

### Causes

- Viscera (Heart)
- Vascular disorders
- Cx Spine (referred/radicular)
- Upper limb plexopathies
- Peripheral nerve entrapments
- MSK disorders
- T4 syndrome

**Brachial Plexopathy:** Pain + weakness radiating into the supraclavicular region + upper extremity

**- Causes:**

Compression of the plexus (TOS)

Apical Lung Tumour (C8, T1 - Atrophy of the hand)

Direct Trauma (Burner/Stinger)

### Serious Disorders

- Angina
- MI
- Apical lung tumour (Pancoast's)
- Bone Tumours
- Septic Arthritis
- Osteomyelitis
- CRPS

### Pitfalls

- Entrapment syndrome of the peripheral Nerves
- TOS
- Lesion of Brachial Plexus

### Referral

- Myelopathy and persistent radioculopathy
- Unresolving peripheral nerve entrapments
- Conditions not responding to treatments
- Non-mechanical causes



### Hx & Exam

#### Hx:

- Hx of pain, trauma
- Onset
- Aggravating/Relieving

#### Exam:

- MSK Assessment of the upper limb
- Cx Spine and TOS routine
- SMR
- ROM
- Palpation
- Percussion/vibration (if trauma)

### Investigations

- X-rays
- FBC
- ESR/CRP
- Nerve conduction Studies
- Electromyography
- Ultrasound

[Guidelines Here](#)

### Arm Pain in Children

- Trauma - elbow
- In neonate , consider: Erb's/Klumpke's palsy

### In elderly

- T4 syndrome
- Upper limb peripheral nerves
- Brachial Plexopathies
- CRPS
- PMR
- Myofascial pain syndrome



### Tunnel Syndromes

#### Types:

**Neuropraxis:** Segmental block of axonal conduction due to local demyelination

- causes conduction block (Sunderland Grade 1)

**Axotmesis** - loss of axon with continuation of myelin sheath - Wallerian degeneration of distal nerve

- loss of axon continuity, intact endoneurium (Sunderland grade 2)

**Neurotmesis** - Axon and connective tissue sheath destroyed - severe, leads to Wallerian degeneration, but less chance of regrowth

- loss of axon continuity, Disrupted endoneurium, intact perineurium (Sunderland Grade 3)

Above + disrupted perineurium + intact epineurium (Sunderland Grade 4)

- Complete Nerve Transection (Grade 5)

### General S&S

- Transient Ischaemic symptoms/paraesthesia and numbness (Compression of neurovascular bundle)

- Chronically - pain, numbness, paraesthesia and paresis

- Dyesthesia may be present

- If mixed nerves are affected, sensory signs appear before motor

**Negative Symptoms:** Loss of conduction - Hypaesthesia (reduced sensitivity to a stimulus)

Hypalgesia - Decreased sensitivity to cutaneous pain

**Positive Symptoms:** Caused by an imbalanced input

Paraesthesia - abnormal sensations

Dysaesthesia - unpleasant abnormal sensations

Hyperaesthesia, Hyperalgesia, Hyperpathia, Allodynia

### Testing

SMR, Autonomic symptoms

Nerve palpation

Tinel's sign

Neurodynamic tests (upper tension tests)

Tunnel compression tests

Contraction of muscle tissue bordering a tunnel

### Further Tests

- EEG



### DDx

- Radiculopathy
- Proximal Lesion (TOS)
- CNS Lesion/disease
- Diabetic/alcoholic polyneuropathy
- Vascular disorders causing vasospasm

### Management

- Rule out sinister causes
- Identify aggravating factors (rest/modify activities)
- Mobilisation and manipulation to improve extremity joint function - "open" sites of compression
- Cryotherapy (decreases oedema + inflammation)
- Interferential therapy
- US (reduces oedema + adhesions)
- Stretching techniques and exercises
- SMT
- Ergonomic advice
- Heat in healing phase
- Vitamin B6
- NSAID advice (pharmacist)
- Neurodynamic mobilisation

### Median Nerve entrapment (C6-8, T1)

Can occur at:

- High median Nerve Tunnel (CTS)
- Supracondylar Spur and Ligament of Struther's
- Pronator Teres
- Anterior interosseous nerve tunnel syndrome

### Ligament of Struthers

- Pain and tenderness above the elbow
- Weakness of pronation, wrist/finger flexors
- Clumsiness
- Possible sensory changes in palm
- Refer to x-ray (bone spur on anterior humerus)



### Ulnar nerve (C7-8,T1)

Can Occur at:

- Cubital Tunnel
- Flexor Carpi Ulnaris
- Guyon's canal

### Radial Nerve

Can occur at:

- High radial Nerve Tunnel syndrome (axilla and spiral groove)
- Distal to the radial nerve hiatus (near lateral humeral condyle)
- Supinator
- Syndrome of superficial branch of radial nerve
- Distal posterior interosseous nerve syndrome

### Causes:

- F# of humerus
- Crutch Palsy
- Saturday nigh palsy (falling asleep with arm hanging off chair)
- Triceps lesion

### S&S

- Insidious Onset
- Deep pain in posterior part of the forearm
- Gradual Finger Weakness (Can be some wrist weakness - wrist drop)
- Local discomfort at elbow (4 fingerbreadths below lateral epicondyle - helps differentiate from tennis elbow)
- Pain on active supination
- Positive Tinels

### Other Neuropathies

#### Long Thoracic Nerve (C5-8):

Due to external compression; heavy backpack. Paralysis of Serratus Anterior (winging of the scapula, weakness of shoulder flexion/abduction)

**Management:** Decompression, then rehab exercises

#### Suprascapular Nerve (C5-6)

Scapular trauma/fracture or repetitive stretching. Pain and weakness/paralysis of supraspinatous + infraspinatous - mimics rotator cuff

**Double Crush:** Two compressive lesions affecting the same nerve. Look for manipulable lesions at segmental level to the peripheral nerve



### Non-MSK causes of Arm pain

- Skin: Herpes Zoster, Cellulitis, Contusions
- Muscles, joints, tendons, nerves: Inflammation, trauma
- Bones and Joints: Osteomyelitis, primary/mets bone tumours, fracture/inflammation of joints
- Veins: Thrombophlebitis
- Arteries: Ischaemia - risk factors (smoking, hypertension, raised glucose levels, systemic inflammation)
- Heart, lungs, subdiaphragmatic structures (intra-abdominal bleeding, gall bladder) can refer down the arm
- IHD Risks - Increasing age, Male, Family Hx, Race (south asians higher risk), Hypertension, DM, Hyperlipidaemia, Obesity
- IHD S&S: Constricting discomfort in the front of the chest, neck, shoulders, jaw or arm, Precipitated by emotion/exertion, relieved by rest/ GTN

### Questions

- Pain related to exertion and relieved by rest? Effort over movement? Risk factors for IHD/Cardiac
- Recent Viral infection? Pain affected by positioning/breathing?
- Cough? SOB? Wheeze? Haemoptysis? Smoker? Breathing exacerbate problem? Symptoms of infection? Hx of cancer
- Intolerance of fatty foods? Indigestion?



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