Disorders of the Medial End of Clavicle

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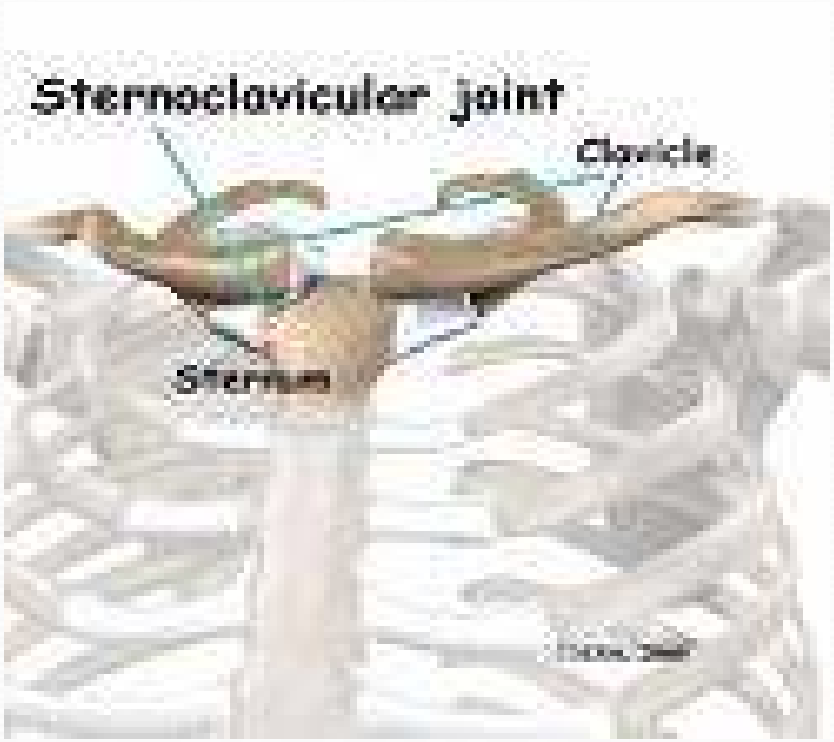
SpR Teaching- Shoulder Term 2010

Overview

- Surgical Anatomy of SCJ
- Traumatic injuries
  - Clinical Examination
  - Investigations
  - Management
  - Complications
- A-traumatic Disorders

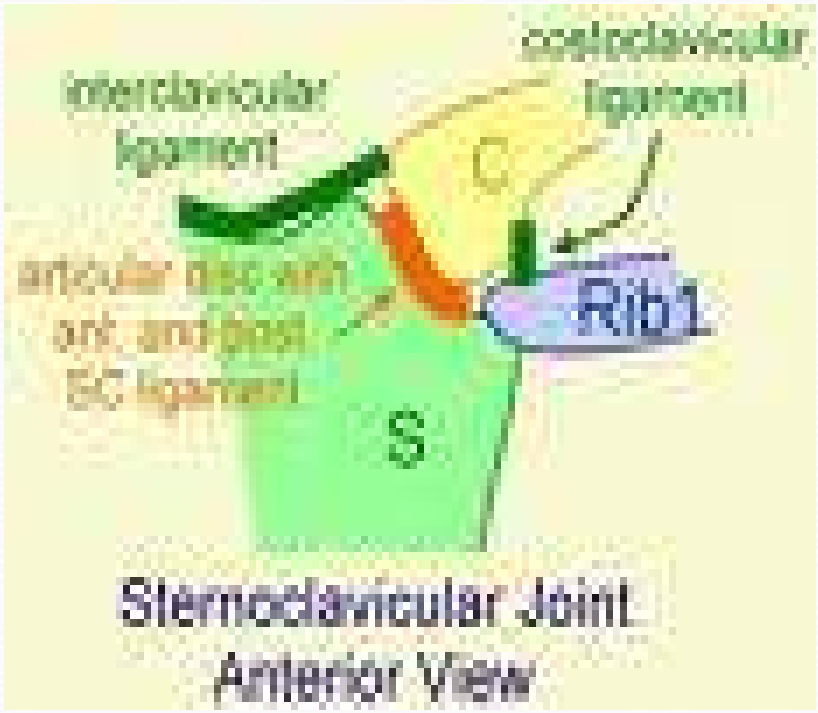
Surgical Anatomy SCJ

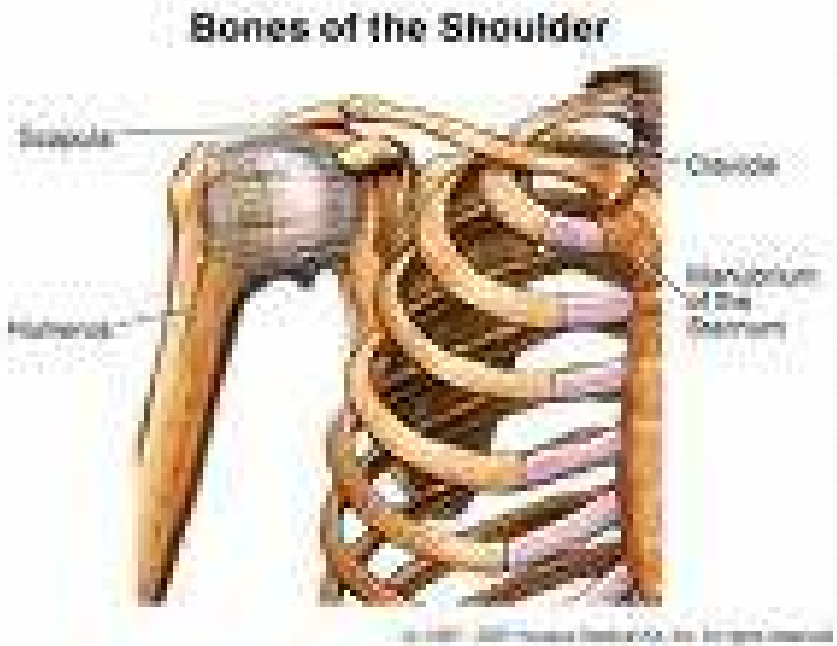
- Diarthrodial joint-saddle type
- Least amount of bony stability



The articular surface of clavicle is much larger than the sternum

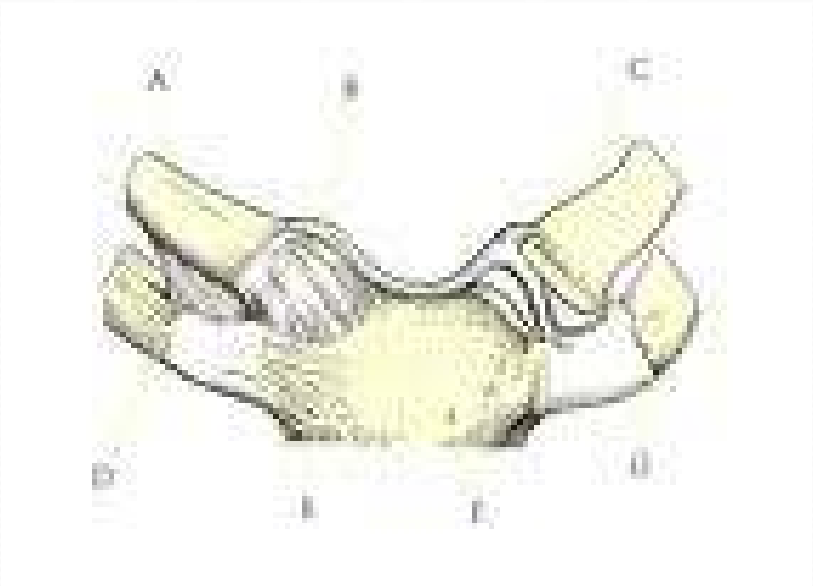
In 2.5% of patients – small facet on inferior aspect which articulate with first rib (Cave, et al. 1958

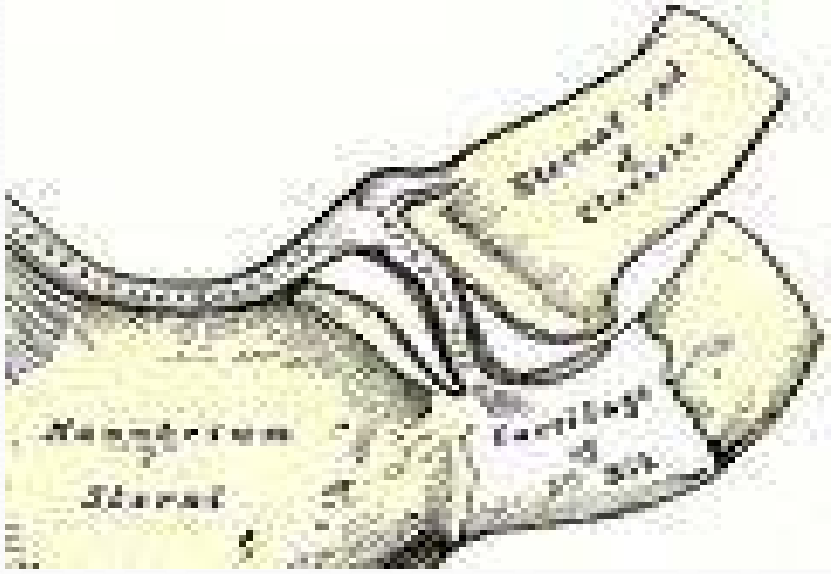




Ligaments are the main factors in stability and integrity of joint

- Costoclavicular Ligament
- Capsular Ligament
- Interclavicular Ligament
- Intra-articular Disk Ligament

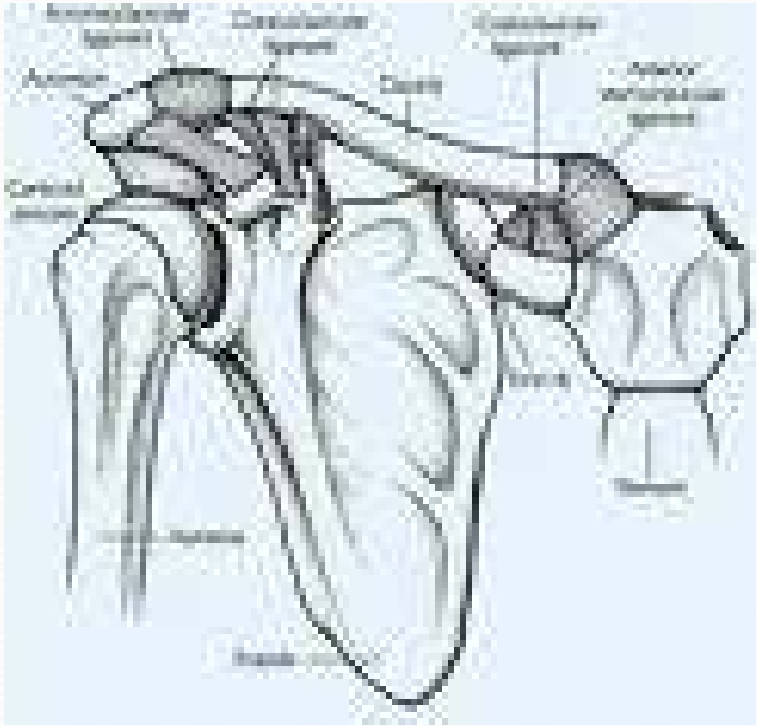




Ligaments are the main factors in stability and integrity of joint

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!!

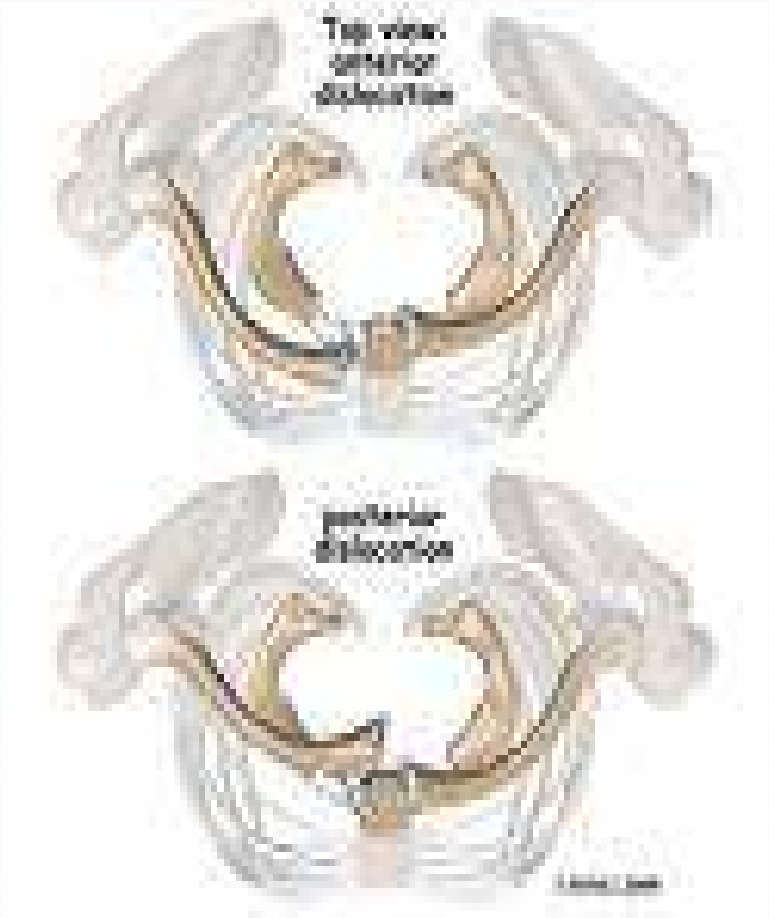
- Sternohoid
- Sternothyroid
- Scaleni

Traumatic Injurie

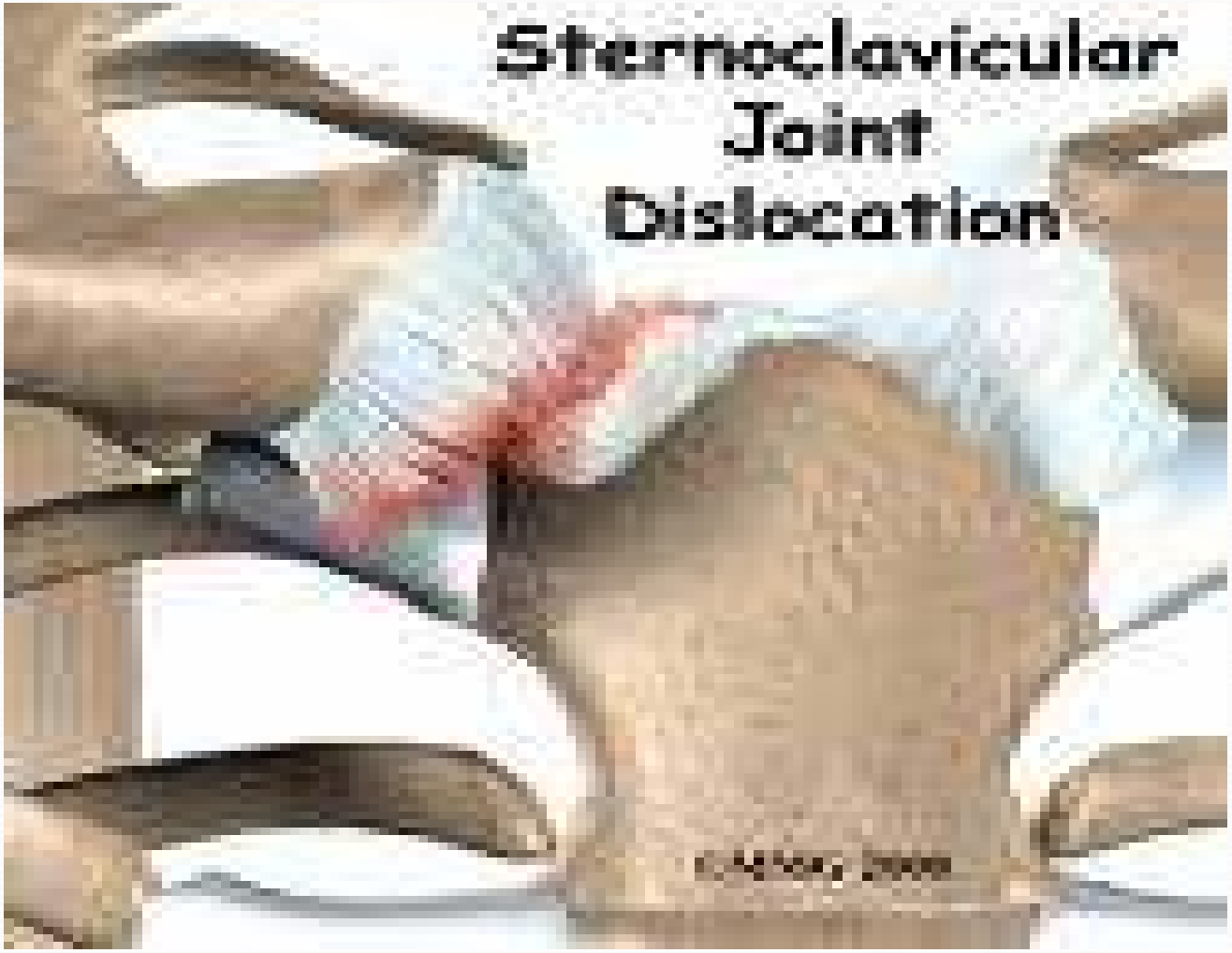
- Aetiology
  - Sprain or subluxation
  - Acute Dislocation
  - Chronic Dislocation

Dislocation

- Anatomic
  - Anterior dislocation
  - Posterior dislocation



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

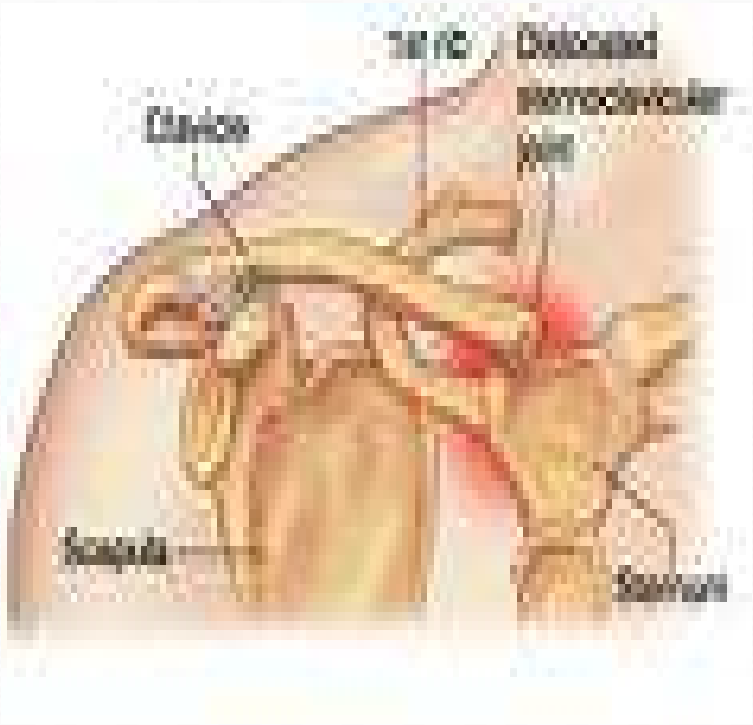
Dislocation

Anterior dislocation

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

Posterior dislocation

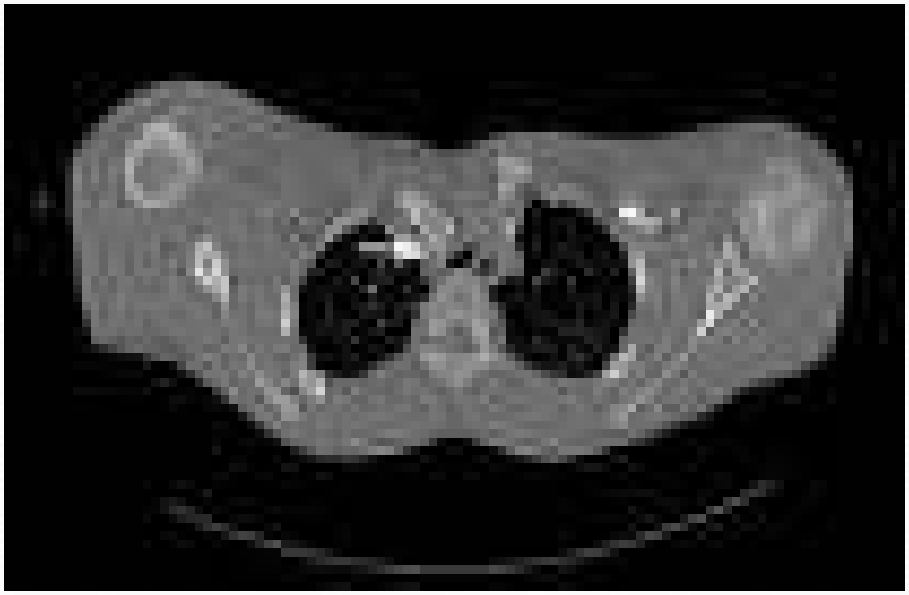
- More pain
- Less prominent
- Medial end displaced posterior
- Corner of sternum palpable
- ? Signs of pressure
- ? Signs of pneumothorx



“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 procedure has been advocated e.g. fascia lata, suture, internal fixation across the joint, subclavious 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

- Degerative
  - 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

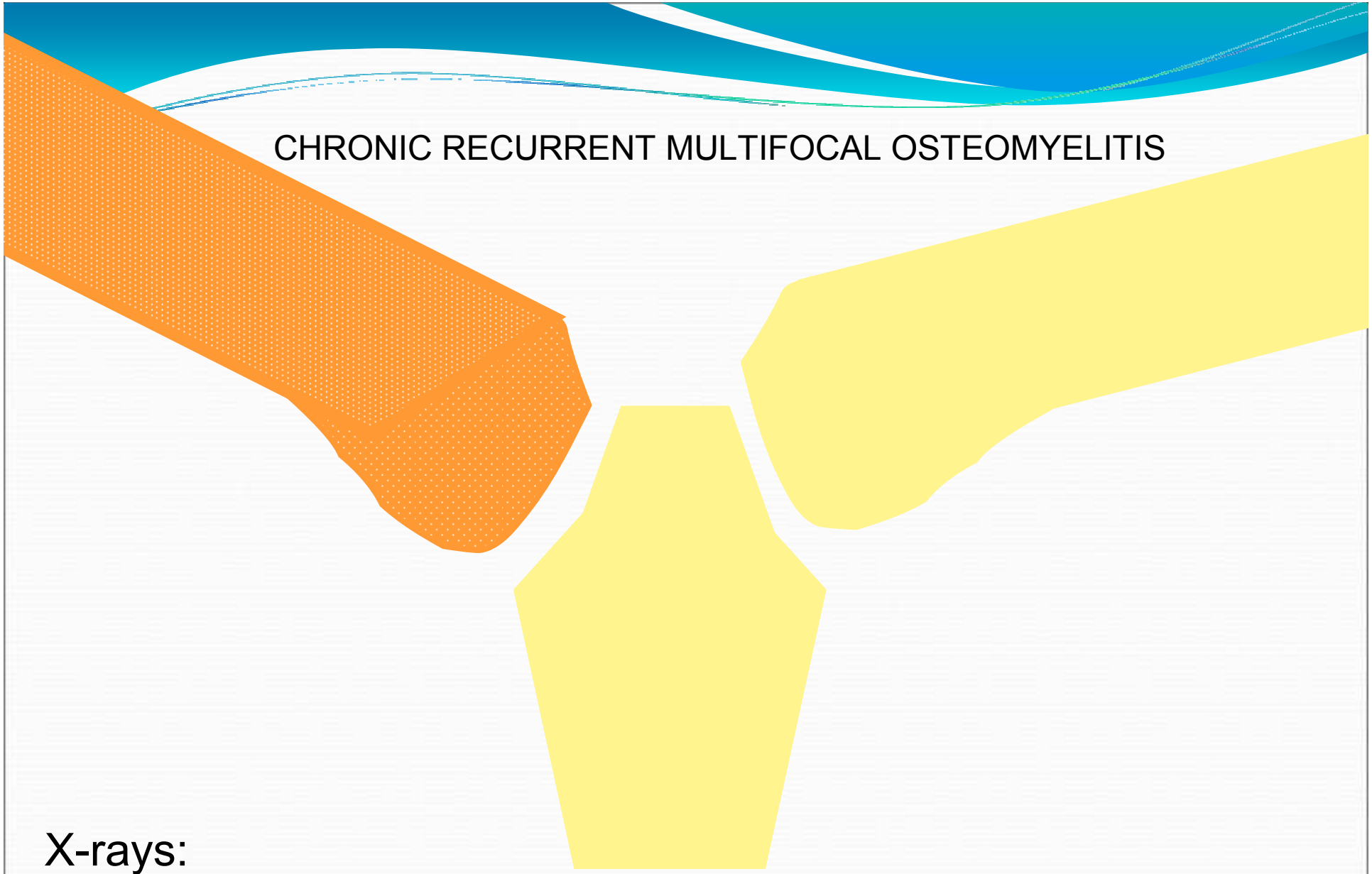
Chronic Sclerosing Osteomyelitis of the clavicle

- 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.

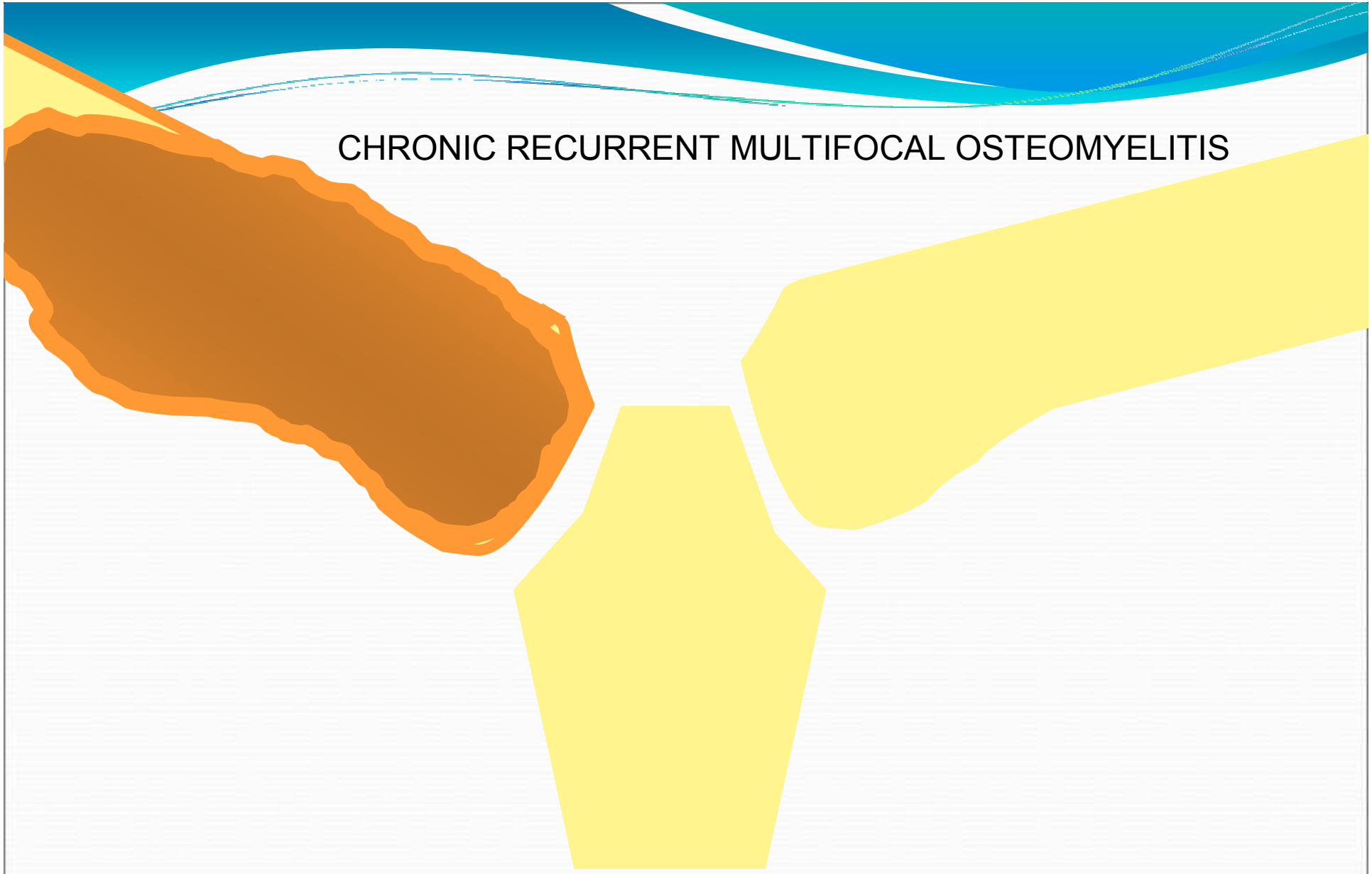
CHRONIC RECURRENT MULTIFOCAL OSTEOMYELITIS



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

CRMO Meta-annalysis 190 cases

	Median	Interquartile Range	Range
Age at onset of symptoms (yr)	10	7.3–12	0.75–19
No. of lesions	3	2–6	1–18
ESR (mm/h)	45	32–60	4–130
Overall duration of symptoms (yr)	2	1–4	0.5–20
Follow-up time (yr)	3.5	2–6.8	0.5–21

ESR, erythrocyte sedimentation rate.

Occasional growth of organisms,
Propionibacterium spp….contaminants?

Schultz et al JPO Volume 1999 ; 18(11) 1008-1013

	%
Presenting symptoms	
Bone pain	100
Fever	33
Location of lesions	
Multifocal distribution	93
Symmetric distribution	24
More than 1 lesion per bone	7
Metaphyses of tubular bones	49
Cancellous bone	25
Epiphyses	3
Extraosseous manifestation	
Pustulosis of the skin	20
Psoriasis	3
Other	5

* The number of eligible patients is indicated under Subjects and Methods.

Schultz et al JPO Volume 1999 ; 18(11) 1008-1013

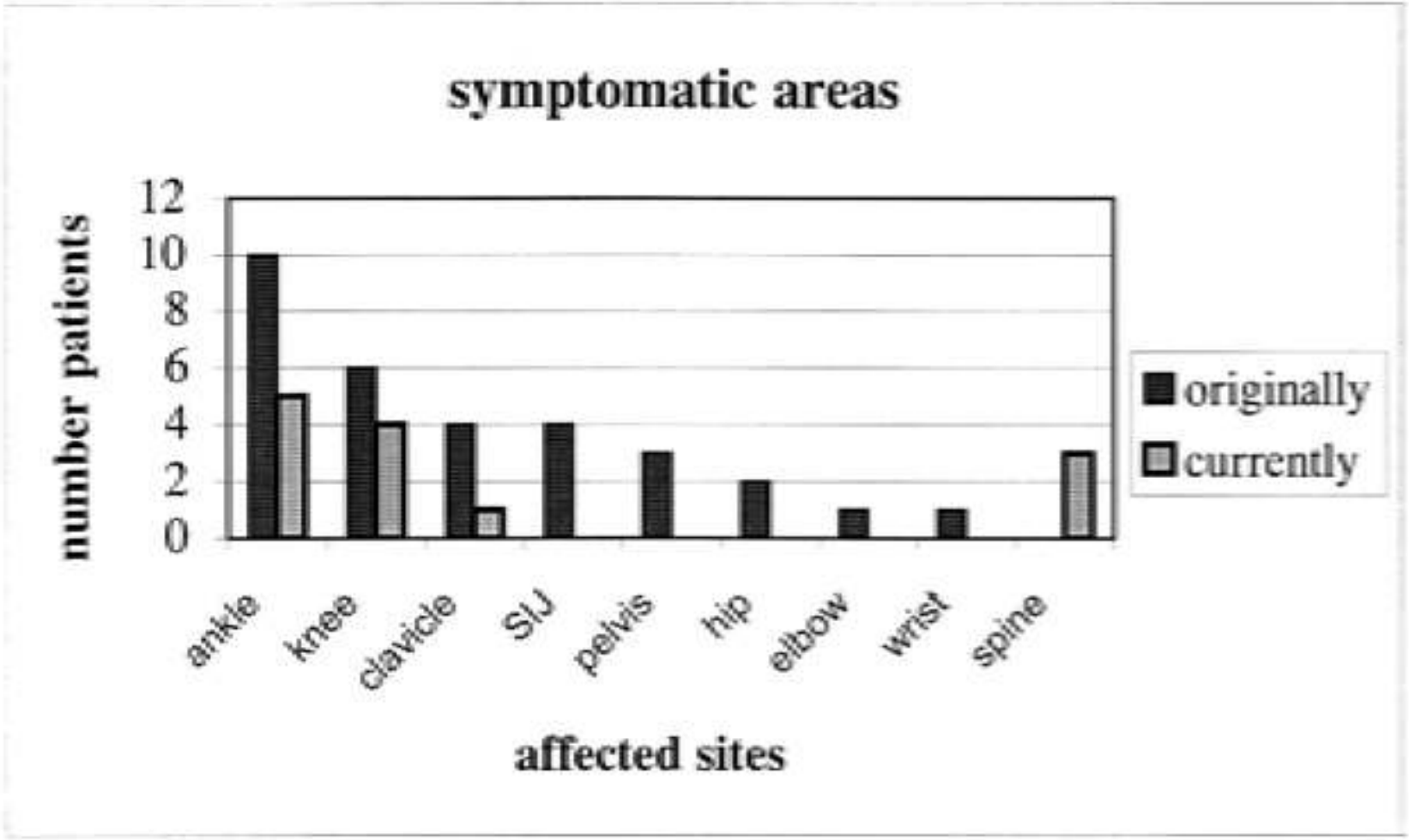
Site of Bone Lesions	No.	%
Tibia	203	25.5
Femur	93	11.7
Clavicle	74	9.2
Foot	69	8.6
Vertebral bodies	61	7.7
Fibula	42	5.2
Humerus	30	3.7
Radius	30	3.7
Pelvis	27	3.4
Rib	23	2.9
Sacroiliac joint	23	2.9
Ulna	18	2.3
Finger	11	1.4
Sternum	10	1.3
Scapula	7	0.9
Hand	6	0.8
Mandibula	6	0.8
Skull	3	0.4
Toe	2	0.3
Maxilla	1	0.1
Patella	1	0.1
Not indicated	57	7.2
Total	797	

Schultz et al JPO Volume 1999 ; 18(11) 1008-1013

- 75% did not respond to antibiotics
- 79% had good response to NSAIDS
- Other succesful agents:
  - Corticosteroids
  - Bisphosphonates
  - Interferon alpha & gamma

Schultz et al JPO Volume 1999 ; 18(11) 1008-1013

CRMO: long term follow up
12 patients, 14 year follow-up

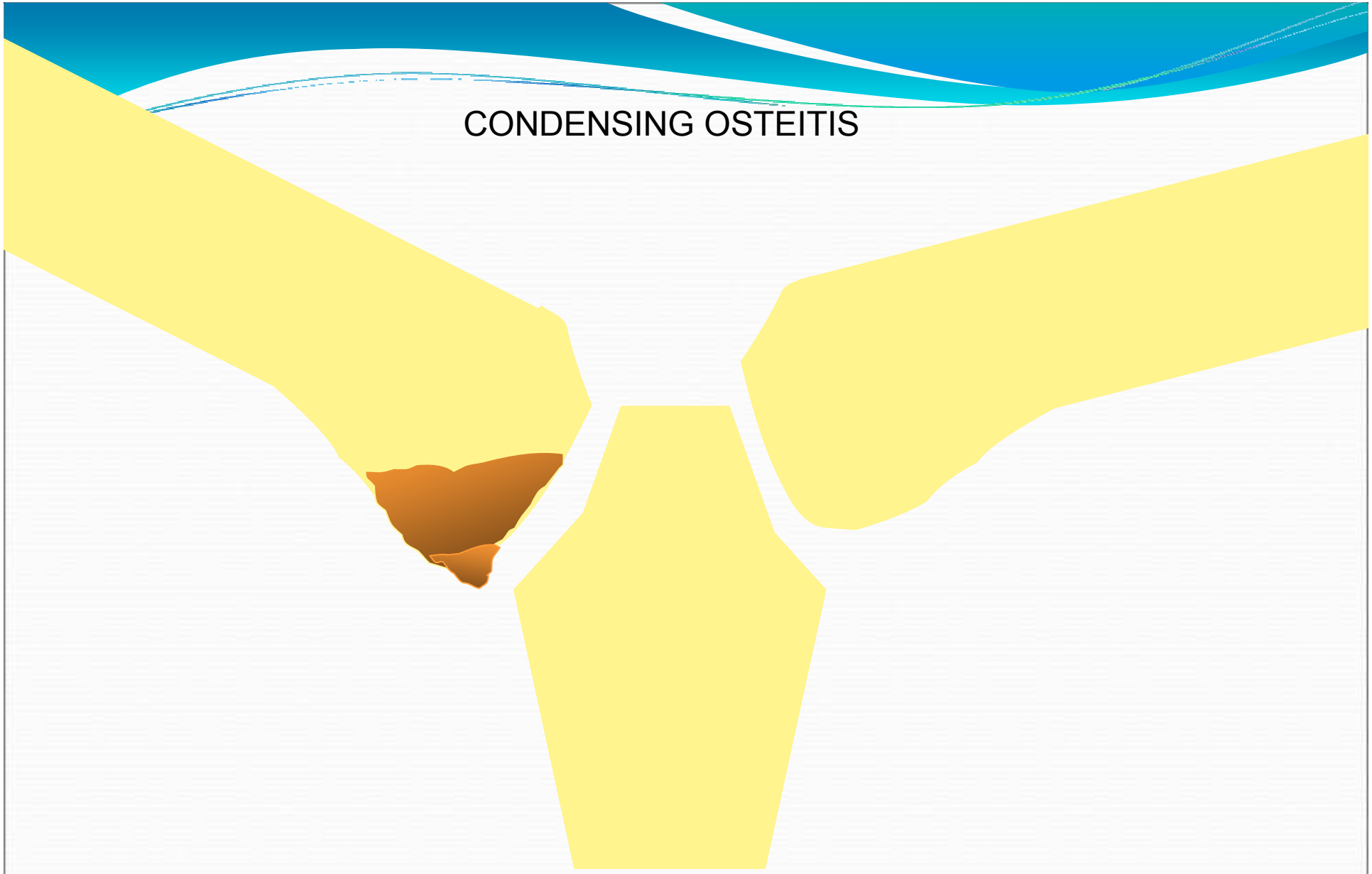


Duffy et al JPO 2002 ; 22(4); 501-505

Condensing Osteitis of the Clavicle

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

CONDENSING OSTEITIS



Unilateral, no involvement of SCJ

Condensing Osteitis

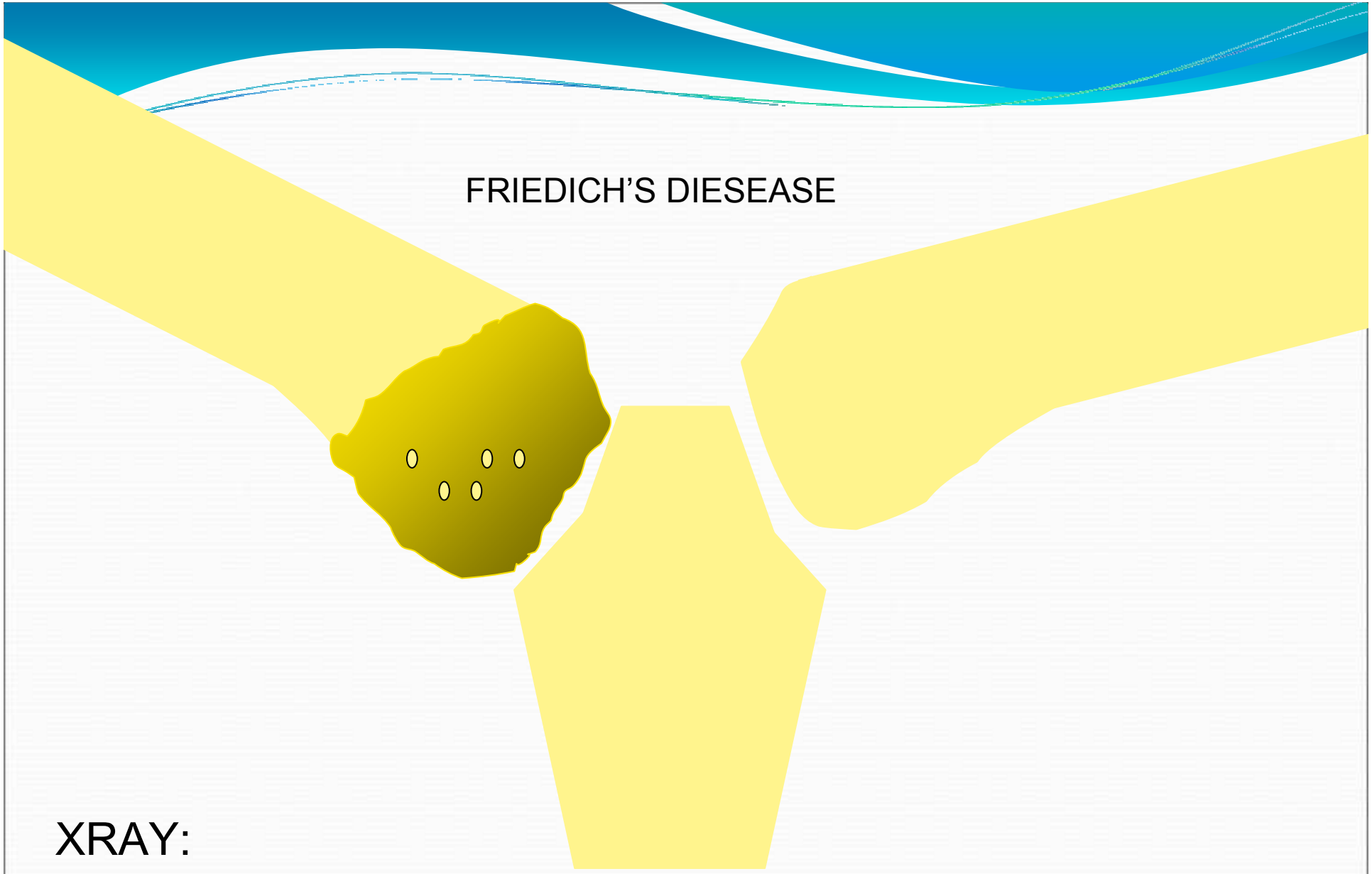
- XRAY, CT
- Biopsy
- Thick trabeculae and cortex.

- 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 DIESEASE



XRAY:

- Irregular SCJ
- destruction of medial end of clavicle

Friedich's disease

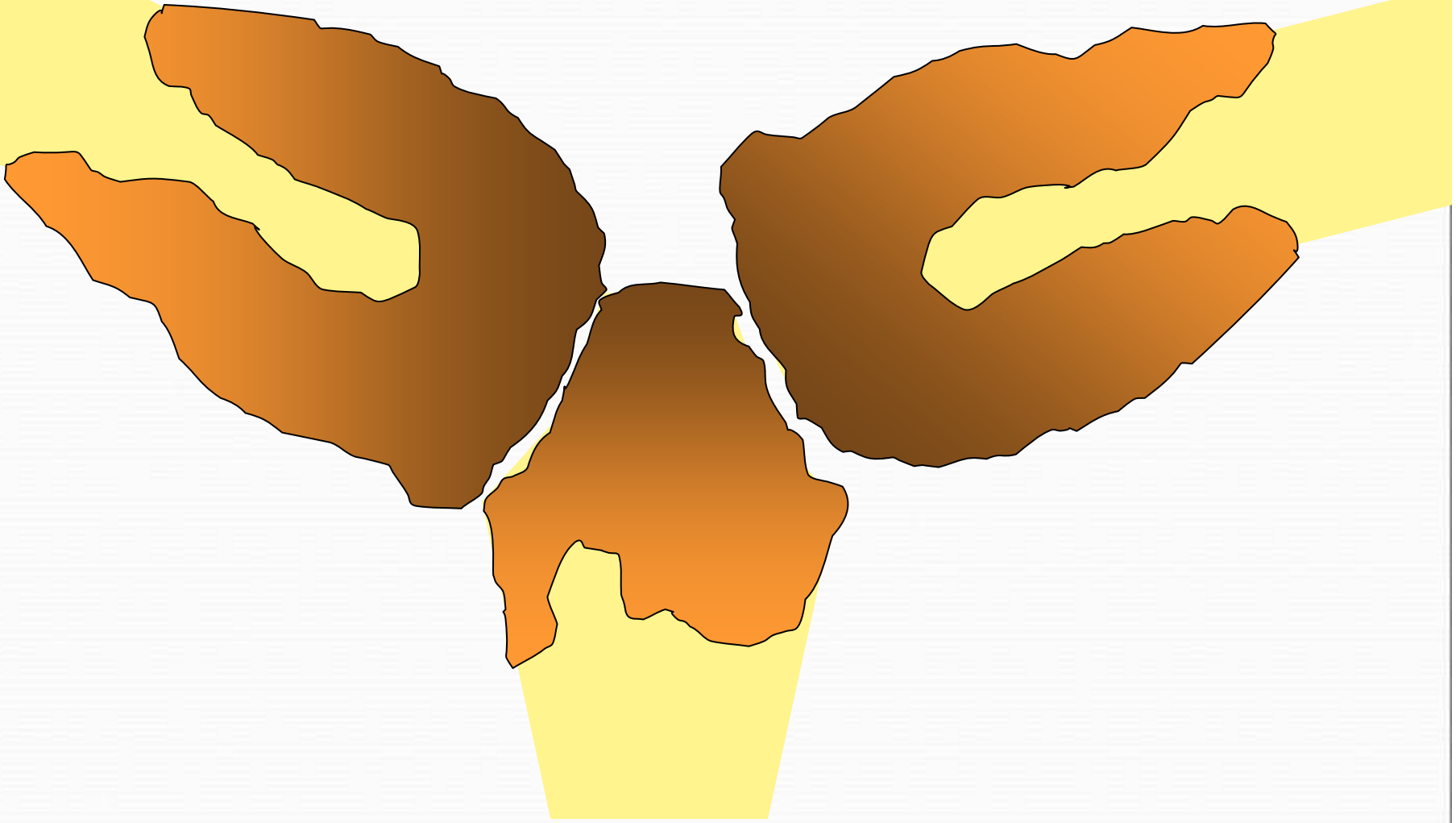
- CT/MRI
- Bone Scan (hot)

- 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

STERNOCLAVICULAR HYPEROSTOSIS



Ossification of ligaments
Ankylosis

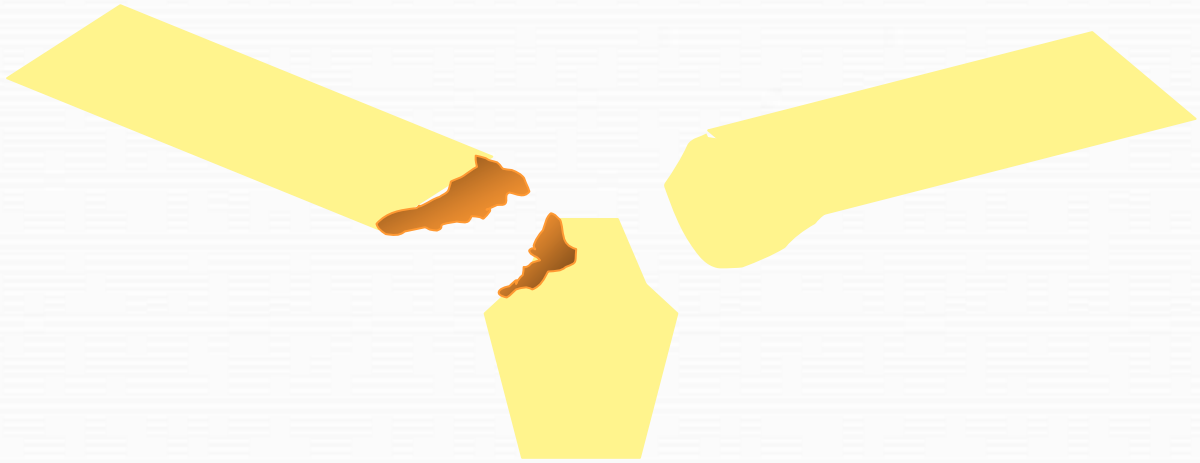
Sternocostoclavicular Hyperostosis

- 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!