STERNOCLAVICULAR JOINT

Matt Woronczak

Advanced Practice Musculoskeletal Physiotherapist

Emergency Department, Dandenong Hospital

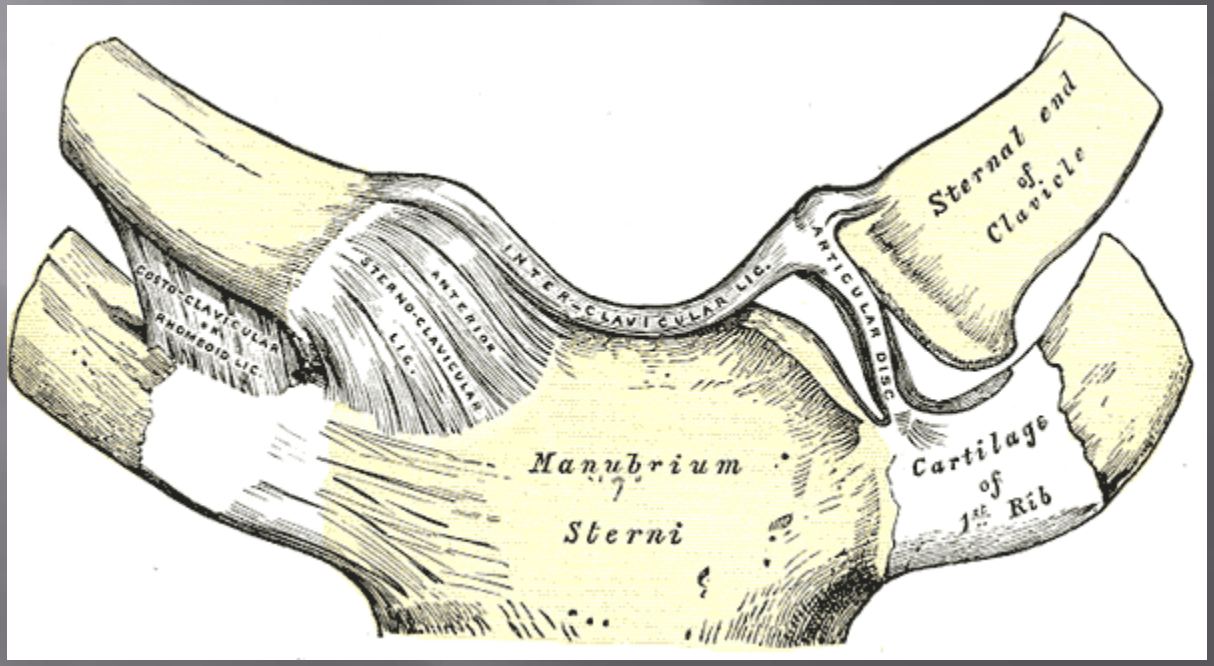
ANATOMY

Sternoclavicular Joint

- Only joint holding the upper limb to the rest of the skeleton
- Classified as a diarthroidal saddle articulation between the clavicular notch of the manubrium and the medial clavicle, as well as a small part of the first costal cartilage
- Joint is incongruent, with < 50% of the clavicle contacting the notch, making it potentially unstable

Sternoclavicular Joint

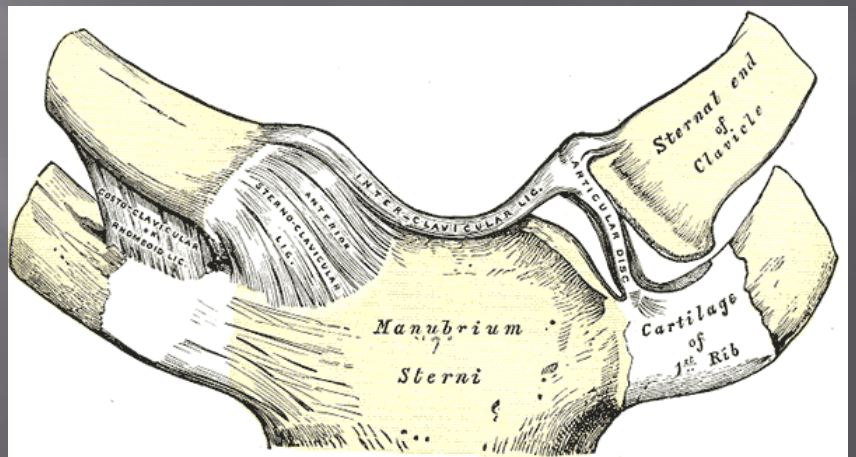
- Reinforced by:
  - Intra-articular disc
  - **Strong** anterior and posterior ligamentous / capsular complex, and the costoclavicular (rhomboid) ligaments



Sternoclavicular Joint

- The posterior capsule is the most important structure in preventing anterior and posterior translations of the medial clavicle

- The disc prevents superior and medial displacement and divides the joint:
  - Movement between the clavicle and the disc occurs during elevation and depression of the scapula
  - Movement between the disc and the manubrium occurs during protraction and retraction of the scapula

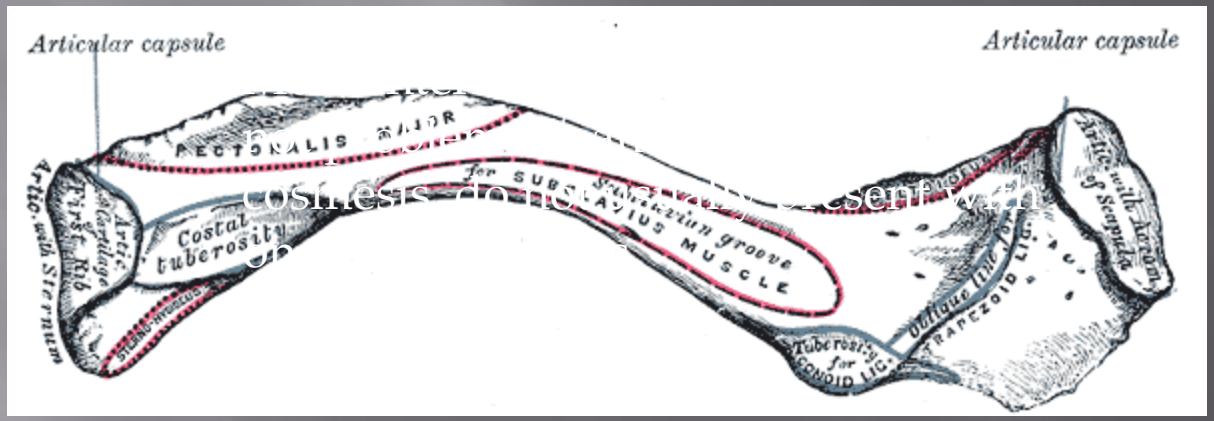


Sternoclavicular Joint

- The clavicle is the first bone to begin ossification, however one of the last to complete it
- Medial clavicle epiphysis appears late (18-20) and is the last of the long bones to fuse (approx 25 years)
- May have physeal injury instead of dislocation

Sternoclavicular Joint

- Muscles don't directly act on this joint, although almost all actions of the shoulder girdle or the scapula will cause some motion at the SC joint



- 3 degrees of movement allowed:
  - Elevation / depression (associated with elevation / depression of the scapula)
  - Protraction / retraction
  - Axial rotation

STERNOCLAVICULAR JOINT DISLOCATIONS

Sternoclavicular Joint Dislocation

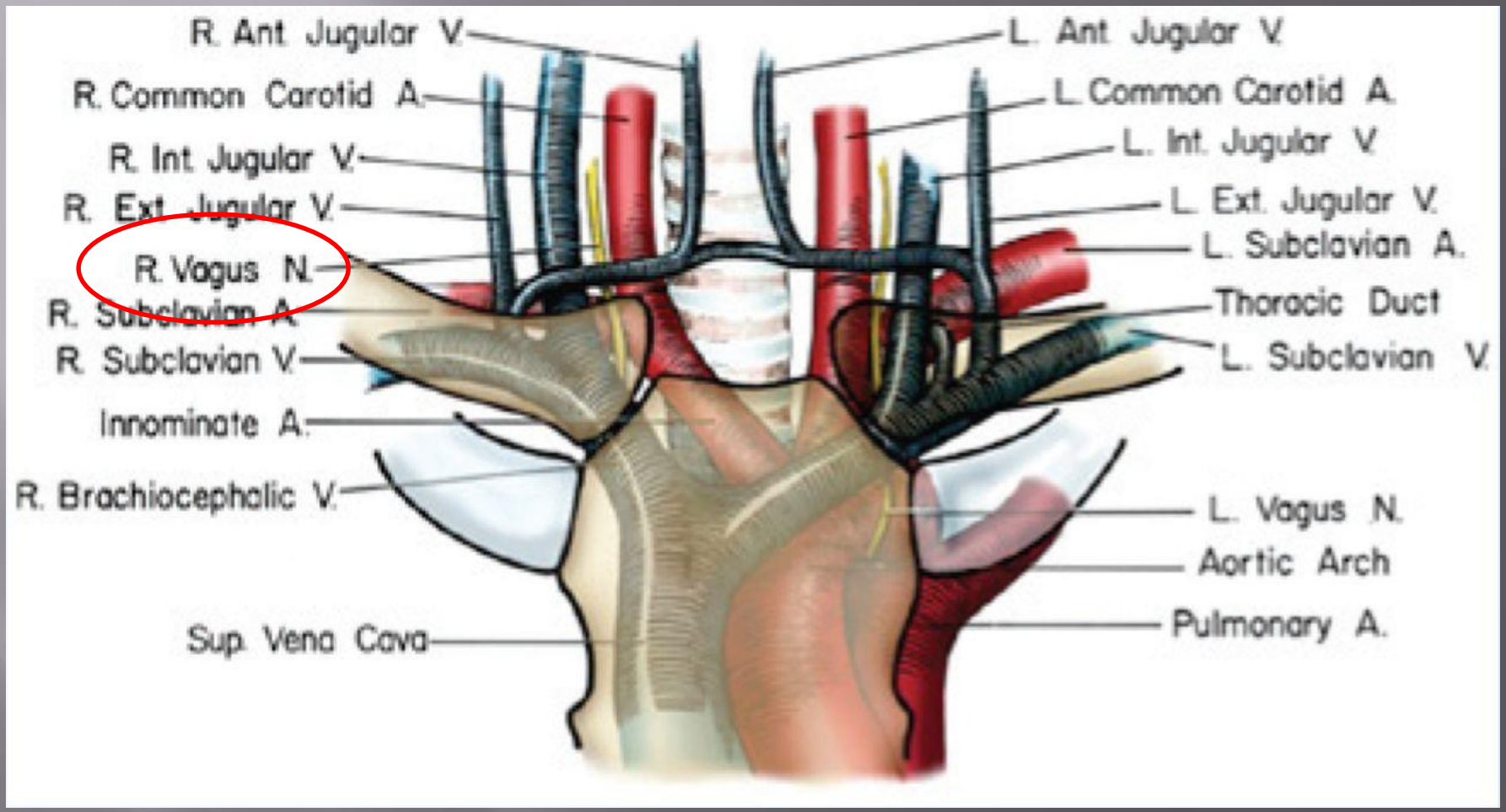
- Rare but potentially serious traumatic injury
- Accounts for:
  - <3% of shoulder injuries
  - <5% of shoulder girdle dislocations
- Anterior dislocation up to 9 times more common that posterior dislocation due to relative strength of posterior capsule in resisting translation in this direction

Sternoclavicular Joint Dislocation

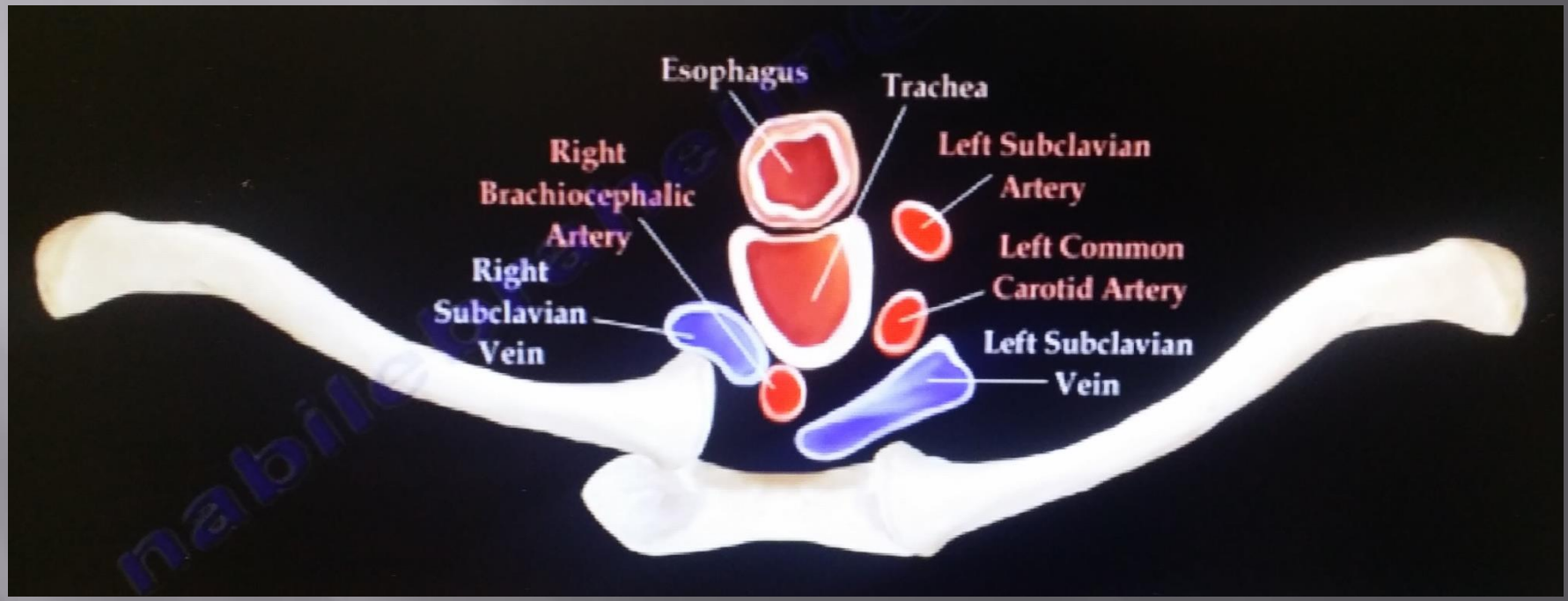
- Most anterior dislocations are usually not problematic and aside from cosmesis, do not usually present with ongoing problems.

- Posterior dislocations are potentially dangerous

Sternoclavicular Joint



Sternoclavicular Dislocation



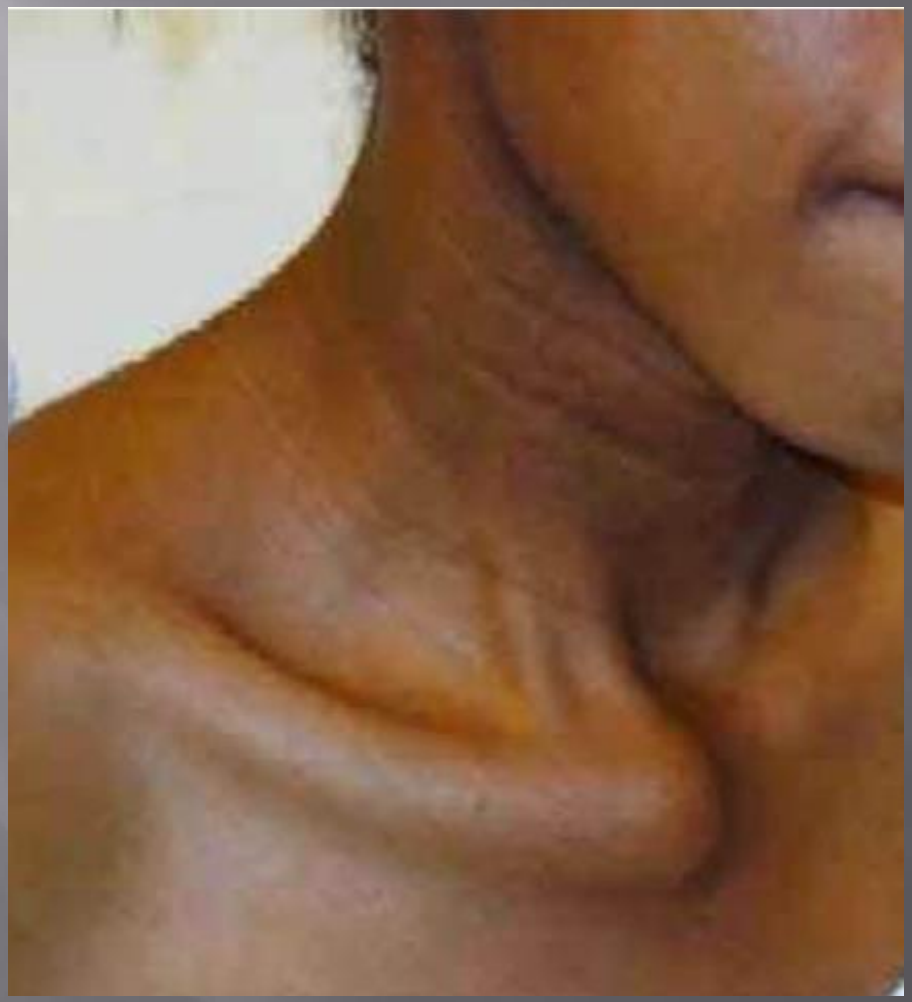
CASE STUDY

Case Study

- 23 year old male
- Playing football – collided with another player = took blow to L shoulder and root of neck
- Triage:

BIBA - L) clavicle pain and deformity post collison with another football player. NV obs - limited ROM. 3mls penthrane, 10mg morphine and now not distressed with pain at triage. BP 120/-, HR 86, SaO2 99%, RR 16, chest clear

Case Study 1



Case Study 1

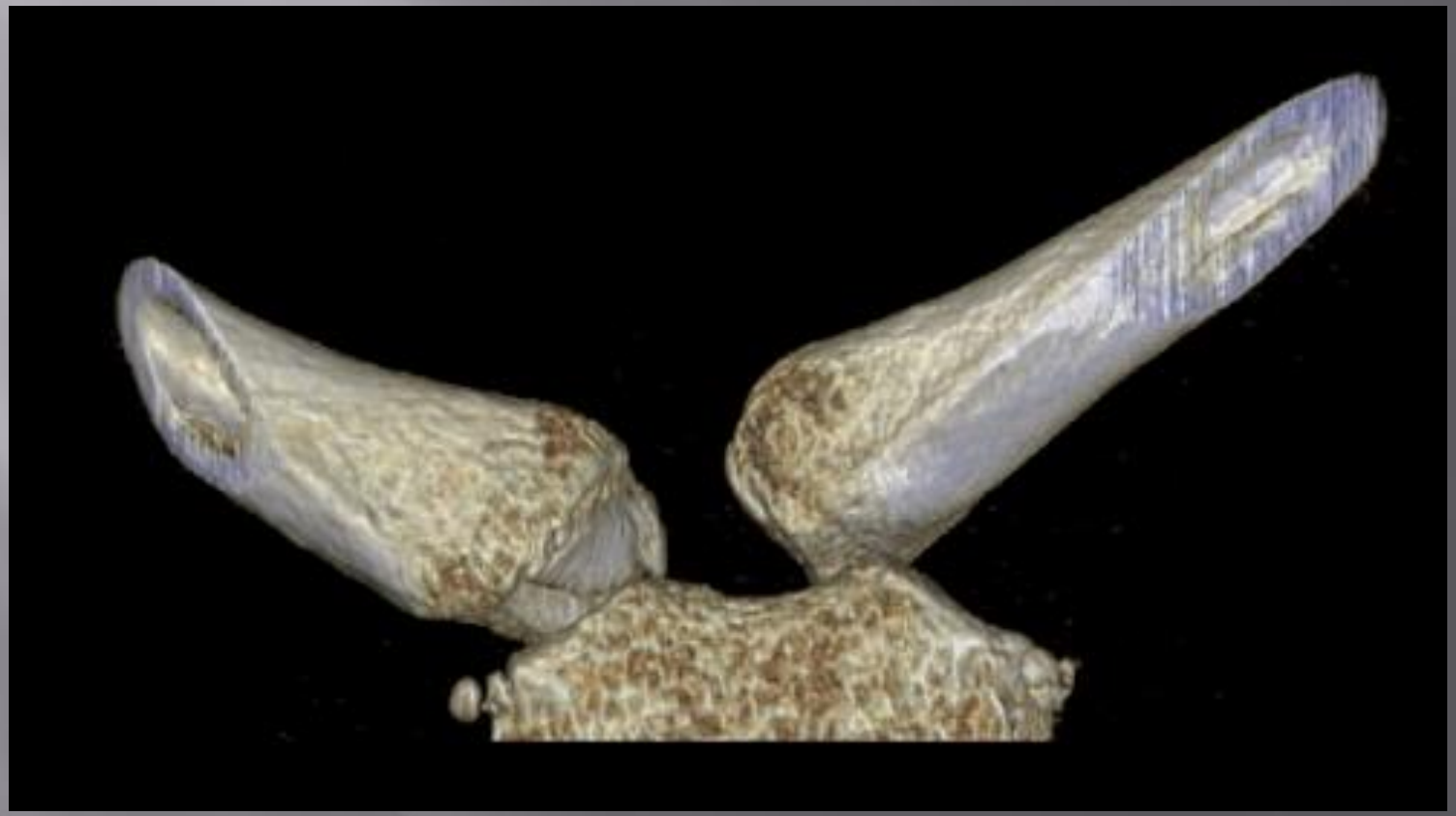
- Subjective
  - L medial clavicular pain >> neck pain
- Objective
  - Obvious lump to medial clavicle / SC jt region – appears to be protruding anteriorly
  - Midline bony tenderness to neck "C5-C7"
  - Tender+++ lump medial end of clavicle
  - Neurovascular function normal
  - Neurological exam
    - Sensation normal
    - Power normal below elbow; unable to test above due to pain
    - Could not assess reflexes on injured side
  - No hoarse voice / respiratory distress

Case Study 1

Case Study 1

Left clavicle
Clinical
Trauma
No fracture or dislocation

Case Study 1



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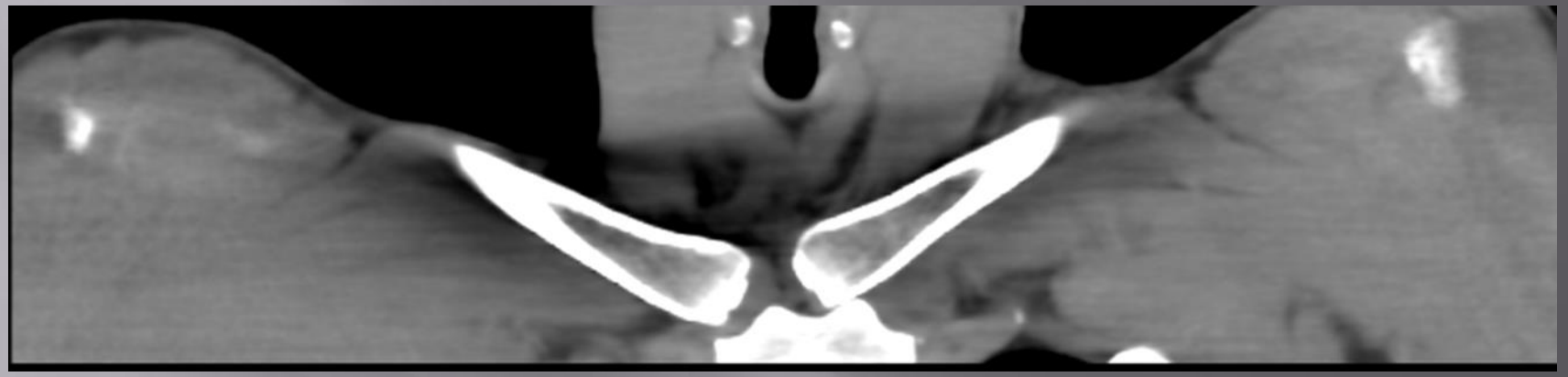

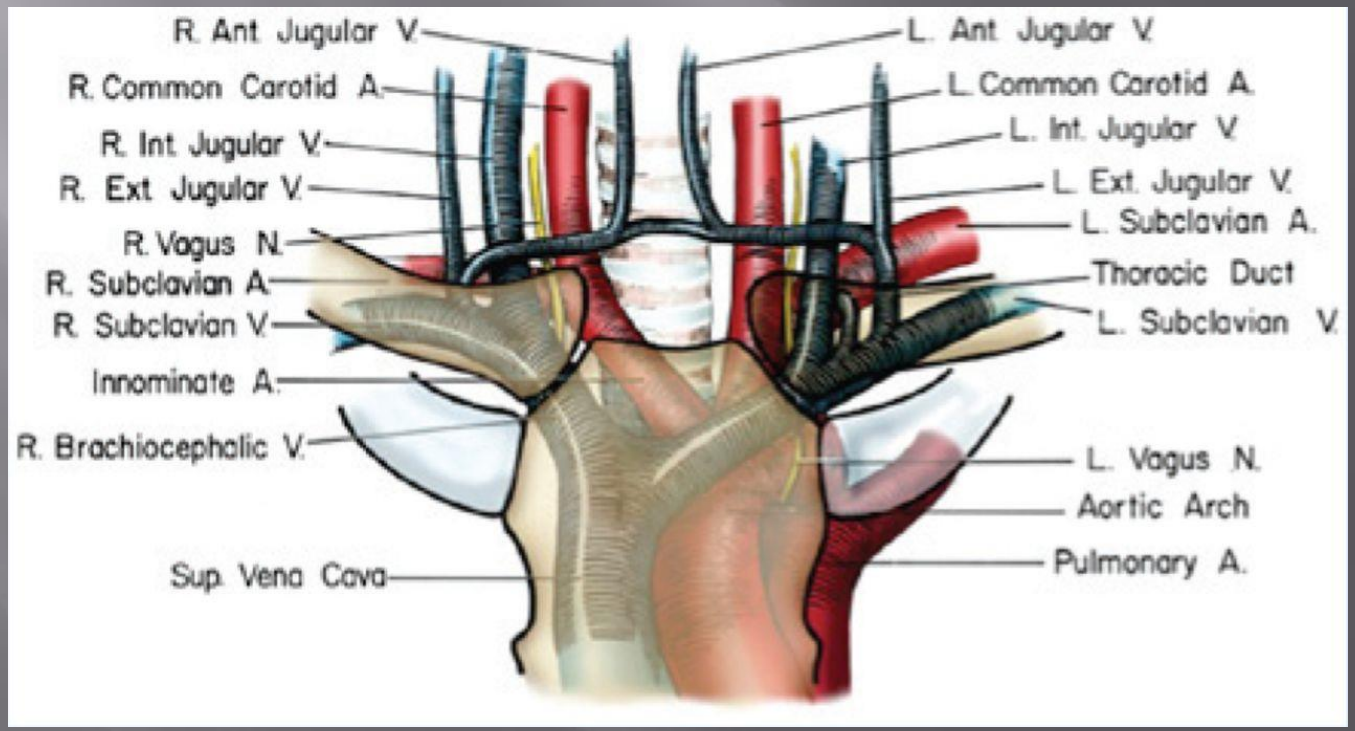
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R. Common Carotid A.
R. Int. Jugular V.
R. Ext. Jugular V.
R. Vagus N.
R. Subclavian A.
R. Subclavian V.
Innominate A.
R. Brachiocephalic V.
Sup. Vena Cava
L. Ant. Jugular V.
L. Common Carotid A.
L. Int. Jugular V.
L. Ext. Jugular V.
L. Subclavian A.
Thoracic Duct
L. Subclavian V.
L. Vagus N.
Aortic Arch
Pulmonary A.

Case Study

- CT
  - Posterior dislocation SC jt
  - T1 spinous process # (no Mx)

- Patient admitted for 4/7, then discharged home and had surgery 9/7 post injury

MORE INPUT

Sternoclavicular Joint

- Retrospective study at the Alfred between 2004-2012 found that
  - 22 patients identified as having a sternoclavicular joint dislocation (on imaging)
    - 17 (77%) having sustained a posterior dislocation
    - 3 superior dislocations
    - 2 anterior dislocations
  - Mechanism
    - Direct blow in sport - 11
    - MVA - 7
    - Fall from height – 2
    - Other - 2

Sternoclavicular Joint

- Retrospective study at the Alfred between 2004-2012 found that
  - Mean time from injury to diagnosis 1.3 days (range 0-17)
    - 1 person presented 17 days post injury with R UL pain, swelling and tingling consistent with thoracic outlet syndrome warranting further investigation
  - Mean time from admission to theatre 46 hours (4.1-215.3)
    - 10 patients went to theatre within 24 hours of presentation

Sternoclavicular Joint

- Retrospective study at the Alfred between 2004-2012 found that
  - 50% of patients had symptoms consistent with compromise to a mediastinal structure
  - Management
    - Directed by the preference and belief of the on call surgeon:
      - SC jt inherently unstable = open reduction with repair as primary management
      - Attempt closed reduction with intra-operative assessment of joint stability
    - 12 had attempted closed reduction in theatre
      - 5 of these failed and required later open reduction and stabilisation
    - 13 patients treated with open reduction and stabilisation
      - 8 as primary treatment and the 5 failed closed reduction
    - 2 patients managed without theatre
      - 1 with multiple co-morbidities
      - 1 without neurovascular compromise who had a physeal fracture / dislocation (Mx in figure of 8 brace)

Sternoclavicular Joint

- Retrospective study at the Alfred between 2004-2012 found that
  - Outcomes
    - Average time of respondents 3.5 years
    - Evaluated with surveys – Subjective Shoulder Value (SSV) and American Shoulder and Elbow Society (ASES)
    - Functional outcomes excellent:
      - Mean SSV = 88%
      - Mean ASES 93.95%

References

- Kirby, J.C., Edwards, E. & Kamali Moaveni, A. (2015). Management and functional outcomes following sternoclavicular joint dislocation. *Injury* 46; 1906-1913

- Norkin, C.C. & Levangie, P.K. (2011). *Joint structure and function: a comprehensive analysis* (5th ed). Philadelphia: Davis.