Scapulo-Thoracic Dissociation

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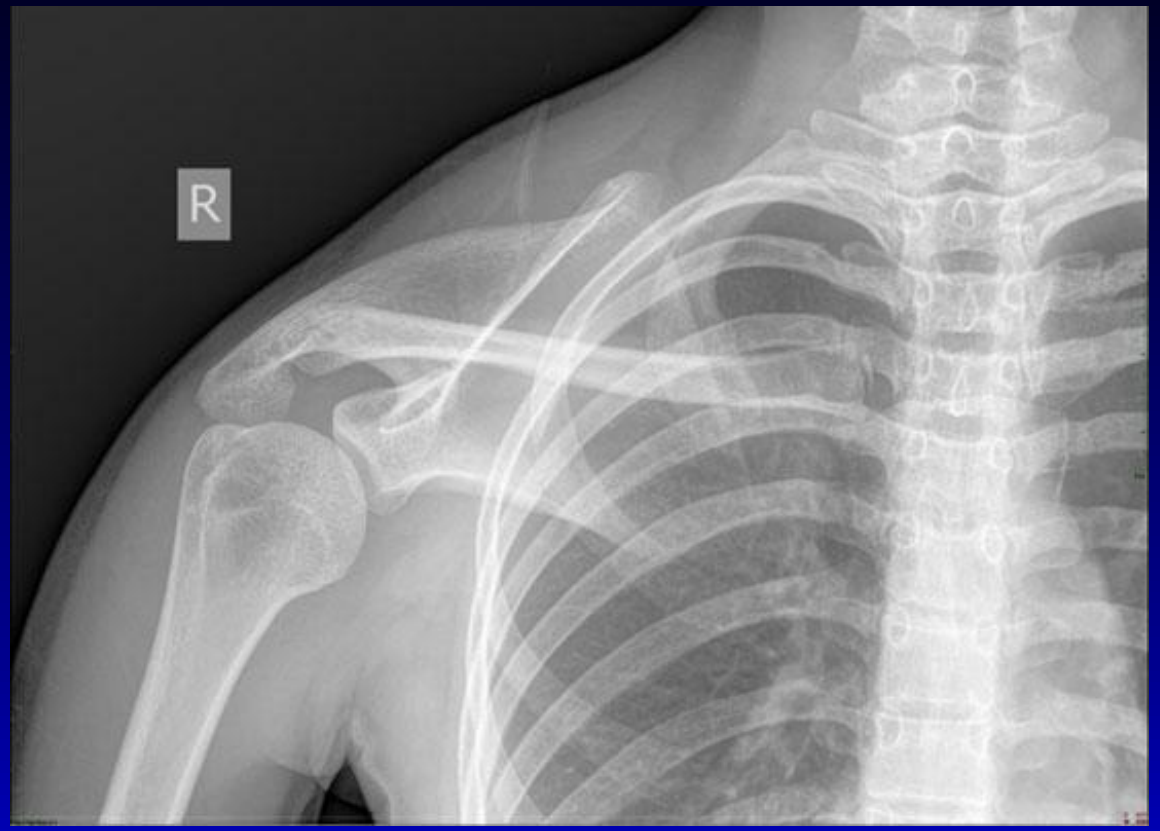

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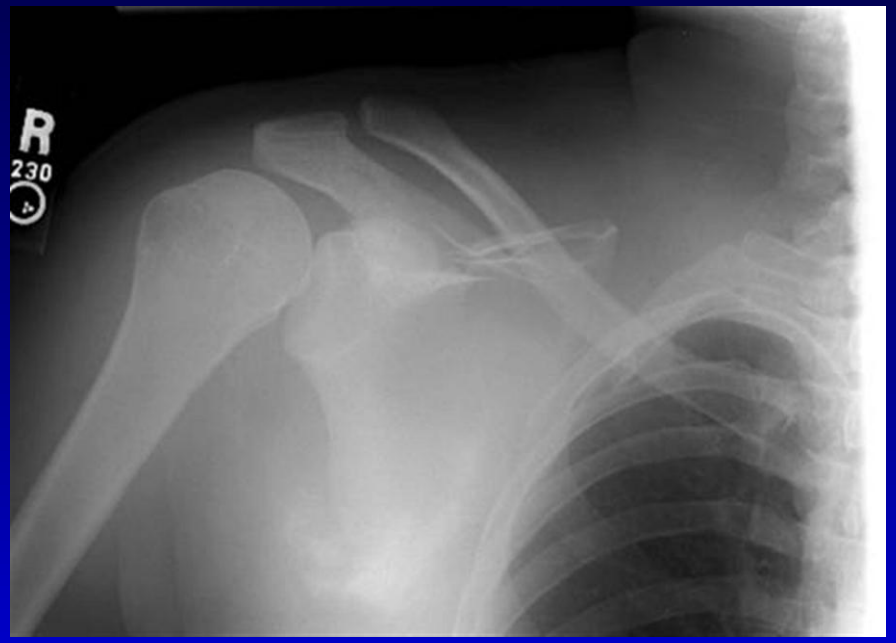
Scapulothoracic Dissociation

- Severe, high-energy injury distraction force
- High incidence of associated injuries
- May be life-threatening
- Prognosis poor



Mechanism of injury

- Motorcycle
- MVC
- Industrial

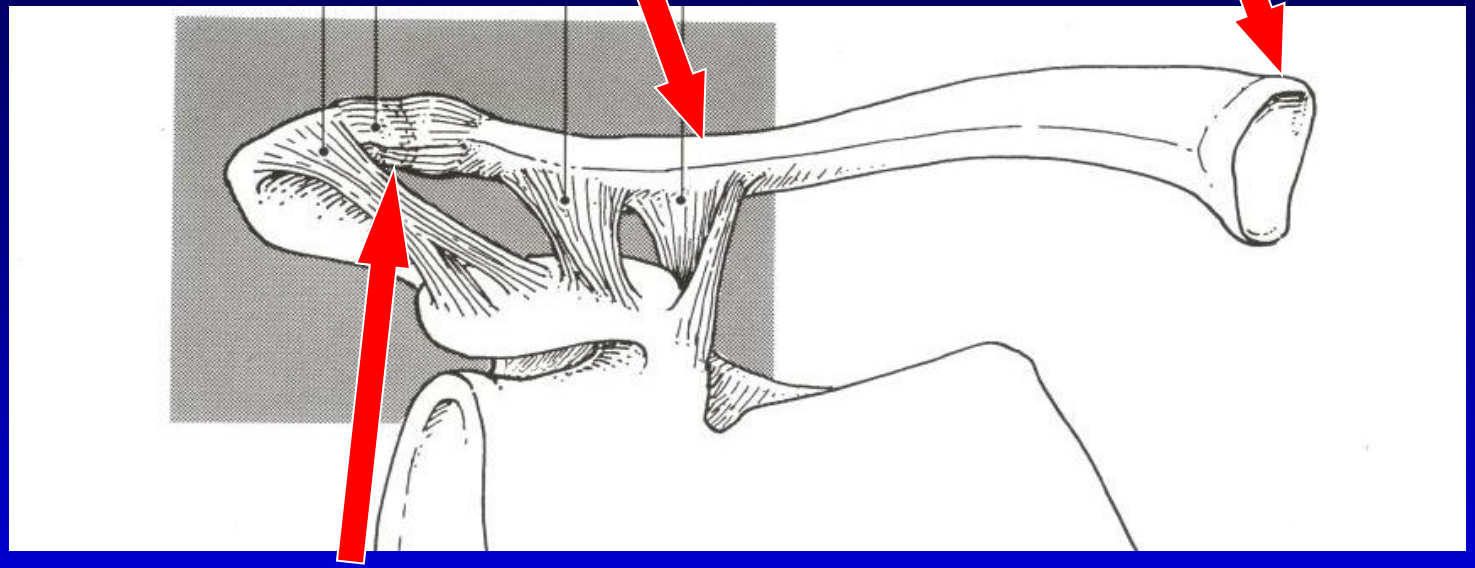
Distraction force

- Anterior separation due to
  - clavicle fracture or AC separation or SC separation
- Tear of various muscles
  - Trapezius, pec, deltoid, latissimus, rhomboid, levator scapula
- Injury to the brachial plexus usually last

Anatomic site of injury

Clavicle fracture

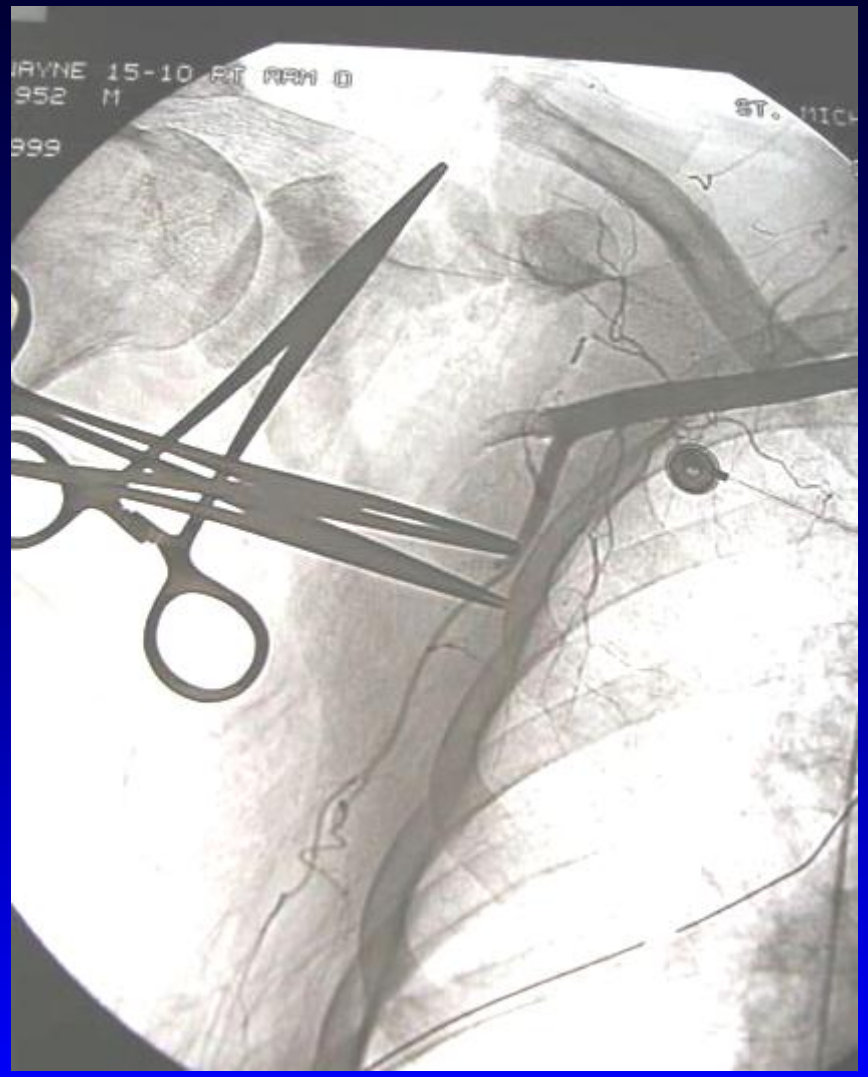
Sternoclavicular dislocation



Acromioclavicular dislocation

Associated injuries

- Brachial plexus
- Brachial artery
- Intra-thoracic
- Ipsilateral U/E fracture (in 41%)



Zelle Classification

1. Isolated musculoskeletal injury

2A. Musculoskeletal and vascular injury

2B. Musculoskeletal + incomplete neurologic injury

3. Musculoskeletal + vascular +incomplete neurologic injury

4. Musculoskeletal injury + complete brachial plexus avulsion

Physical Exam

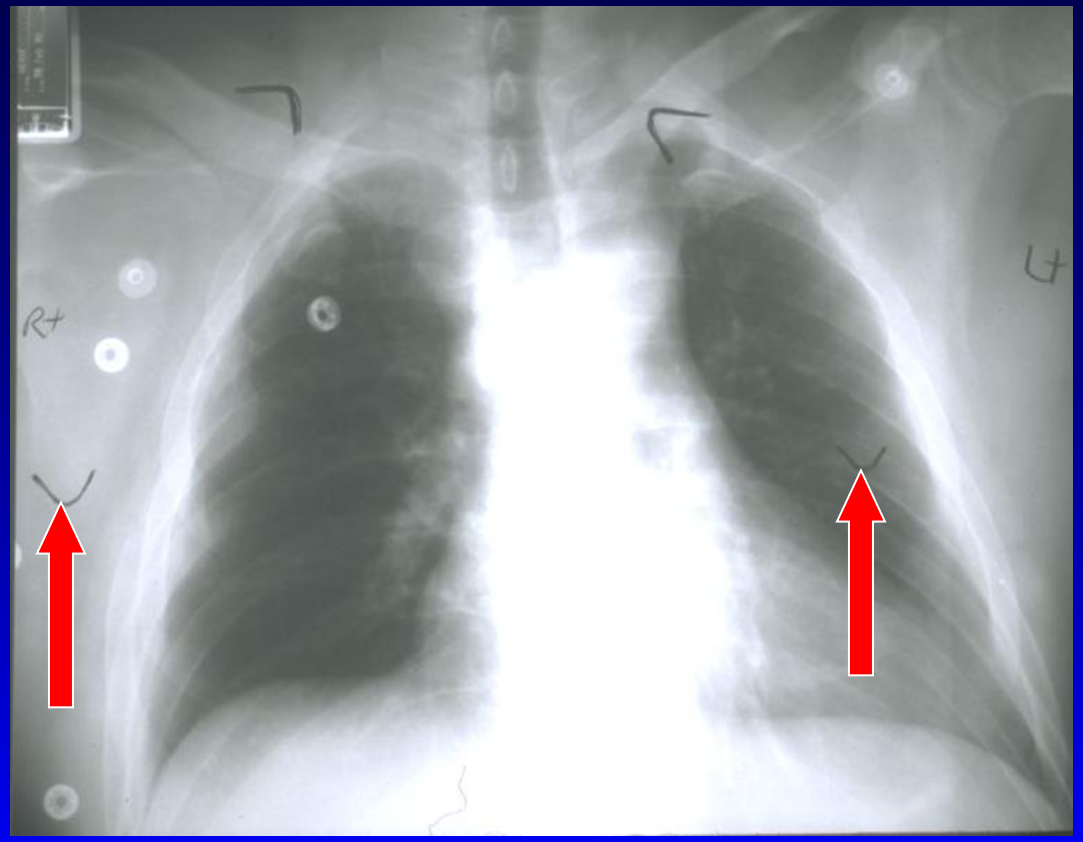
- ATLS protocol
- Inspection:
  - Asymmetric shoulder swelling, open fractures
- Palpate chest and shoulder
- Assess for other upper extremity fractures
- Check arterial injury
- Assess neurologic function

Arterial injury

- Pulselessness in common
  - 71/72 cases in one series (Lee 1998)
  - May be due to vasoconstriction, hypovolemic shock, other fractures
- Not all pulseless extremities have critical arterial injury needing revascularization
  - Sampson 1993: 11 pulseless, only 1 had limb threatening ischemia
- Limb threatening ischemia is present in 10%
  - Cold, mottled, blue discolouration
- Need vascular consultation and CT angio to confirm

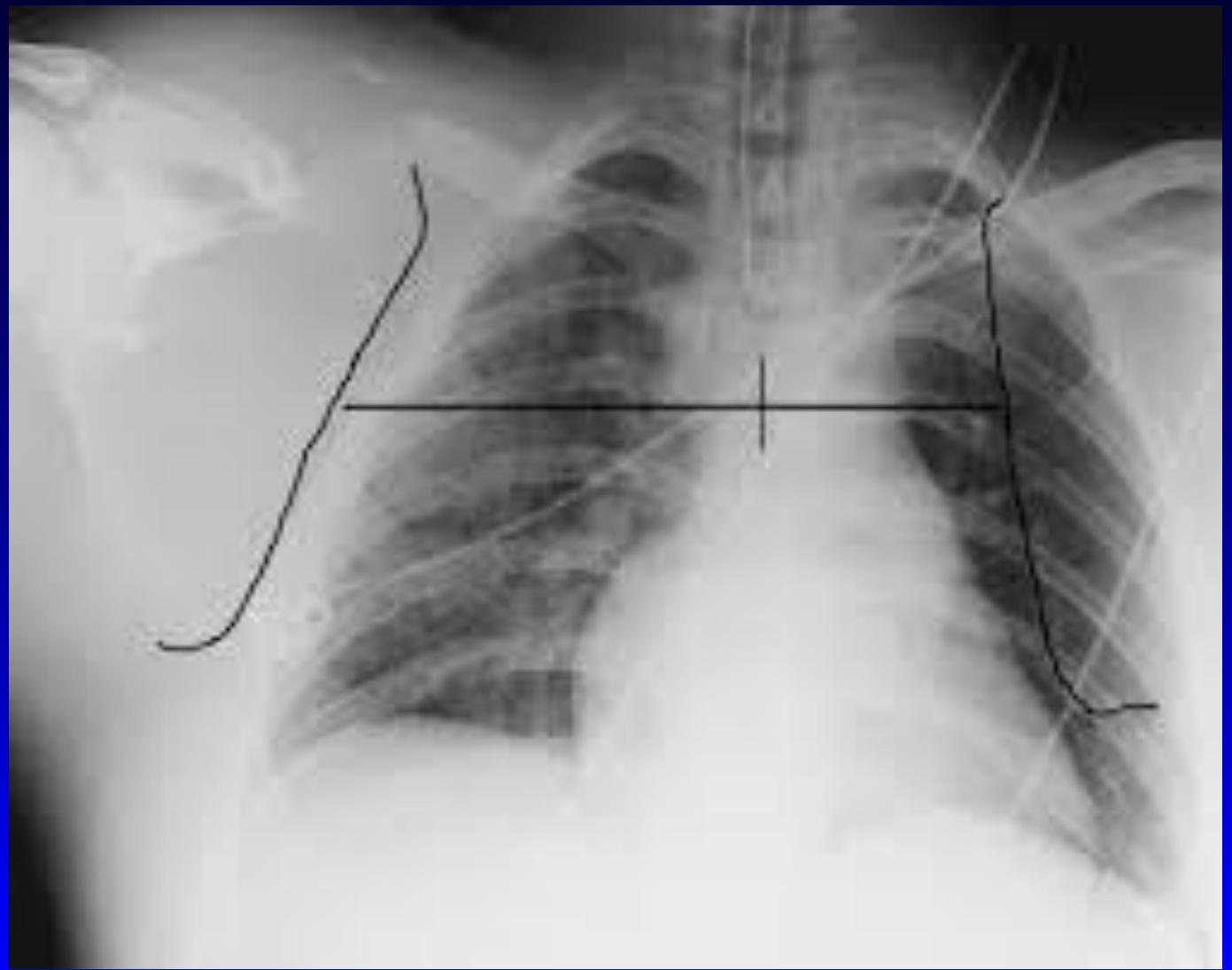
Radiographic Assessment

- Lateral displacement of scapula
- >1cm difference is concerning

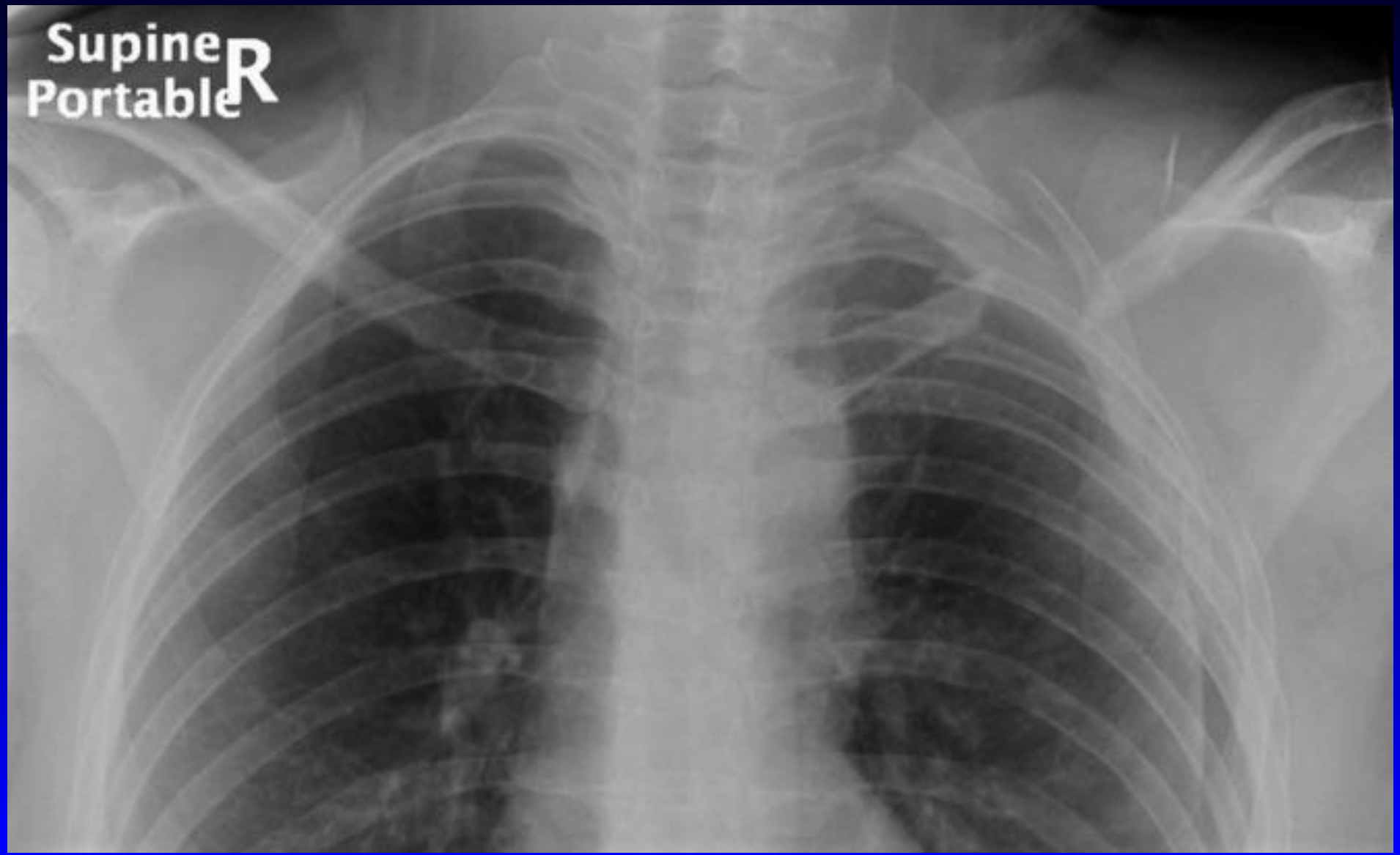


Scapular index

- Measure medial border of scapula to midline
- Compare injured to uninjured
- Ratio > 1.29 is scapulothoracic dissociation unless proven otherwise



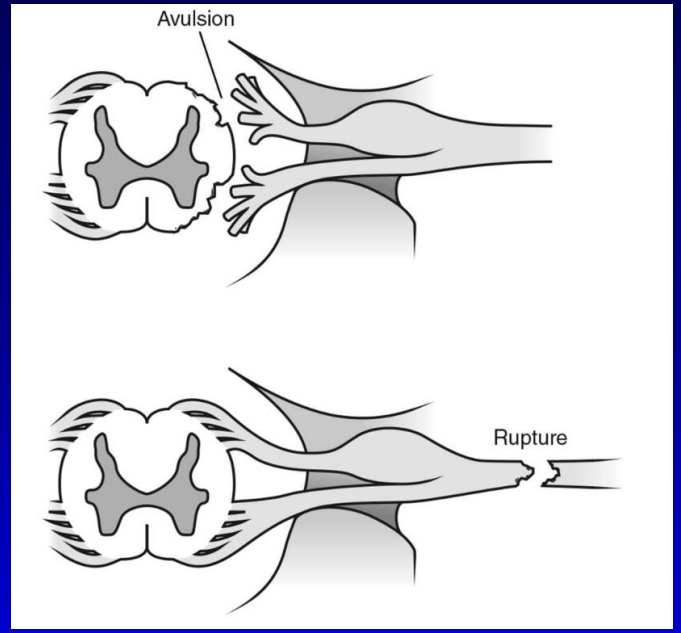
Clavicle fracture distraction



CT

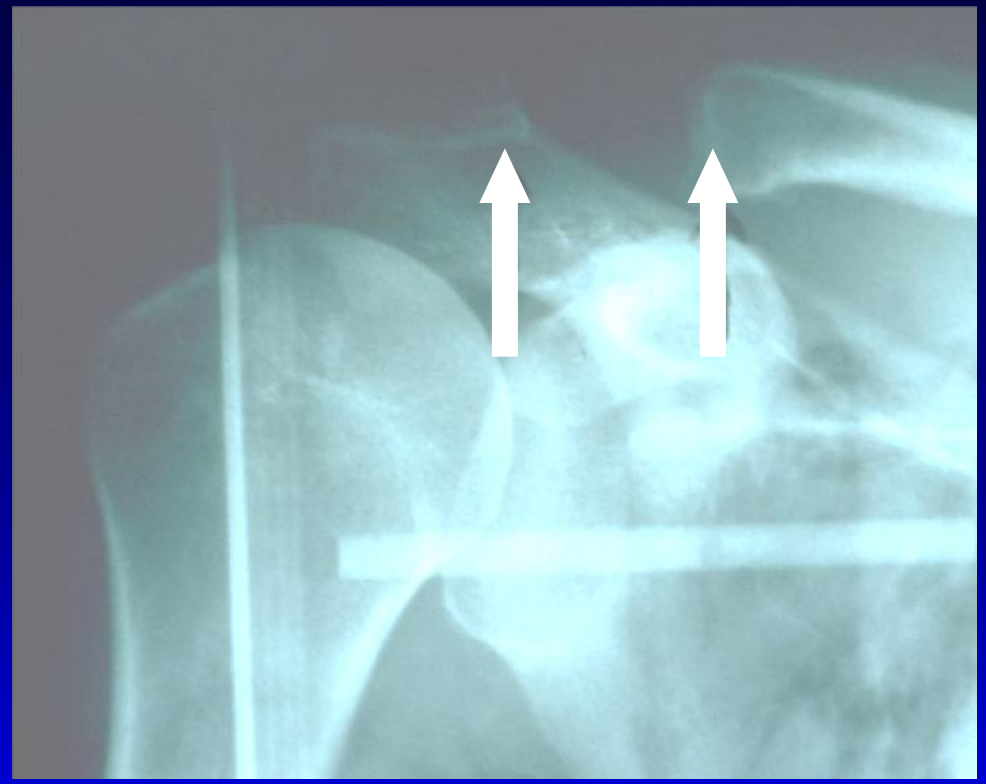
Other tests

- CT myelogram
  - Assess for pseudomeningocele (pre-ganglionic nerve injury)
  - After 3 weeks
- MRI
  - For pre and post ganglionic nerve injuries
- Electrodiagnositics
  - To assess for location and severity of nerve injury
  - Also to assess progression/recovery

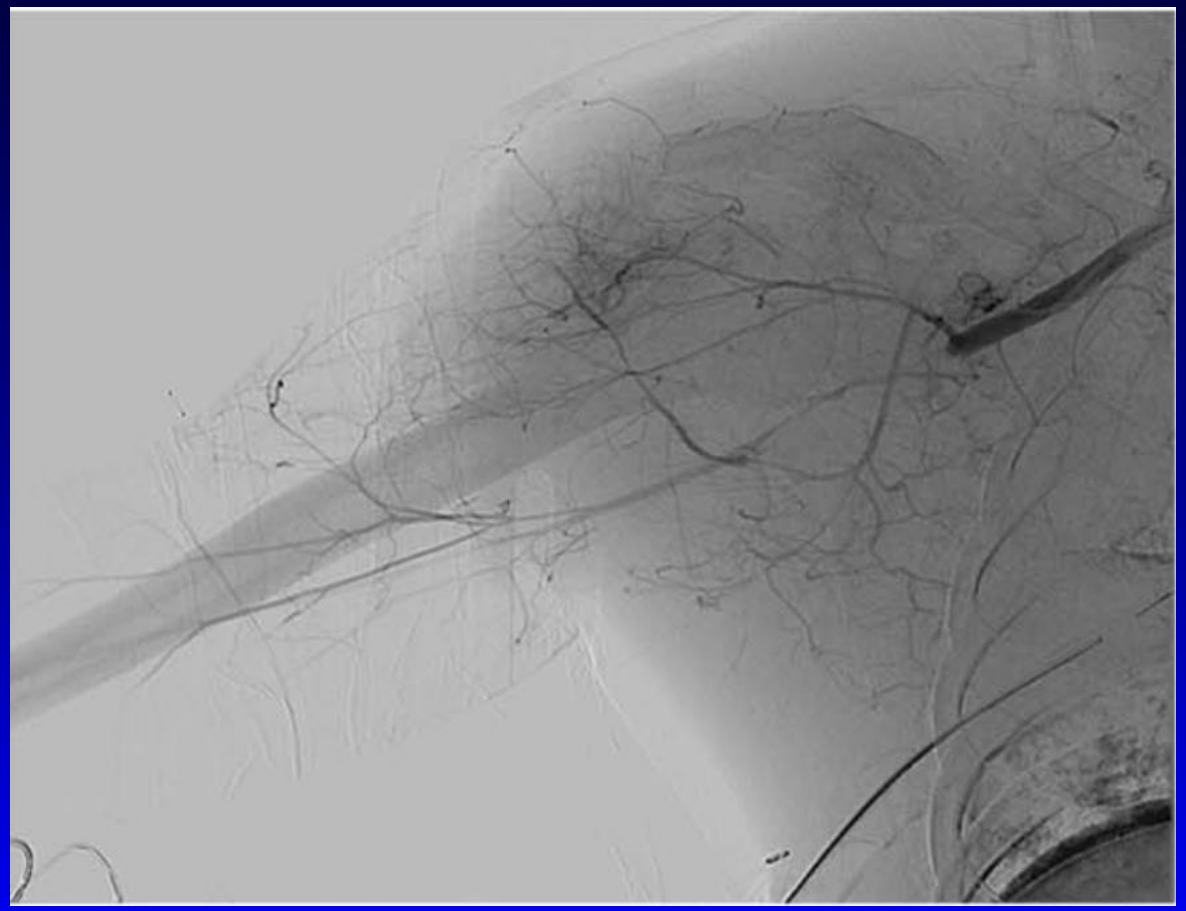


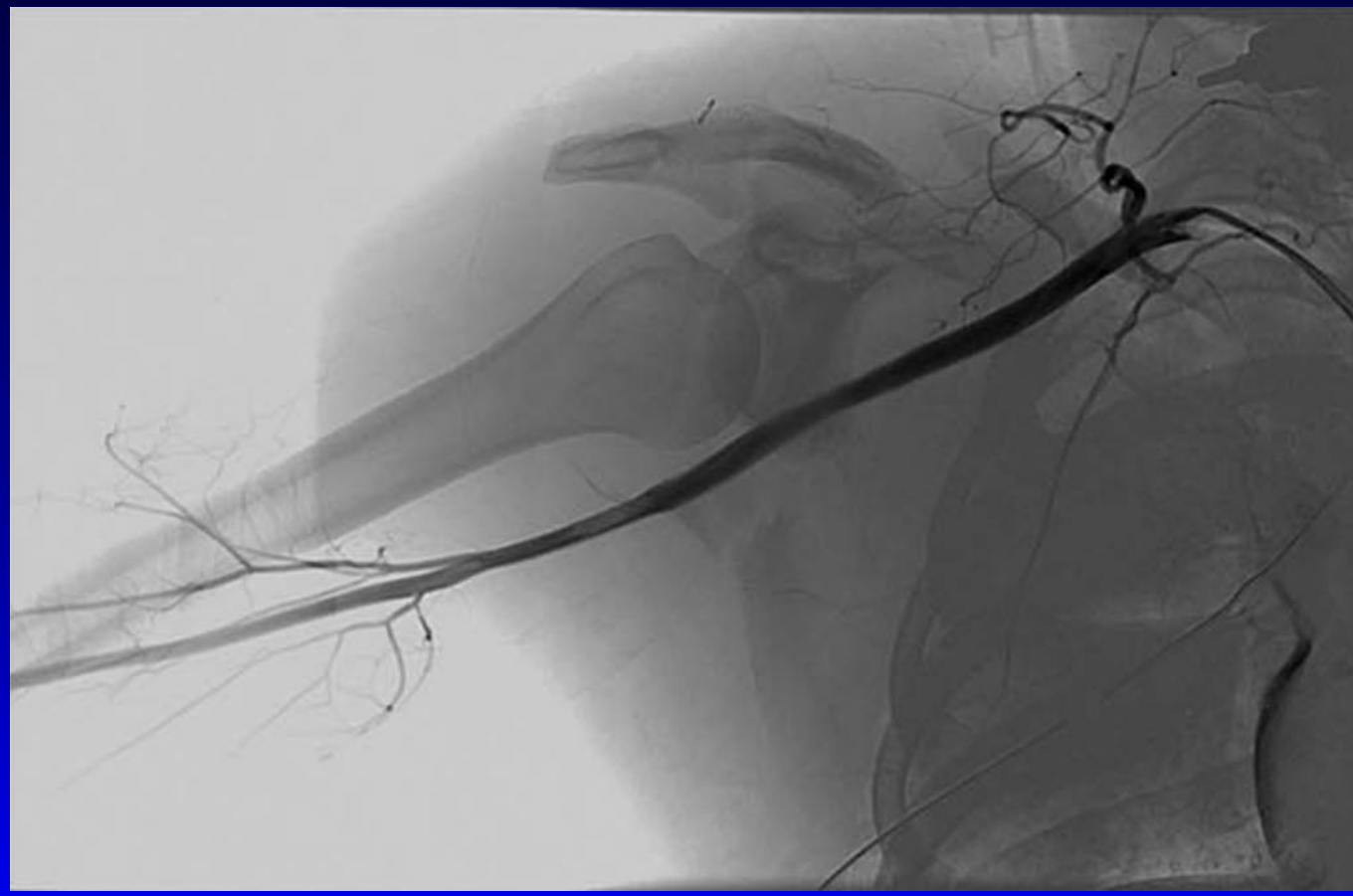
Treatment

- Life-threatening injuries first
- Stabilization of skeletal injury
- Vascular repair
- Neurologic exploration?



Vascular Repair



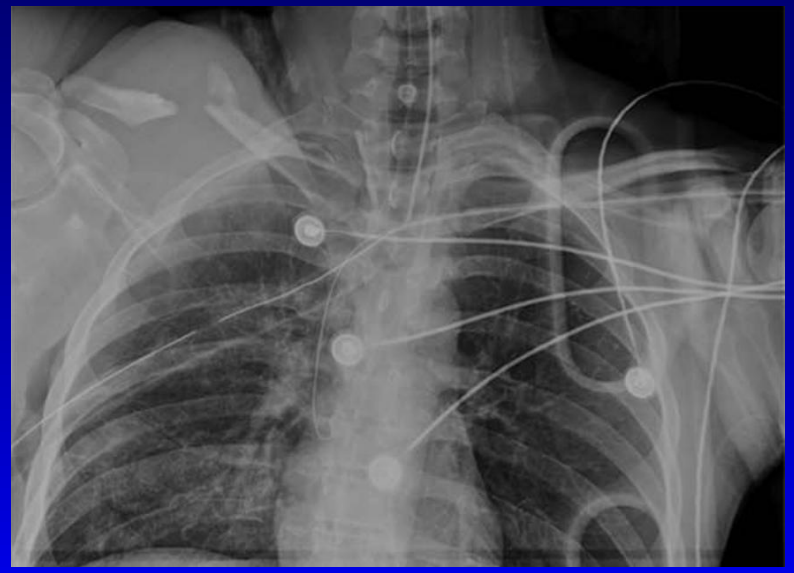


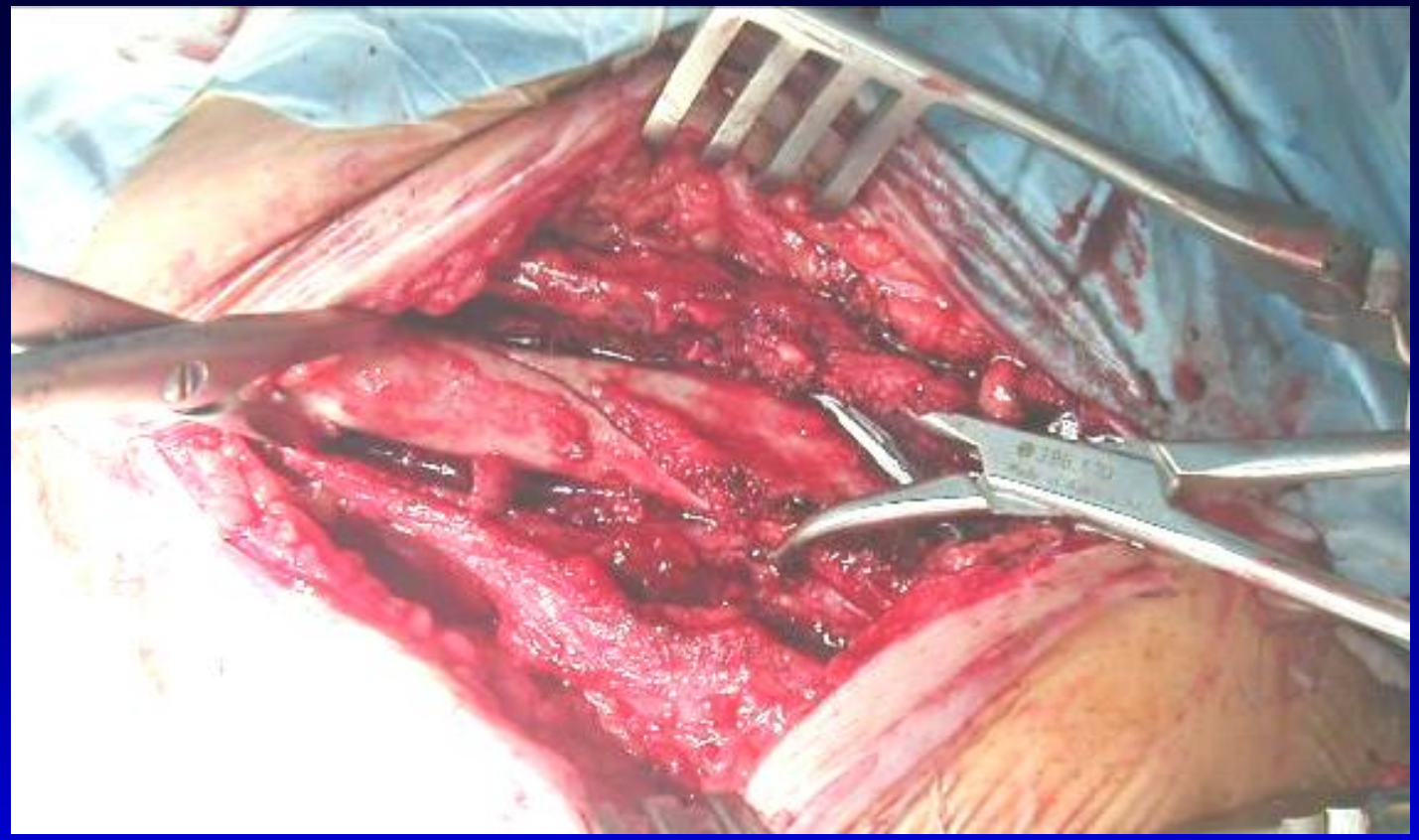
Osseous Fixation

- Fix clavicle fracture: ORIF
- Fix AC joint separation
  - Spanning plate across AC joint
- Fix SC joint separation
  - Autograft/allograft tendon repair
  - Plate fixation across SC

Methods of fixation

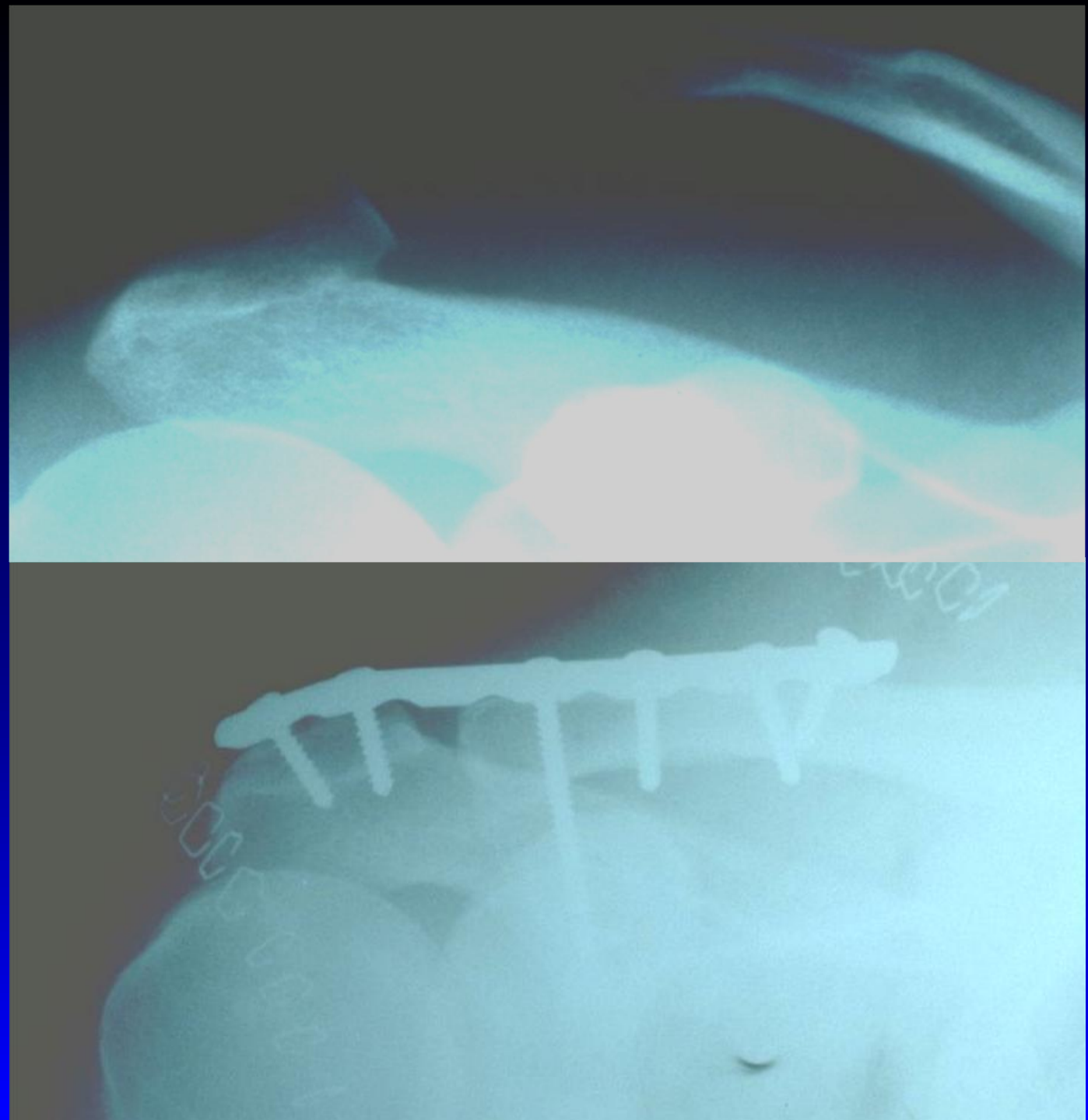
- Clavicle

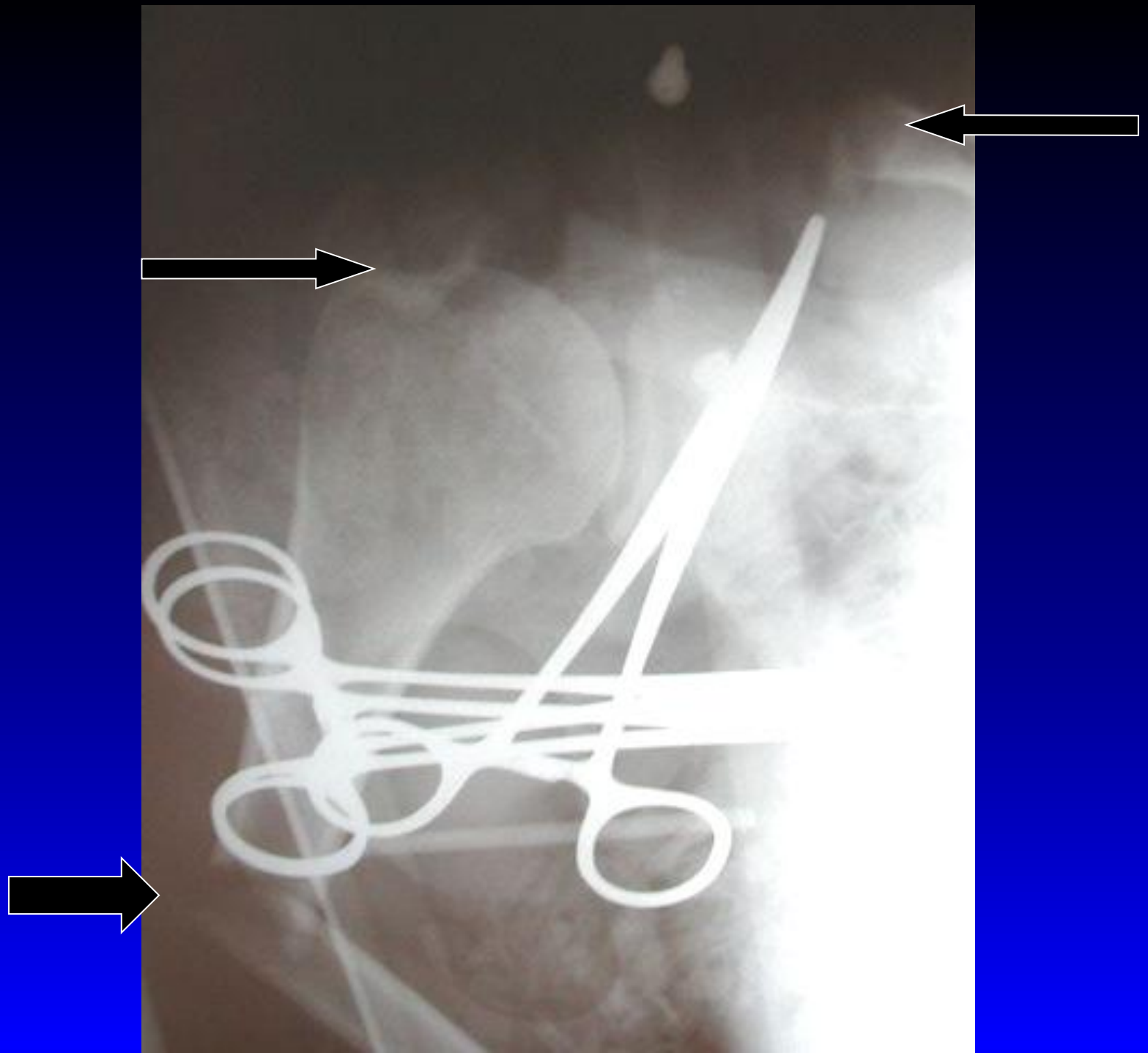


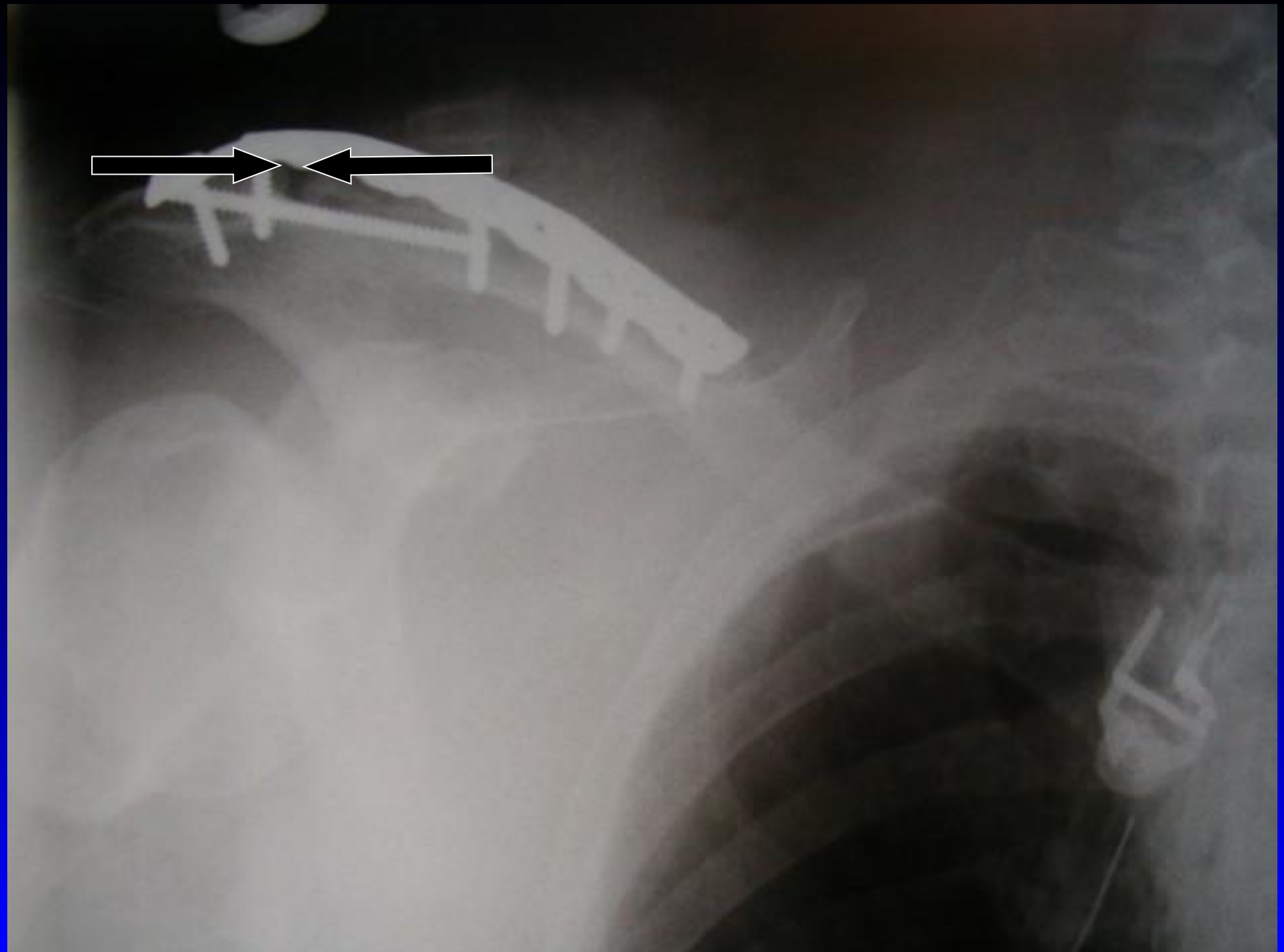


Methods of fixation

- Acromioclavicular joint

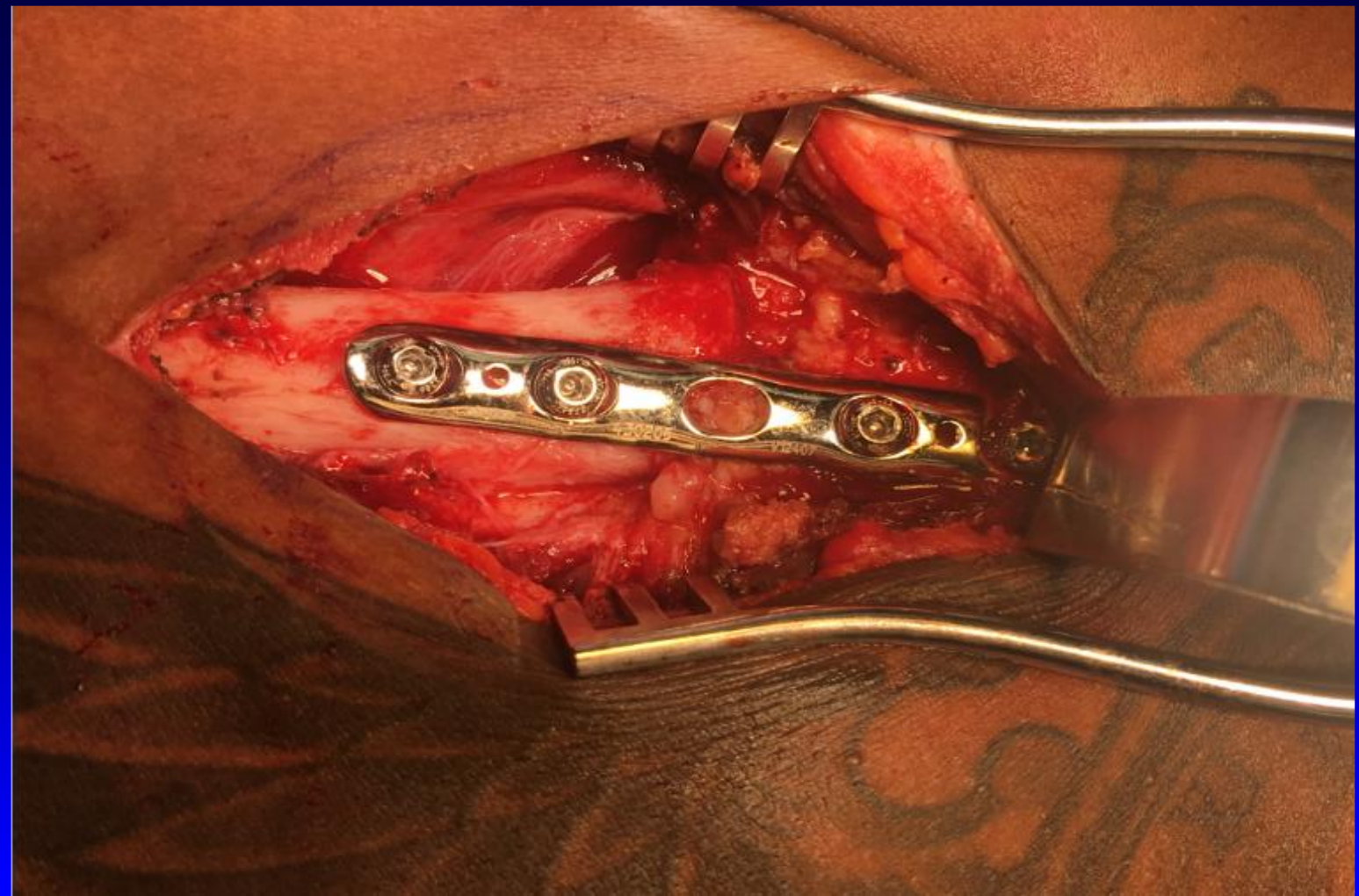






Methods of fixation

- Sternoclavicular joint



Management options for nerve injury

- Observation
- Neurolysis
- Nerve repair
- Nerve grafting, nerve transfer
- Tendon or muscle transfers
- Amputation

Neurological prognosis

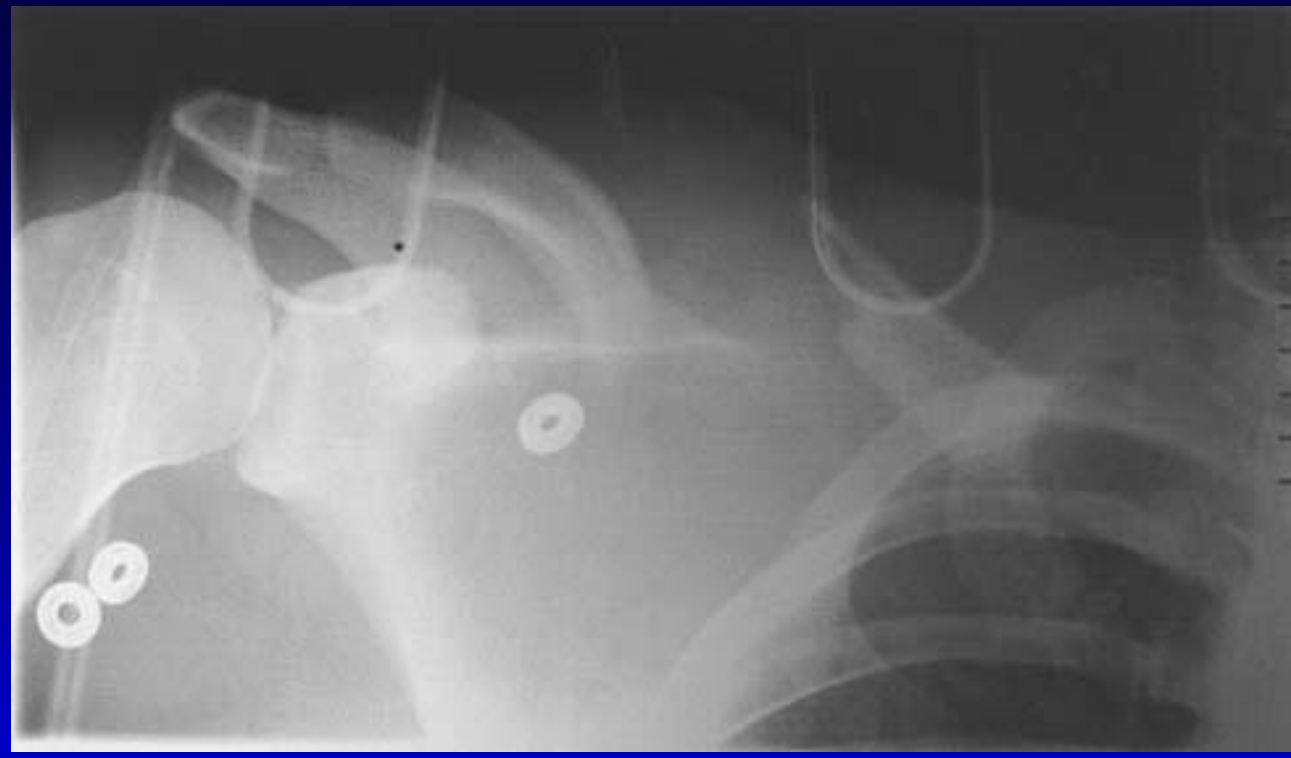
- Complete brachial plexus injury with no motor activity or sensation: 0% chance of meaningful recovery

Immediate amputation

- If the patient has:
  - vascular injury
  - complete brachial plexus injury
  - multiple U/E #’s

    OR

  - life threatening injury, with hemorrhage



Late deformity

Late deformity

Conclusions

- Devastating injury with high incidence of life-threatening injuries
- Skeletal stabilization (SC joint, clavicle, AC joint) is primary orthopaedic objective
- Vascular repair required in a significant number of patients
- Primary amputation is the treatment of choice for the dysvascular, flail limb
- Prognosis remains poor for neurological recovery