Disorders of the Medial
End of Clavicle

Muhammad Mansha

SpR Teaching - Shoulder Term 2010
Overview

- Surgical Anatomy of SCJ

- Traumatic injuries
  - Clinical Examination
  - Investigations
  - Management
  - Complications

- A-traumatic Disorders
Surgical Anatomy SCJ

- Diarthrodial joint-saddle type
- Least amount of bony stability
The articular surface of clavicle is much larger than the sternum.

In 2.5% of patients – small facet on inferior aspect which articulate with first rib (Cave, et al. 1958)
Ligaments are the main factors in stability and integrity of joint

- Costoclavicular Ligament
- Capsular Ligament
- Interclavicular Ligament
- Intra-articular Disk Ligament
Ligaments are the main factors in stability and integrity of joint.

Joint capsule

Costoclavicular ligament
Range of motion

- Freely mobile function almost like a ball and socket joint
- 30 - 35 degrees of upward elevation
- 35 degrees of combined forward and backward movement
- 45 - 50 degrees of rotation around its long axis
Applied surgical anatomy

- Important structures are just behind!!
- Sternohoid
- Sternothyroid
- Scaleni
Traumatic Injuries

- Aetiology
  - Sprain or subluxation
  - Acute Dislocation
  - Chronic Dislocation
Dislocation

- Anatomic
  - Anterior dislocation
  - Posterior dislocation
Dislocation

Sternoclavicular Joint Dislocation
Mechanism of injury

- Direct or indirect
- Least commonly dislocated joint
  - Incidence 3% of shoulder girdle injuries – cave et al 1958
- common causes
  - Vehicular accidents (80%)  
  - Sports (20 %) – omer et al. 1967
Clinical Exam

- Signs and symptoms of
  - A traumatic subluxation /dislocation
    - Usually anterior
    - Not much pain
    - Non operative treatment (Rockwood & Odor, JBJS 1989)
  - Traumatic Subluxation
    - Ligaments are intact
    - Mild to moderate pain
    - Swelling and tenderness
    - No instability
Dislocation

Anterior dislocation

- Severe pain
- Shortened & thrust forward
- Head tilted to side
- Pain increases on lying supine
- Lateral stress test
- Prominent medial end
Posterior dislocation

- More pain
- Less prominent
- Medial end displaced posterior
- Corner of sternum palpable
- ? Signs of pressure
- ? Signs of pneumothorax
“one can not always rely on the clinical findings and imaging is mandatory if there is suspicion”
Imaging

- Radiographs
  - AP view
  - Heining view
  - Hobbs view
  - Serendipity view
- CT scans
- MRI
- Ultrasound
Treatment traumatic injuries

- Anterior dislocation
  - Non Operative /Operative
    - Good results in 70% of patients at 5 year managed non operatively- de Jong & Sukul J Orthop Trauma 1988
    - Equally good results with operative and non operative treatment-Fery & sommelet, Int Orthp 1998
  - Method of closed reduction
  - Post reduction care
    - 4-6 week figure-of-eight dressing
  - Operative
    - Not generally recommended
Traumatic posterior dislocation

- As a general rule
  - Careful examination
  - CT Scan
  - Closed reduction +/- open reduction

- Methods of closed reduction
  - Abduction traction technique
  - Adduction traction technique

- Post reduction care
  - Figure-of-eight dressing / straps 4-6 weeks
Operative treatment

- Open reduction

- Stabilisation of SCJ
  - Several basic procedures have been advocated e.g. fascia lata, suture, internal fixation across the joint, subclavius tendon and osteotomy of clavicle

- Resection medial 2-3 cm and stabilisation of remaining clavicle to first rib
Complications

- Complication of injuries to SCJ
  - Pneumothorax
  - venous congestion,
  - rupture of oesophagus,
  - neurovascular compression / injury
  - tracheal injuries

- Complications of operative procedures
Atraumatic Disorders

- **Degenerative**
  - Osteoarthritis
  - Arthropathies
  - Condensing osteitis of the medial clavicle
  - Sternocostoclavicular hyperostosis
  - Postmenopausal arthritis

- **Infection**
  - Chronic Sclerosing Osteomyelitis of the clavicle

- **Malignancy**
Sclerosis of the medial end of clavicle

- **Infection**
  - CRMO
  - SCJ pyogenic arthritis
  - SCJ non-pyogenic arthritis (TB, Brucella)

- **Neoplastic**
  - Ewings
  - Osteosarcoma
  - Osteoid osteoma, Osteoblastoma
  - Metastatic
  - Lymphoma

- **Dysplasia**
  - Fibrous dysplasia
  - Bone Island

- **Metabolic**
  - Pagets

- **Trauma**
  - Healed Fracture
  - Stress fracture

- **Miscellaneous**
  - Condensing osteitis
  - Friedich’s Disease
  - Sternoclavicular hyperostosis
  - Congenital Pseudoarthrosis
Chronic Sclerosing Osteomyelitis of the clavicle

- Non-pyogenic
- Unknown aetiology, Infection?
- Children & Adolescents
- F>M
- insidious in onset, Pain & Swelling
- affects the medial portion of clavicle
- Sub acute relapses and symptom-free remissions.
Chronic Sclerosing Osteomyelitis of the clavicle

- High ESR, normal WCC
- Typically negative cultures
- Histology: bone resorption, inflammation, plasma cells, fibrosis and bone deposition.
- Long term antibiotics no therapeutic benefit.
CHRONIC RECURRENT MULTIFOCAL OSTEOMYELITIS

X-rays:
Early: multiple osteolytic foci
CHRONIC RECURRENT MULTIFOCAL OSTEOMYELITIS

Late: sclerosis and enlargement.
Chronic Sclerosing Osteomyelitis of the clavicle

- Rarely occurs in isolation
- Other foci may be subclinical (Bone Scan)
- **Chronic Recurrent Multifocal Osteomyelitis (CRMO)**
- Confusing terminology, (Garre’s sclerosing osteomyelitis, cleido-metaphyseal osteomyelitis may well represent different manifestations of the same disease process.)
CRMO

- 20-40% cases have Skin manifestation of Pustulosis (palmaris et plantaris) or Acne
- SAPHO SYNDROME
- Synovitis
- Acne
- Pustulosis
- Hyperostosis
- Osteitis
Occasional growth of organisms,
Propionibacterium spp… contaminants?
<table>
<thead>
<tr>
<th>Presenting symptoms</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone pain</td>
<td>100</td>
</tr>
<tr>
<td>Fever</td>
<td>33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of lesions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multifocal distribution</td>
<td>93</td>
</tr>
<tr>
<td>Symmetric distribution</td>
<td>24</td>
</tr>
<tr>
<td>More than 1 lesion per bone</td>
<td>7</td>
</tr>
<tr>
<td>Metaphyses of tubular bones</td>
<td>49</td>
</tr>
<tr>
<td>Cancellous bone</td>
<td>25</td>
</tr>
<tr>
<td>Epiphyses</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extraosseous manifestation</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pustulosis of the skin</td>
<td>20</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
</tbody>
</table>

* The number of eligible patients is indicated under Subjects and Methods.
<table>
<thead>
<tr>
<th>Site of Bone Lesions</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tibia</td>
<td>203</td>
<td>25.5</td>
</tr>
<tr>
<td>Femur</td>
<td>93</td>
<td>11.7</td>
</tr>
<tr>
<td>Clavicle</td>
<td>74</td>
<td>9.2</td>
</tr>
<tr>
<td>Foot</td>
<td>69</td>
<td>8.6</td>
</tr>
<tr>
<td>Vertebral bodies</td>
<td>61</td>
<td>7.7</td>
</tr>
<tr>
<td>Fibula</td>
<td>42</td>
<td>5.2</td>
</tr>
<tr>
<td>Humerus</td>
<td>30</td>
<td>3.7</td>
</tr>
<tr>
<td>Radius</td>
<td>30</td>
<td>3.7</td>
</tr>
<tr>
<td>Pelvis</td>
<td>27</td>
<td>3.4</td>
</tr>
<tr>
<td>Rib</td>
<td>23</td>
<td>2.9</td>
</tr>
<tr>
<td>Sacroiliac joint</td>
<td>23</td>
<td>2.9</td>
</tr>
<tr>
<td>Ulna</td>
<td>18</td>
<td>2.3</td>
</tr>
<tr>
<td>Finger</td>
<td>11</td>
<td>1.4</td>
</tr>
<tr>
<td>Sternum</td>
<td>10</td>
<td>1.3</td>
</tr>
<tr>
<td>Scapula</td>
<td>7</td>
<td>0.9</td>
</tr>
<tr>
<td>Hand</td>
<td>6</td>
<td>0.8</td>
</tr>
<tr>
<td>Mandibula</td>
<td>6</td>
<td>0.8</td>
</tr>
<tr>
<td>Skull</td>
<td>3</td>
<td>0.4</td>
</tr>
<tr>
<td>Toe</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>Maxilla</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Patella</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Not indicated</td>
<td>57</td>
<td>7.2</td>
</tr>
<tr>
<td>Total</td>
<td>797</td>
<td></td>
</tr>
</tbody>
</table>
- 75% did not respond to antibiotics
- 79% had good response to NSAIDS
- Other successful agents:
  - Corticosteroids
  - Bisphosphonates
  - Interferon alpha & gamma
CRMO: long term follow up
12 patients, 14 year follow-up

Duffy et al JPO 2002; 22(4); 501-505
Condensing Osteitis of the Clavicle

- Browner, 1974
- Women, age 20-50
- Pain and swelling
- Insidious onset
- Unknown aetiology, repetitive stress?
- Sclerosis and enlargement of infero-medial end of clavicle
CONDENSING OSTEITIS

Unilateral, no involvement of SCJ
Condensing Osteitis

- XRAY, CT
- Biopsy
- Thick trabeculae and cortex.

- Usually mild symptoms, treat symptomatically.
- May resolve
- NSAIDS
- Surgical excision.
Friedich’s disease

- Friedich, 1924
- Avascular Necrosis of Medial end of Clavicle
- Rare, 28 cases reported
- Usually female (age 6-58)
- Pain and swelling
FRIEDICH'S DISEASE

XRAY:
- Irregular SCJ
- destruction of medial end of clavicle
Friedich’s disease

- CT/MRI
- Bone Scan (hot)

- Most improve with time (up to 8 years)
- If loss of movement consider resection.
Sternocostoclavicular Hyperostosis

- Part of SAPHO syndrome
- Age 40-60
- Variable disease
Ossification of ligaments
Ankylosis
Sternocostoclavicular Hyperostosis

- High ESR
- -ve HLA-B27
- Biopsy: non-specific inflammation, osteoid, thick trabeculae

- Treat with NSAIDS
- If painful ankylosis consider excision
- Steroids and radiation: limited use
Pyogenic arthritis SCJ

- Very rare
- IV drug abusers
- High incidence of HIV
- Surgical drainage

- Destruction of both articular surfaces
Neoplasms

- Metastatic, Lymphoma, Myeloma
- Primary lesions overall rare
- Most tumours present <1% in the clavicle
- 2-4%: Haemangiopericytoma, ABC, Ewing’s sarcoma, Desmoid tumours
History & Examination

- Age
- Gender
- Onset
- Other bones & joints
- Skin conditions
- Trauma & Repetitive stress
Investigations

- ESR, CRP, FBC
- Biochemistry
- (Rheumatoid factor, HLA-B27)
- Plain Xrays
- Bone Scan
- CT/MRI
- Biopsy
• Exclude malignancy and infection
• Exclude rare primary tumours
• Other conditions may be treated symptomatically in majority of cases.
Thanks!