to do this starting distally by identifying the
tendons and then following them proximally so that the interval
between the muscles is easier to find.