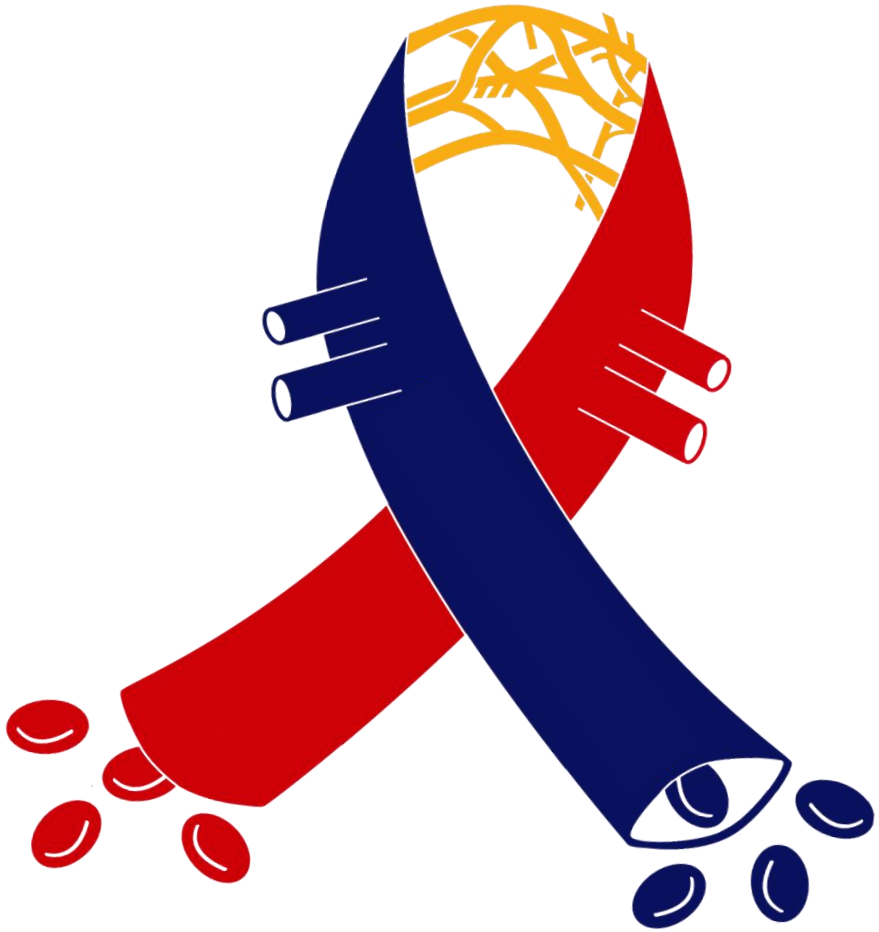
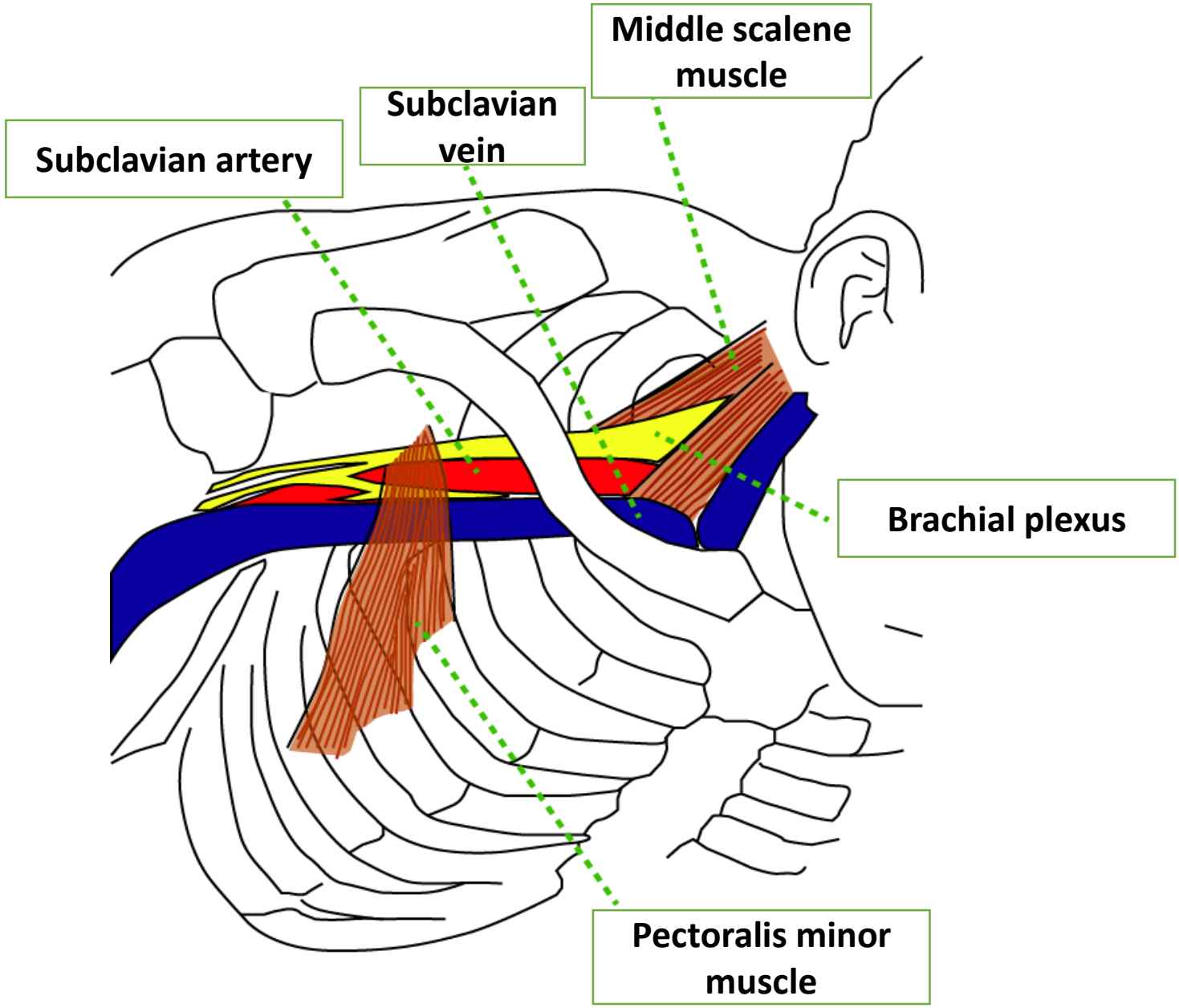
Thoracic Outlet Syndrome



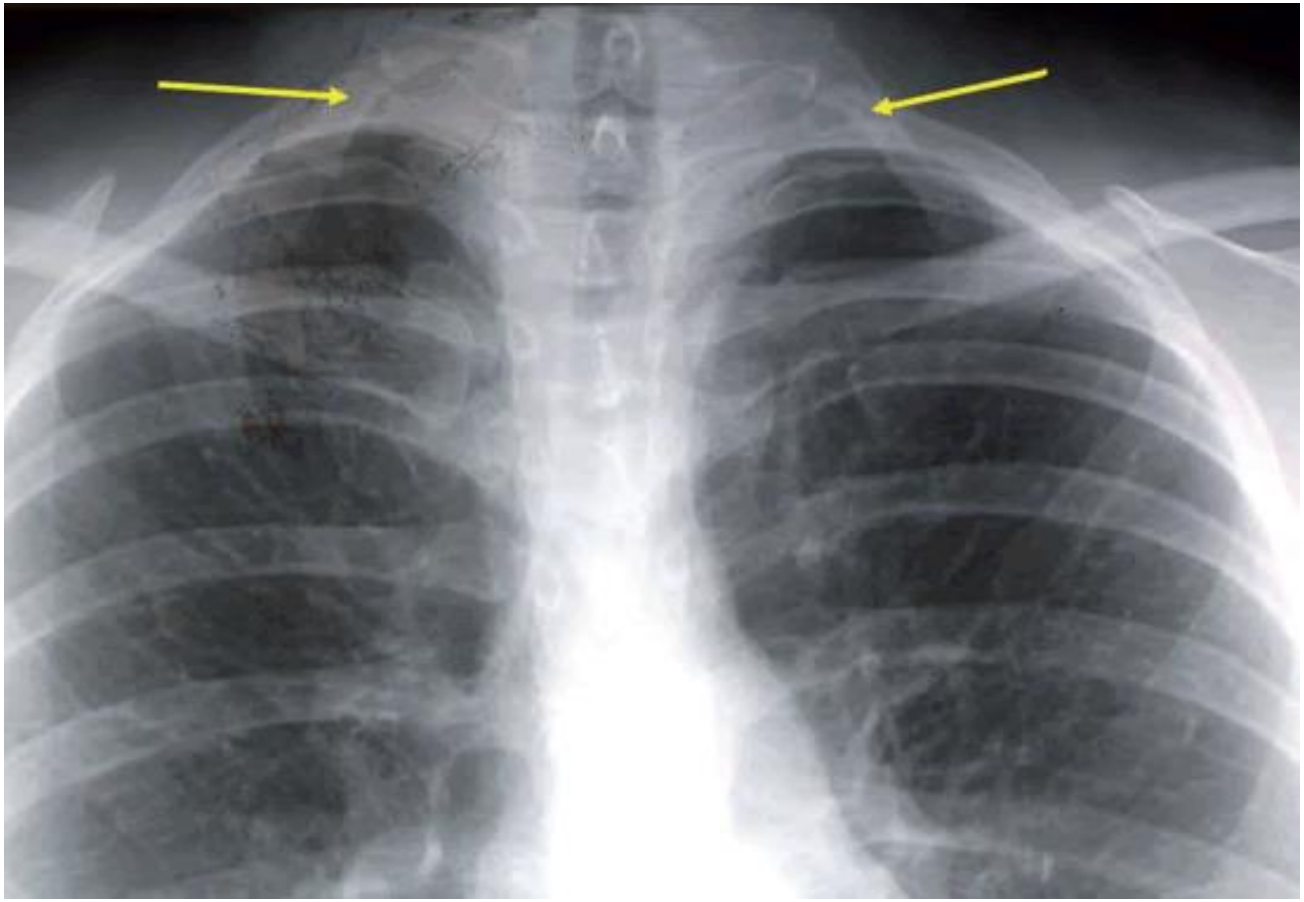
Thoracic outlet syndrome

- Spectrum of symptoms resulting from the compression of the neurovascular bundle as it leaves the chest to enter the upper limb, in an area enclosed by the first rib, clavicle, and the scalenus anterior muscle.


Middle scalene muscle
Subclavian vein
Subclavian artery
Brachial plexus
Pectoralis minor muscle

Causes

- **An anatomically tight thoracic outlet and compression occurs between 1st rib and clavicle.**
- **Hypertrophy of the scalene muscles.**
- **Cervical rib (present in <1% of population).**
- **Fibromuscular band (from C7) .**
- **Clavicle or 1st rib fractures or exostoses.**



Bilateral cervical rib

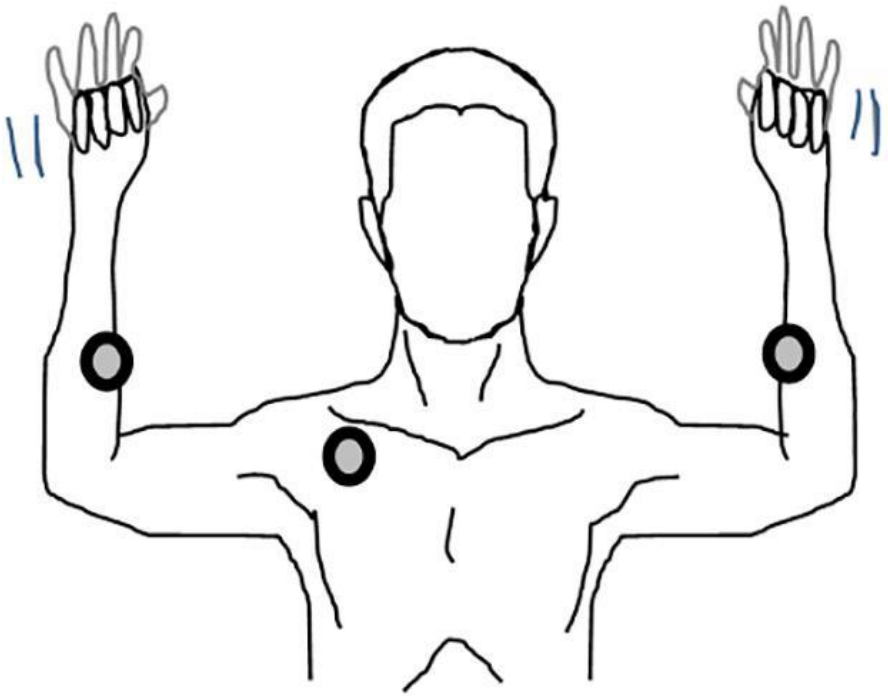
Clinical features

1. Symptoms

Neurological	Arterial	Venous
• More common • Sensory and motor deficit in the distribution of C8/T1 • Exacerbated by movement or arm position and tend to be worse at night	• Less common • Claudication • Rest pain • Distal arterial disease may be due to embolization. • Raynaud's phenomenon	• Venous hypertension

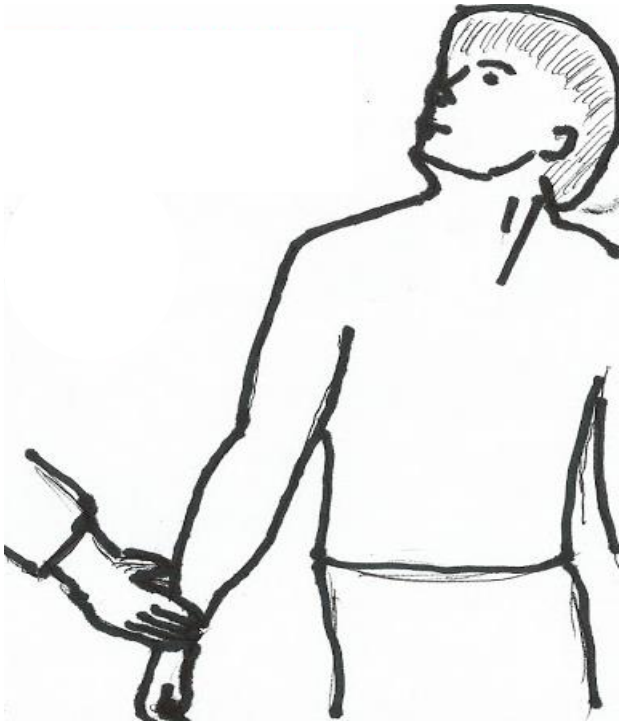
2. Signs

- Examine bilateral upper limb pulses.
- BP in both arms.
- Wrist Doppler pressures.
- Roos test.
- Adson’s test.
- Allen’s test.
- Tinel’s test.



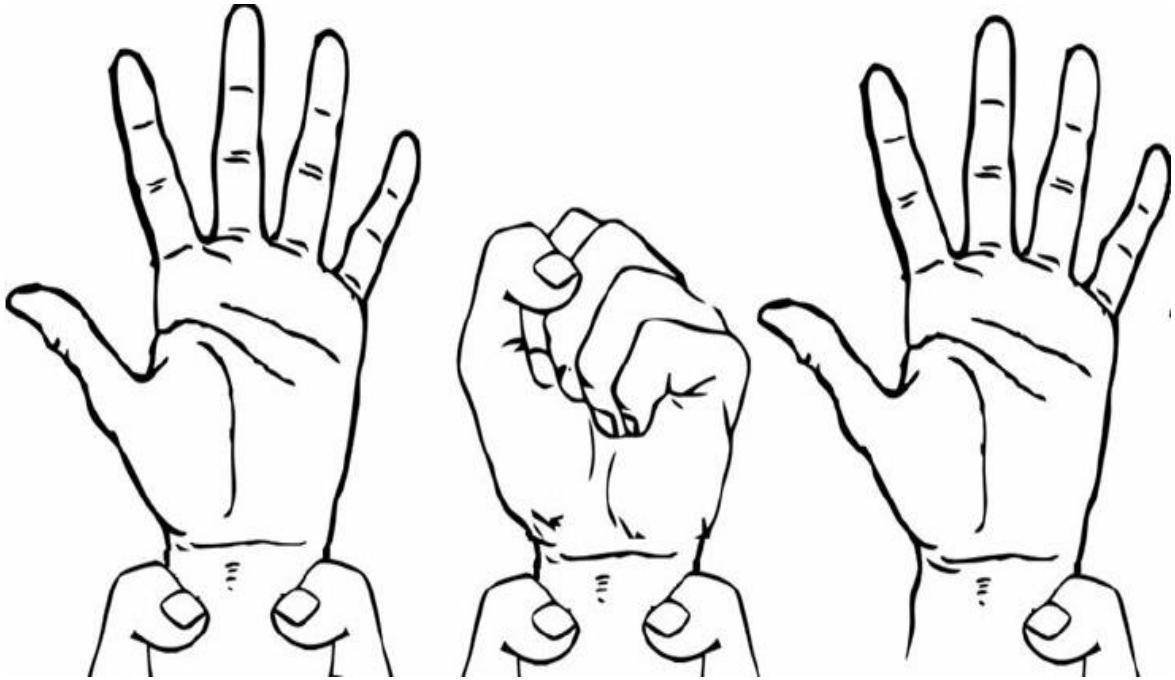
Roos test

Arm abducted to 90*, hands up with elbows braced backward, chin elevated, hands serially clenched/opened for 1–2min, positive if pain or weakness in hand or forearm.



Adson's test

In a patient sitting on a stool, the radial pulse is felt. Patient is asked to take deep breath and turn the face to same side.
Test is positive if radial pulse disappears.



Allen's test

Assesses integrity of the palmar arch and dominant vessel (radial or ulnar).

Investigations

- **CXR** - Cervical rib.
- **Duplex Doppler** – In positions of provocation, will give more functional information about the impingement on the subclavian artery than will angiography.
- **MRA** - To assess vessel compression (subclavian artery stenosis or constriction by fibrous band).
- **Venography** - compression of subclavian vein or subclavian vein thrombosis.
- **Nerve conduction studies** - Distinguish from carpal tunnel syndrome.

Management

1. Conservative management

- 50% will be benefitted.
- Gentle neck stretching exercise
- Relaxation therapy
- Analgesia
- Physiotherapy

2. Surgery

- Excision of cervical rib.
- Excision of the first rib/band will improve symptoms in over 90%.
- Scalenotomy.
- Aneurysms may need to be resected and repaired.