Thoracic Outlet Syndrome

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Objectives

- Define
- Explain It
- Clinical Work-up/Treatment
- OMT

WHY TOS??

- Pregnant Lady

WHY TOS??

HS Adam

Threat Level: Orange

Repetitive Motion
- Abduction/External Rotation
- Swimmer, tennis, baseball
- Manual Labor

Edema

Bad Posture

Anatomic Abnormalities
What is the Syndrome?

- Signs and Symptoms of compression of the neurovascular bundle (brachial plexus, sub-clavian A/V) as it passes through the thoracic outlet.

What is the Outlet?
2 Broad Categories
- Vascular
- Neurogenic

Vascular
- Due to stenosis and blood clots
- Compression
- Stenosis/Mural injury
- Clots

Arterial
- Least common form
- Subclavian Artery as passes btwn ant/middle scalene, over 1st rib, under clavicle
- Clots (Mural Thrombi, AVM)
- Presentation: ischemic pain, pallor/Raynauds, paraesthesia in young person lacking atherosclerotic risk factors

Venous
- ~3% of TOS
- Subclavian vein as passes over the first rib, anterior to the insertion of the ant scalene, btwn clavicle and 1st rib
- DVT (Paget Schroetter) or iatrogenic
- Presentation: edema, aching, cyanosis, venous distension of upper chest/shoulder

True Neurogenic
- Also really, really rare
- Compression of the Brachial Plexus
- Usually a bony abnormality
- Presents with: unilateral atrophic weakness of intrinsic hand muscles, difficulty grasping objects, sensory loss/paresthesia. No/mild pain
“Disputed” Neurogenic
- 95% of cases
- Unexplained pain in the arm, scapular region, and cervical region.
- Symptoms begin after a traumatic event (e.g., motor vehicle accident).
- Rarely bony abnormality
- Reproducible with sustained use of arms/hands
- Vasculature/Muscles intact
- Under-diagnosed vs over-diagnosed

TOS in Pregnancy
“Congestive” stage during 28-36wks
- Hemorrhoids
- Swelling
- Neurologic sequella
  - Carpal Tunnel Syndrome (CTS)
  - Ulnar nerve entrapment
  - Thoracic Outlet Syndrome (TOS)

Work-Up

Esoteric Examinations
- Good Shoulder/Neck Exam
- Complete Neuro and Vascular Exam
- Tom Neal says
  - Adson
  - Roos
  - Hyperelevation

If You Want...
- R/O inflam/other (ESR, CRP)
- Cancer
- C-spine/upper thoracic x-rays
- MRI
- Angiography (MRA)
- Dopplers/Duplex
Treatment

Surgical vs Conservative

Indications for Surgery

- Thoracic outlet decompression if:
  - Vascular TOS (aTOS, vTOS) not at high risk for surgery.
  - True nTOS w/ progressive neurologic weakness or disabling pain and paresthesia
  - Disputed nTOS that has failed conservative treatment

Not Just for Pamela Anderson

*Colorado Rockies pitcher Aaron Cook always has a spare rib for good luck. It’s not part of his pregame meal. The rib came out of his own body and sits in his locker."

Everyone Else

- Pain Control
- Stretching/Strengthening
- PT
  - Postural balance
  - ROM/decrease hypertonicity
  - Development of balancing muscles
- OMT

Evidence for OMT

- Dobrusin, R. An osteopathic approach to conservative management of thoracic outlet syndromes. JAOA 1989 1046-1057
Thoracic Ducts

Lymph in the thoracic outlet

Figure 48.13. Main lymphatic ducts of body.
Thoracic Inlet release
Pectoral Traction