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

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Hx & Exam

Hx:

- Hx of pain, trauma
- Onset
- Aggrevating/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/Klumke's palsy

In elderly

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

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Tunnel Syndromes

Types:

Neuropraxis: Segmental block of axonal conduction due to local demyelination
- causes conduction block (Sunderland Grade 1)

Axnotmesis - 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 destored - severe, leads to Wallarian degeneration , but less chance of regrowth
- loss of axon continuity, Disrupted endoneurim, intact perineurium (Sunderland Grade 3)
Above + disrupted perineurim + intact epineurium (Sunderland Grade 4)
- Complete Nerve Transection (Grade 5)

General S&S

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

- Chronically - pain, numbness, parasesthesia and paresis

- Dyaesthesia 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

Parasesthesia - abnormal sensations
Dysaesthisa - 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

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DDx

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

Management

- Rule out sinster 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 techhniques 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)

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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

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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?

By **Siffi** (Siffi)
cheatography.com/siffi/

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