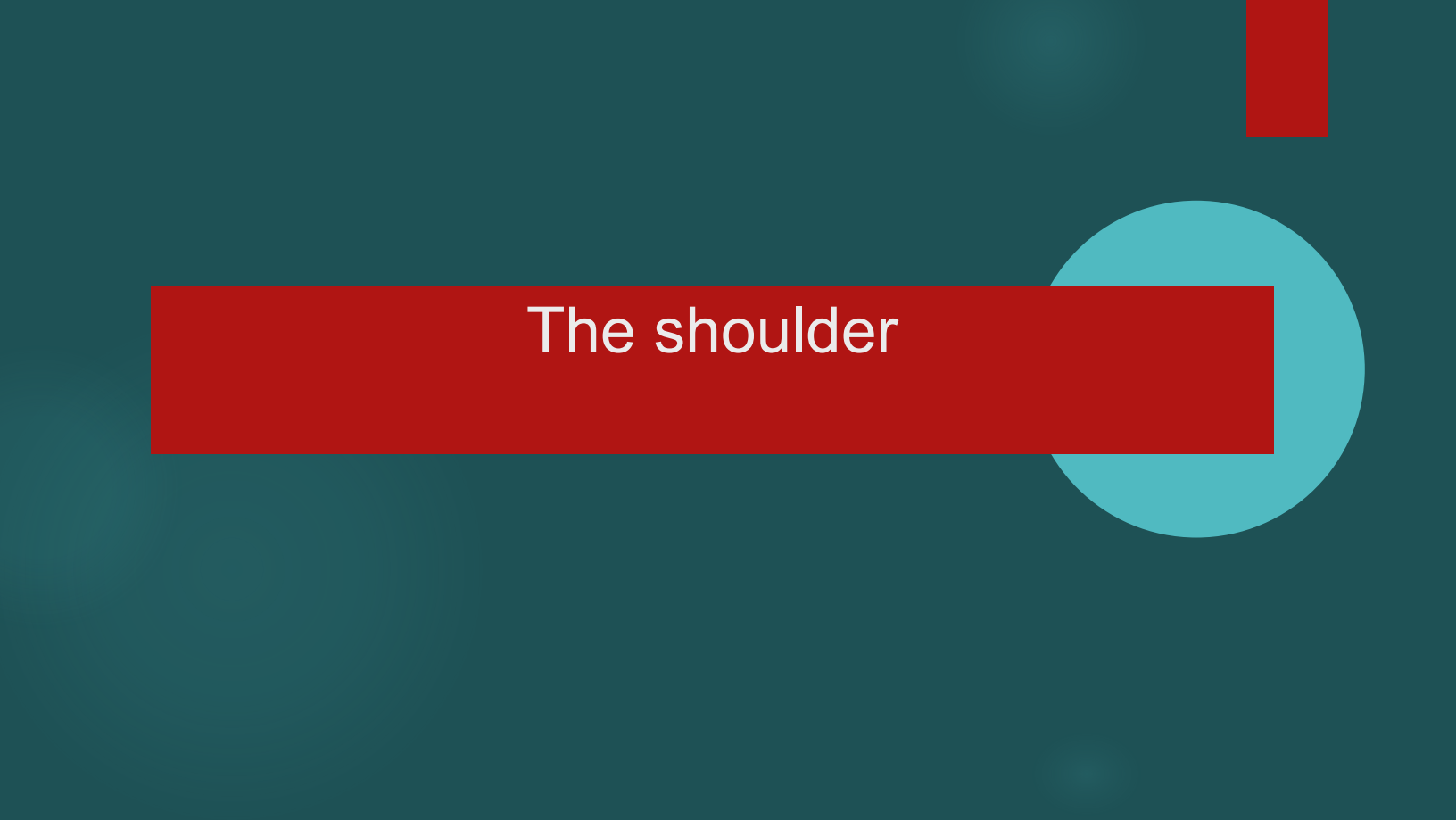


Regional orthopedic

MAHMOUD A.MATAR





The shoulder

Disorders of the rotator cuff

(SITS)

(painful shoulder $\bar{w}$)

The rotator cuff syndrome

= rotator cuff arch
= shoulder impingement \$

- ▶ The rotator cuff is a sheet of conjoined tendons closely applied over the shoulder capsule and inserting mainly into the greater tuberosity of the humerus (subscapularis is inserted into the lesser tuberosity). The cuff is made up of subscapularis in front, supraspinatus above and infraspinatus and teres minor behind (the 'rotator' muscles) which have an important function in stabilizing the head of the humerus by pulling it firmly into the glenoid whenever the deltoid lifts the arm forwards or sideways.

- Rotator cuff from scapula to greater tub. of humerus except subscapularis into lesser tuberosity.
- Fxn of R.C. $\Rightarrow$ stabilize & pressure the humerus tip against acromion during abduction (concentric contraction $\bar{w}$ $\bar{w}$)

to stabilize the shoulder
& prevent dislocation

⇒ shoulder is the most dislocated joint of the body.

- ▶ The commonest cause of pain around the shoulder is a disorder of the rotator cuff – the so-called **rotator cuff syndrome** – which comprises several conditions with distinct clinical features and natural history: **subacute tendinitis** (painful arc syndrome); **chronic tendinitis** (impingement syndrome); and **rotator cuff tears**.

⇒ Shoulder consists of → Acromion process & humeral head
(morphology) & in between RC pass.

→ Morphology of Acromion process differs (3 main types): -

1) straight (flat)

2) curved

3) hooked type Acromion process → RC is under pressure bt 2 bony prominences
(Acromion / humeral head)

فألم حركة لا
tendon شالي 11 shoulder

pressure
& vascular angiogenesis
& congestion & edema
pain

micro tear ←

← microtrauma
during abduction
& pressure bt 2 bony prominences

edema enlarges tendon → more friction → cycle of edema & pain
↓

complete tear of the
tendon.
↓

Pain in special movement (mainly) ← abduction
↓
sudden or after uncustomized activity.

→ The first attack stay (1-2-3---10) days & then resolves spontaneously
or by simple analgesia (NSAIDs) → attack بفردة بسيطة
- after multiple or at the first attack ليس فيه RC pathology
repetitive attacks

(Chronic)

- 3rd Mth decade 11 إلى 15 سنة
- active
- no difference in males & females
- overactivity 12 إلى 14 سنة

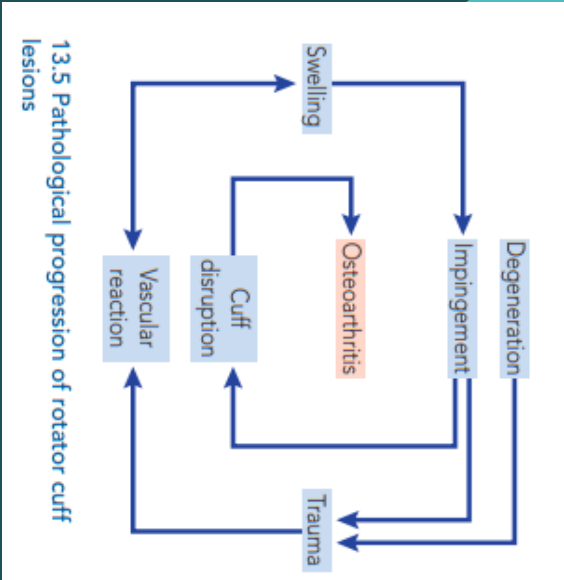
⇒ how to examine the Pt?

- Pain
- limited range of motion.
- Empty can test
↓
pain & tenderness anterior on greater tuberosity
- Stress test (no flexion & extension)
acromion is tender in flexion & extension
more extension is better

Pathology

- ▶ **Degeneration**: degenerates; minute tears develop, scarring, region near its insertion fibrocartilaginous metaplasia or calcium deposition.
 - ▶ **Trauma and impingement**: this may occur when lifting a weight, or when using the arm to save oneself from falling.
 - ▶ **Vascular reaction**: revascularize a degenerate area, this vascular reaction cause congestion and pain
- ‘wear’, ‘tear’ and ‘repair’

- ▶ Degeneration:
- ▶ Trauma and impingement:
- ▶ Vascular reaction:



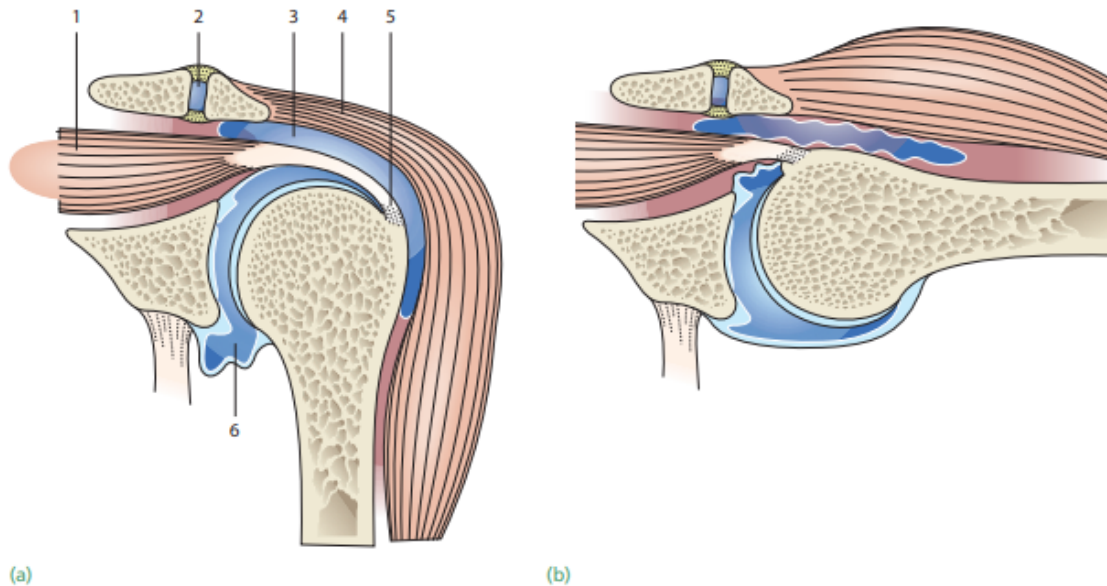
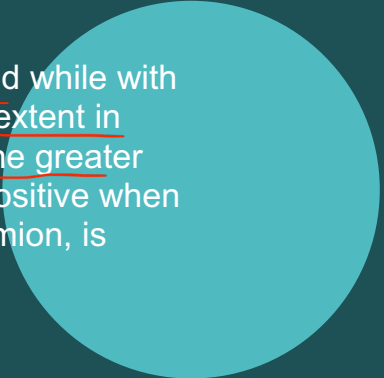


Figure 13.6 Rotator cuff impingement Coronal sections through the shoulder to illustrate show how the sub-deltoid bursa and supraspinatus tendon can be irritated by repeated impingement under the coracoacromial arch or a rough acromioclavicular joint during abduction. (a) Joint at rest. (b) In abduction. Key: 1 Supraspinatus muscle; 2 acromioclavicular joint; 3 subdeltoid bursa; 4 deltoid muscle; 5 supraspinatus tendon; 6 synovial joint.

Symptoms and signs

- ▶ pain and/or weakness during certain movements of the shoulder.
- ▶ Tenderness is felt at the anterior edge of the acromion.
- ▶ ***The painful arc:*** on active abduction 60-120 but pain less if done with arm external rotated.



- 
- 
- ▶ Neer's impingement sign: the scapula is stabilized with one hand while with the other hand the examiner raises the affected arm to the full extent in passive flexion, abduction and internal rotation, thus bringing the greater tuberosity directly under the coracoacromial arch. The test is positive when pain, located to the subacromial space or anterior edge of acromion, is elicited by this manoeuvre.
 - ▶ Can be repeated with the use of lidocaine.

Subacute tendinitis (painful arc syndrome)

- anterior shoulder pain after vigorous or unaccustomed activity, with pain more prominent while the arm in extension and decrease with arm in flexion



(a)



(b)



(c)

Figure 13.7 Supraspinatus tenderness (a) The tender spot is at the anterior edge of the acromion process. When the shoulder is extended (b), tenderness is more marked; with the shoulder slightly flexed (c) the painful tendon disappears under the acromion process and tenderness disappears.

Chronic tendinitis.

- ▶ 40 and 50 years.
- ▶ a history of recurrent attacks of subacute tendinitis,
- ▶ worse at night.
- ▶ slight stiffness.
- ▶ coarse crepitation or palpable snapping over the rotator cuff while passive rotation.



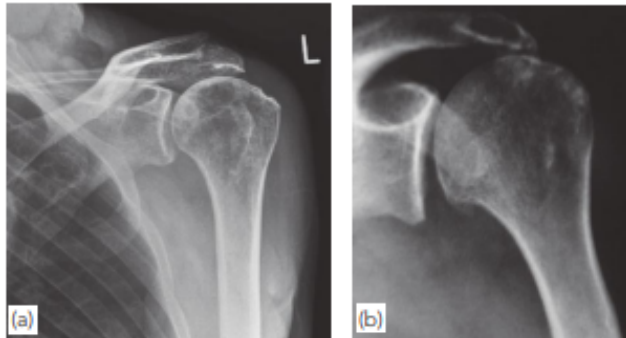
Rotator cuff tears

- ▶ a partial or full thickness tear.
- ▶ over 45 years.
- ▶ shoulder pain with increasing stiffness and weakness.
- ▶ A full thickness tear--There is sudden pain and the patient is unable to abduct the arm. (the 'drop arm sign').
- ▶ Secondary osteoarthritis may develop in long standing case.



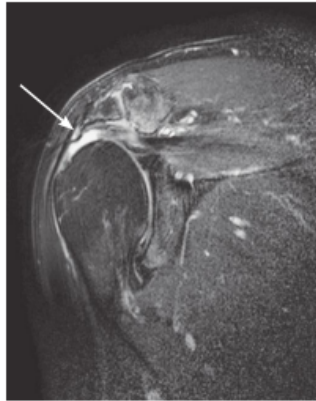
Imaging

- ▶ **X-rays** are usually normal in the early stages of the cuff dysfunction,
- ▶ erosion, sclerosis or cyst formation at the greater tuberosity.



13.7 Acute calcification of supraspinatus The dense mass in the tendon (a) is gradually resorbed or dispersed into the subdeltoid bursa (b).

- ▶ **MRI** can effectively show cuff pathology.
- ▶ Changes on MRI always need to be correlated with the clinical examination



13.8 Rotator cuff tear – MRI High signal on MRI, indicating a full-thickness tear of the rotator cuff.

Treatment

Conservative treatment

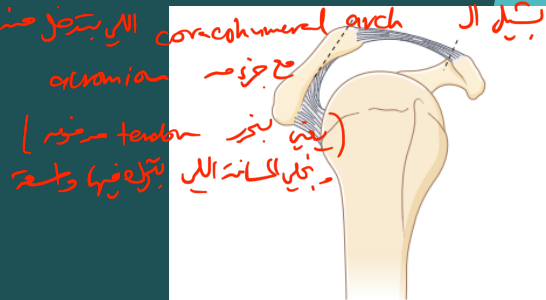
- 1 ▶ avoiding the 'impingement position'. (Rest)
- 2 ▶ Physiotherapy, including ultrasound and active exercises in the 'position of freedom'.
- 3 ▶ non-steroidal anti-inflammatory. + Rest (2 weeks of rest)
- 4 ▶ Local injection of corticosteroids

edema - NSA antiinflamm -
imp - 2 weeks of rest
local injection -
steroids -
if no response → surgery

> Role of physiotherapy $\Rightarrow$ widening of the space
(humeral head depression)
يقوي العضلة التي ينزل الكف ويساعد على
التي تمشي فيها tendon
فصل friction

Surgical treatment

- ▶ No response to conservative treatment after 3 months.
 - ▶ (acromioplasty). →
 - ▶ open surgery or arthroscopy.
 - ▶ Repair of rotator cuff tears.
1. Young.
 2. Active.
 3. Chronic pain .
 4. Loss of function.



13.9 Impingement syndrome – surgical treatment The coracoacromial ligament and underside of the anterior third of the acromion are removed to enlarge the space for the rotator cuff. This can be performed by open surgery or arthroscopically.

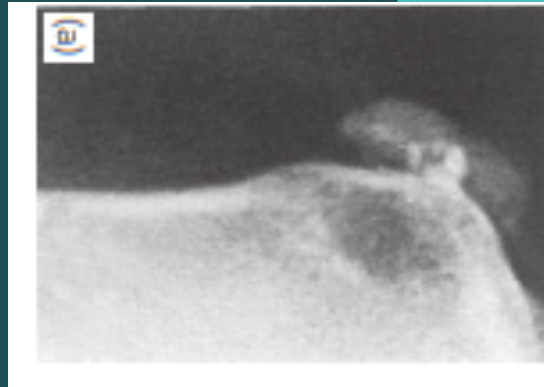
Calcific tendinitis

- ▶ Calcium hydroxyapatite crystals are deposited in the supraspinatus tendon.
- ▶ fibrocartilaginous metaplasia from local ischaemia.
- ▶ disappear entirely within a few weeks.
- ▶ Calcification alone is probably not painful

▷ All ROM are limited.

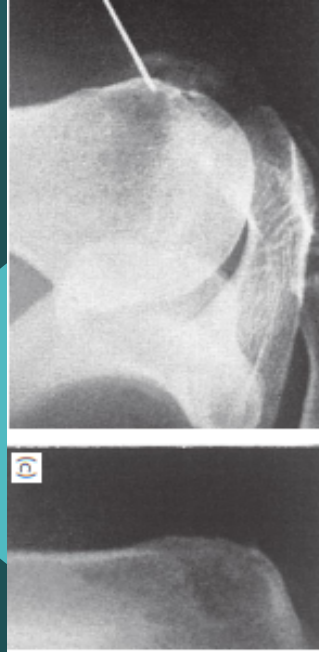
Clinical features

- ▶ 30–50 year olds.
- ▶ Pain which is progressive within hrs to sever.
- ▶ Within few days it reduce and disappears.
- ▶ X-rays Calcification just above the greater tuberosity (cotton piece on G.T.)



Treatment

- ▶ Rest in sling.
- ▶ NSAID.
- ▶ Local injection.
- ▶ Extracorporeal shockwave therapy.
- ▶ drain the pasty calcium deposit under ultrasound guidance ('barbotage')

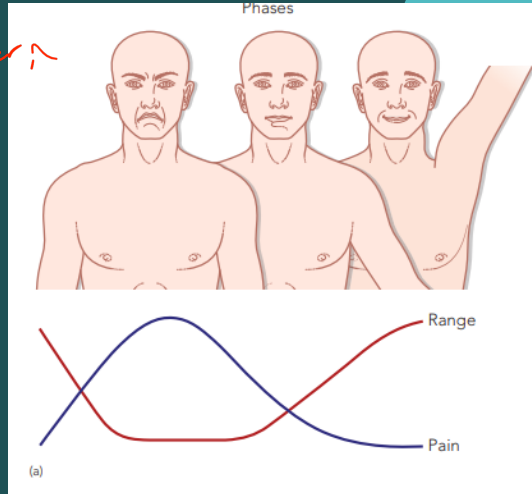


Adhesive capsulitis ('frozen shoulder')

↳ Fibrosis of capsule.

- ▶ progressive pain and stiffness which usually resolves *→ (self limiting d2)*
spontaneously, within 18 months.
- ▶ Unknown cause. *but could happen after:*

- 1) Sudden trauma
- 2) cardiac events
- 3) as a part of complex regional pain S.



Hand-shoulder Syndrome ← stiffness in wrist & shoulder
which is part of CRPS. while elbow spared & free

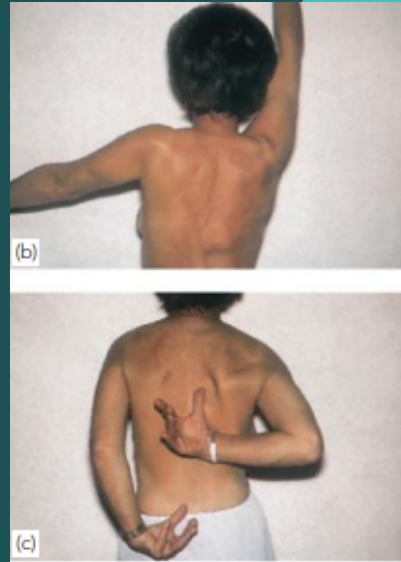
سبب الألم severe بدرجة سيئة جداً و - يرجع شدة midline (طال إن شغل)

~ stiffness سيئة جداً بدرجة سيئة جداً بدرجة سيئة جداً (عكس الألم)

→ Face of Pt reflects severity of pain.

Clinical features

- ▶ 40–60 years, with history of trauma.
- ▶ muscle wasting. *limited ROM.*
- ▶ X-rays are normal.



Differential diagnosis

1. Post-traumatic stiffness.
2. Disuse stiffness.
3. Regional pain syndrome.
4. Arthritis.



Treatment

► Conservative treatment :-

1. NSAID. (Analgesic)
2. Local heat and exercise
3. The role of physiotherapy and steroid injections is unproven.
4. manipulation under anaesthesia, distending the joint with saline until the capsule ruptures. (Intracapsular injection of saline for expansion of joint & capsule)

► Operative treatment:-

Arthroscopic division of the interval between supraspinatus and infraspinatus may dramatically improve the range of movement

بفتح الفرجة بين الكتف والكفة

لوحظت زيادة الحركة
خارجية بعد
الجراحة
التي تسمى
the whole shoulder/capsule/

synovium (بفتح السين) يتم إزالة الطبقة
الداخلية layer by layer
بفتح الالف capsule، كفتح open (بفتح الالف)

Lesions of the biceps tendon

Tendinitis

- ▶ Not apart of the rotator cuff.
- ▶ May be involved in the rotator cuff pathology.
- ▶ Isolated lesion rare.
- ▶ after unaccustomed shoulder strain.
- ▶ Young adult. *+ active.*
- Vague* ▶ Pain and tenderness are sharply localized to the bicipital groove. *or wide separate*
 - ▶ (resisted elbow flexion and supination) will provoke the pain
 - ▶ Rest, local heat and deep transverse frictions
 - ▶ corticosteroid injection



Torn long head of biceps

- ▶ common and is often associated with rotator cuff problems.
- ▶ middle-aged or elderly.
- ▶ While lifting a heavy object, he or she feels something snap.
- ▶ bruising appears over the front of the arm.
- ▶ Soon the ache subsides and good function returns,
- ▶ Lump may be first presentation *with*

(injection)

He is physiotherapy to regain muscle power.



⇒ surgery in ruptured biceps depends on level of fix.

(لو nondominant
hand)

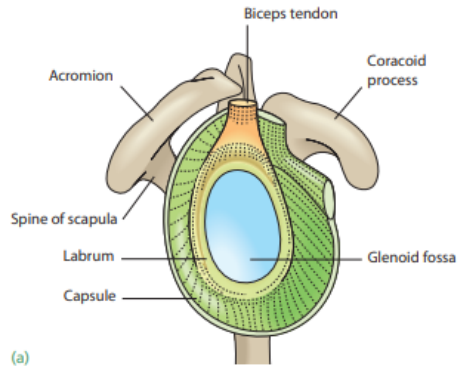
نكون نلزمه المبرح، حتى نبتعد عن اليد

→ surgery depends on functional level of the pt (as it's mostly asymptomatic).

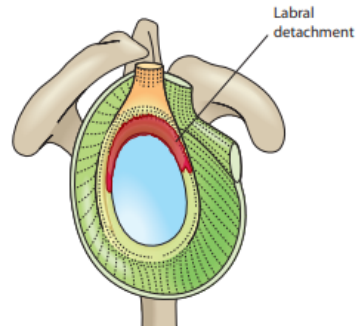
post trauma -> SLAP lesions (Sup. labrum anterior & posterior)
20% of SLAPs -> painful shoulder condition

- ▶ A fall on the outstretched arm.
- ▶ superior part of the glenoid labrum anteriorly and posteriorly (SLAP)
- ▶ a painful 'click' on lifting the arm above shoulder height.
- ▶ MRI arthrography is the modality of choice,
- ▶ Surgically treated arthroscope
 - ↳ grunting or coarse crepitation in shoulder.

⇒ the main cause of painful, grunting shoulder & main cause of dislocation is SLAP lesion



(a)



(b)

Figure 13.17 SLAP lesions (a) Diagram of the normal anatomy, looking into the glenoid fossa. Note that the biceps tendon takes its origin from the superior part of the labrum. (b) The labrum may tear or become detached from the glenoid. This illustration shows a partial tear. Other types are described in the text.

Chronic instability of the shoulder

(ant. dislocation) RTA / Fall from height Traumatic
 Atraumatic } (Dislocation) → Ant. (mc 90%)
 } → Post.
 } Multidirectional

(according to anatomical site of dislocation)

- ▶ wide range of movement at the cost of stability.
- ▶ fibrocartilaginous glenoid labrum and the surrounding ligaments and muscles. Are the stabilization process.

(ant. 60% humerus) → **Anterior dislocation** (the most common)

- ❑ forced abduction, external rotation and extension .
- ❑ labrum and capsule are often detached from the anterior rim of the glenoid (the classic Bankart lesion).

(posterior 10% humerus) → **Posterior dislocation** is rare

- ❑ a violent jerk in an unusual position, epileptic fit or a severe electric shock.

(6% for humerus)

Atraumatic instability → 12 redundant capsular & tendon
& muscle around joint
↓

- ❑ capsular and ligamentous laxity / dysfx.
- ❑ weakness of the shoulder muscles.
- ❑ No anatomical derangement.

Shoulder becomes easy
dislocatable.

↓

The most difficult course

↓

Superiorly, while joint is
high failure line

Anterior instability → head of humerus goes anterior

- ▶ 95% of cases.
- ▶ as sequel to acute anterior dislocation.
- ▶ In those over 50 years, dislocation is often associated with a rotator cuff tear.after acute dislocation.
- ▶ In young adult mostly associated with recurrent dislocation.
- ▶ detachment or stretching of the glenoid labrum and capsule.

Clinical features

(fear of instability without pain)

- ▶ the shoulder repeatedly 'coming out of joint' during over-arm movements (lifting the arm in abduction, extension and external rotation),
- ▶ **apprehension sign** With the patient seated, the examiner cautiously lifts the arm into abduction, external rotation and then extension; at the crucial moment the patient senses that the humeral head is about to slip out anteriorly and his body tautens in apprehension.

قلبه لوقوف
احداله

شد اعضاءه

proximal part of humerus
velocation test
كله الحركه

بنيت ال clavicle وبنيت ال
الريف (no pain) لكره الريف يقولك ابي فلفه، ضبل
الانبي، بنك كنه لجا فبراج دبرج السور بلخوف.



13.13 Shoulder instability – the apprehension test (a) This is the apprehension test for anterior subluxation or dislocation. Abduct, externally rotate and extend the patient's shoulder while pushing on the head of the humerus. If the patient feels that the joint is about to dislocate, she will forcibly resist the manoeuvre. (b) Posterior dislocation can be tested for in the same way by drawing the arm forward and across the patient's body (adduction and internal rotation).

True appreh. test :-

1) produce pain X

2) , sense of instability ✓

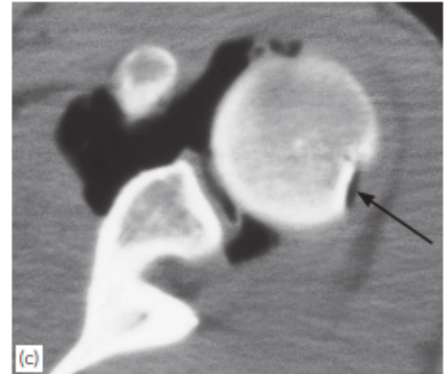
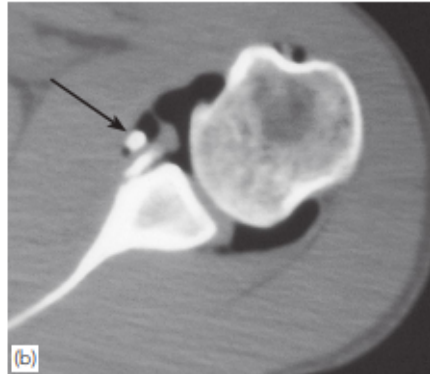
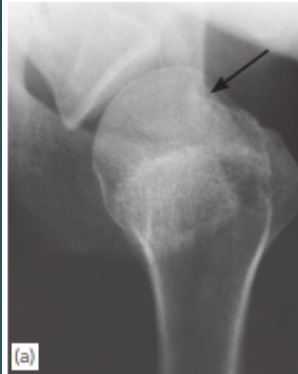
3) , crepitus X

Dis

→ X-ray could be normal in atraumatic dislocation (as there is no anatomical derangement).

Imaging

► x-ray



13.14 Anterior instability – imaging (a) The plain x-ray shows a large depression in the posteriosuperior part of the humeral head (the Hill-Sachs sign). (b,c) MRI shows both a Bankart lesion with a flake of bone detached from the anterior edge of the glenoid, and the Hill-Sachs lesion (arrows).

Treatment → سولجی

▶ Conservative.

▶ operative treatment

1. frequent dislocations, especially if these are painful.
2. Function lost.

▶ The glenoid labrum is re-attached, together with tightening of the anterior capsule.

→ in elderly → long term dislocation leads to rupture rotator cuff.
after resolution of acute dislocation
→ in young → recurrent dislocation occurs after = = = =

Posterior instability

- ▶ Recurrent subluxation rather than dislocation.
- ▶ when the arm is held in flexion and internal rotation.
- ▶ Treatment is usually conservative – muscle strengthening exercises and voluntary control of the joint.
- ▶ Operative reconstruction is indicated only if disability is marked



Atraumatic instability

- ▶ shoulder going 'out of joint' with remarkable ease.
- ▶ swimmers and throwers.
- ▶ physiotherapy to strengthen the muscles and to restore proprioception.
Just occasionally surgery is needed to tighten the capsule

⇒ There are 3 conditions in shoulder girdle that can lead to neck problem:-

1) Sprengel shoulder (underscending scapula)

2) Klippel - Feil \$.

3) Winged scapula.

3rd month of
fetal life

or neck N 11th scapula ⇐

congenital elevation of the scapula
(sprengel's shoulder)



congenital elevation of the scapula (sprengel's shoulder)

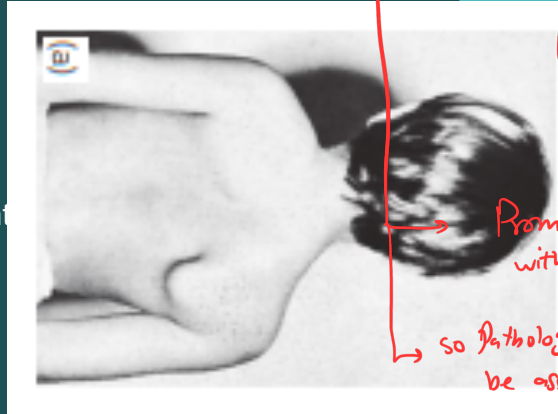
- ▶ scapulae normally complete their descent from the neck by the third month of fetal life.
- ▶ the scapula looks and feels abnormally high, smaller than usual and somewhat prominent.
- ▶ painless, but abduction may be limited.
- ▶ kyphosis or scoliosis may be present

cosmetic → Surgery or conservative

reaching scapula down
thoracic cage is visible posteriorly

Failure of scapula to descend for unknown reason (upward fix.)

Pathology is mainly cosmetic as pt can do some abduction (weaker & limited than the CL side but still can do it)



Prominent (high) scapula subQ with some limitation of the shoulder

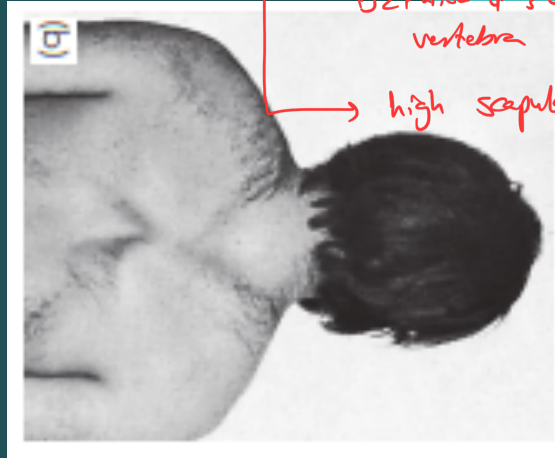
so Pathology may be cosmetic or could be associated with spinal malformation (scoliosis / kyphosis)

Klippel-Feil syndrome

- ▶ rare congenital disorder.
- ▶ bilateral failure of scapular descent and fusion of several cervical vertebrae.
- ▶ Short webbed neck (كرضة)
- ▶ cervical mobility is restricted.
- ▶ left untreated.

DDx :-

↳ Turner & (due to webbed neck)



سبب الطول قصير

محدودية الحركة (Limited ROM)
في الجزء الأعلى (رقبة/عنق)

فقط trunk التي يتحرك
but cervical neck don't move,
D2 Fusion of 3 or more of cervical
vertebrae (تصلب/تجميد)

high scapula → لا تنزل بل تبقى
omocervical part
منطقة عنق

Medial winging
Lateral winging

Winged scapula

self limiting d2 unless
there's long thoracic n. injury
(persistent winging)

تندون ترانسفر لى سيراتوس انٲرئور
tendon transfer for serratus anterior.

it's also called snapping scapula
(عظما ٲترلة)

- ▶ the scapula juts out under the skin,
- ▶ weakness of the serratus anterior, the muscle which stabilizes the scapula on the thoracic cage.
- ▶ (pushing hard against a wall).
- ▶ damage to the long thoracic nerve. & Bell
- ▶ fifth, sixth and seventh cervical nerve roots.
- ▶ neuralgic amyotrophy.
- ▶ muscular dystrophy.
- ▶ self-limiting and the condition gradually improves. or tendon transfer.

⇒ when scapula is moving medially or laterally while pushing a hard object → winged scapula due to defect in the muscle or lig. or viral infection affecting nerve.



⇒ it is conservative, self limiting, physiotherapy, muscle strengthening
↓
surgery if needed



THE ELBOW

Cubitus varus

- ▶ ('gun-stock') deformity .
- ▶ Elbow extended and the arms are elevated.
- ▶ malunion of a supracondylar fracture.
- ▶ wedge osteotomy of the lower humerus.

(surgery) →

بني جزي - distal humerus
وينفخ ان ويندك .



→ functionally, baby having cubitus varus is very active

it's very bad

cosmotically

but normal functionally

بني جزي - distal humerus
وينفخ ان ويندك .

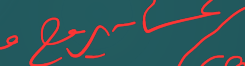
Valgus →  forearm
 Varus → 

Cubitus valgus

functionally very well

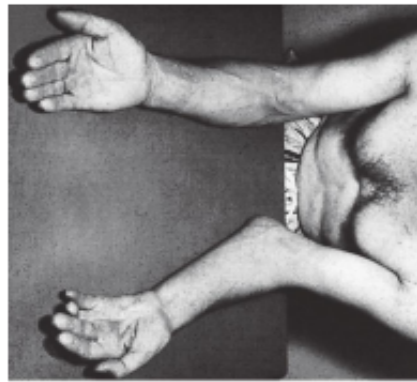
- ▶ non-union of a fractured lateral condyle.
- ▶ delayed ulnar palsy to develop; years after the causal injury.
- ▶ e deformity itself needs no treatment.

th → Ulnar nerve transposition

nerve is in
 → 
 under pressure } cause stretching of ulnar nerve → ulnar n. palsy

→ No need for surgery for cubitus valgus

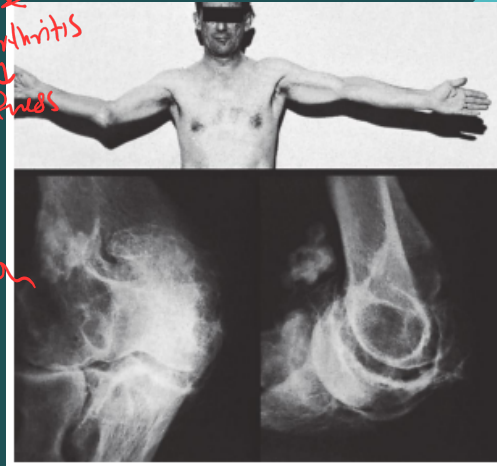
14.2 Cubitus valgus This man's valgus deformity, the sequel to an ununited fracture of the lateral condyle, has resulted in an ulnar nerve palsy.



Stiff elbow → limited functional ROM of elbow.

- ▶ Disabling condition.
- ▶ trauma, congenital, arthritis.
- ▶ physiotherapy, surgery.

RA causing chronic synovitis & chronic osteoarthritis stiffness
chronic or myositis ossificans causing imp & limited ROM.



Post-trauma prolonged immobilization
(w/o R wrap)
↓

don't fix elbow with elbow
cast more than 6 weeks → otherwise you'll go for stiff elbow.
one of the most difficult ortho. problem to be solved.

⇒ tb → if functional level of elbow ROM is maintained → Do nothing

↳ if limited ROM / stiff / severe OA → total elbow joint
replacement

(مستوى التمرير
الركب بظنون)

Olecranon bursitis

(gouty tophi leads to olecranon bursa)

- ▶ as a result of pressure or friction over olecranon
- ▶ infection, gout or rheumatoid arthritis.
- 1) ▶ Treat underline cause.
- 2) ▶ Drain septic bursa.
- 3) ▶ Excision .

irritates the bursa

14.5 Olecranon bursitis The enormous red lumps over the points of the elbows are due to swollen olecranon bursae; the patient's ruddy complexion completes the typical picture of gout.



Clinical pic :-

- 1) asymp. ok. bursa → no need for it unless it wants it to be removed → ^{driv}Excision of the bursa.
- 2) abscess formation → I&D if infected & then after resolution of infection
- 3) sinus

Tennis elbow' and 'golfer's elbow'

- ▶ a natural degenerative process in the tendon aponeuroses attached to either the lateral or medial humeral epicondyle
- ▶ Unknown cause.
- ▶ Pain follow occupational stress or unaccustomed activity.
- ▶ wrist movements and forearm muscle contraction.

Clinical features

→ painful elbow joint D2 inflam process affecting common extensor
origin at lateral condyle

- ▶ **'tennis elbow'**, pain is felt over the outer side of the elbow, but in severe cases it may radiate widely
- ▶ flexion and extension are full and painless.
- ▶ Pain with forearm contraction in pronation.
- ▶ Tender just over lateral epicondyle.
- ▶ extend the wrist against resistance, or simply by passively flexing the wrist so as to stretch the common extensors.
- ▶ **'golfer's elbow'**, tenderness over medial epicondyle.
- ▶ pain is reproduced by passive extension of the wrist in supination.

→ affecting common flexor origin at medial epicondyle.

Treatment

- ▶ Rest, or avoiding the precipitating activity. + Analgesia
- ▶ A splint and physiotherapy. & ES & IL & US
- ▶ Steroid injection. [if not responsive]
- ▶ Surgery. (detaching the tendon from its origin)

[detaching extensor or flexor origin from bone attachment]

- it will be fixed again but we do some neovascularization -



14.6 Tennis elbow

(a) Tenderness over the lateral epicondyle. (b) Pain is provoked by resisted wrist extension. (c) Extensor carpi radialis brevis origin may have to be released.

The image features a solid teal background. A horizontal red bar is positioned across the middle, containing the text 'THE WRIST' in white. To the right of the bar, a large light blue circle is partially visible, with the red bar overlapping its left side. In the top right corner, there is a small red vertical rectangle.

THE WRIST

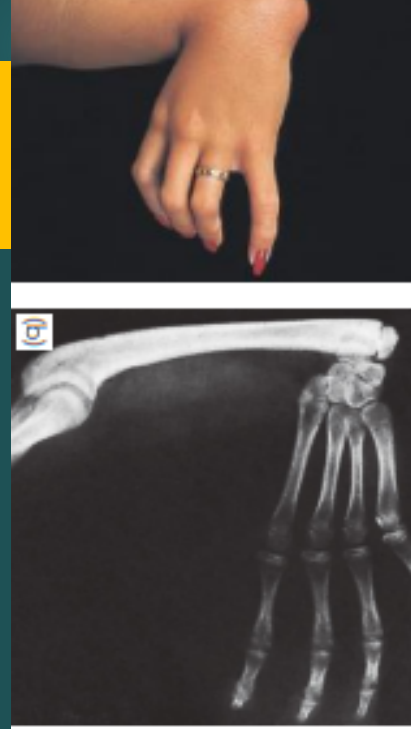
Wrist deformities

- ▶ 1 in 600 live births.
- ▶ rare conditions.
- ▶ appear together in the forearm, wrist and hand.
- ▶ associated congenital abnormalities.



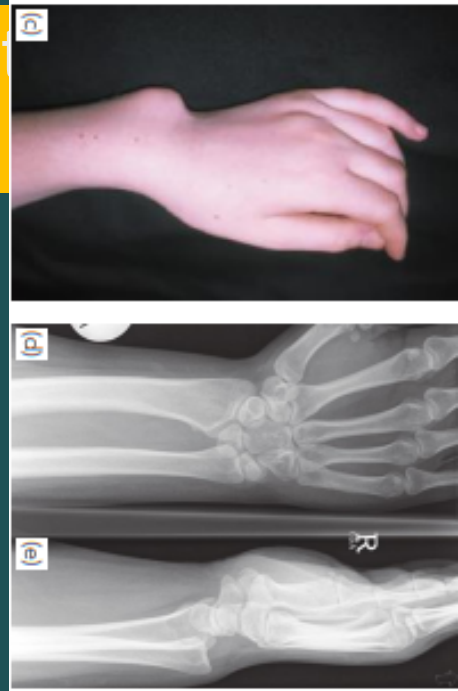
Radial dysplasia

- ▶ the wrist in marked radial deviation(radial club-hand).
- ▶ Bilateral in 50%.
- ▶ absence of the whole or part of the radius, and usually also the thumb.
- ▶ gentle stretching and splintage,in neonatal period.
- ▶ 'centralizing' the carpus,before the age of 3 years.
- ▶ recurrence of the deformity is high.
- ▶ Always examine the elbow: if the joint is stiff



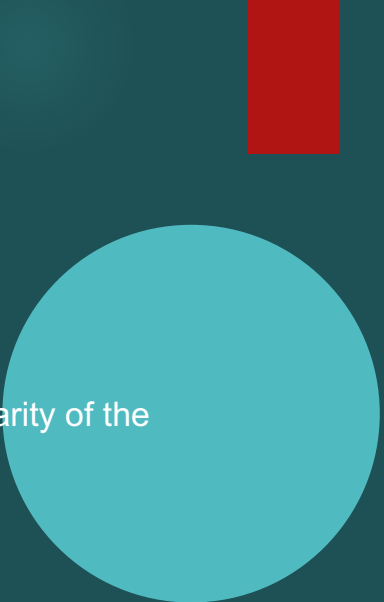
Madelung's deformity

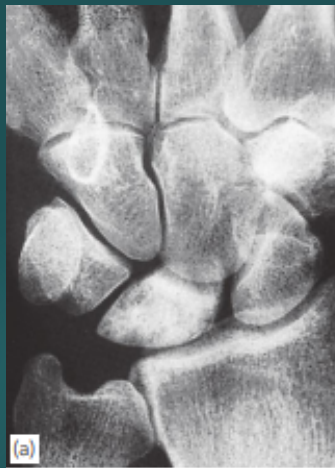
- ▶ the lower radius curves forwards (ventrally), carrying with it the carpus and hand.
- ▶ the distal end of the ulna projecting on the back of the wrist.
- ▶ At birth ,but present around age of 10 years,then increase till growth complete.
- ▶ Function well .
- ▶ Ulna shortening with or without radial lengthening.
- ▶ May be no treatment



Kienböck's disease

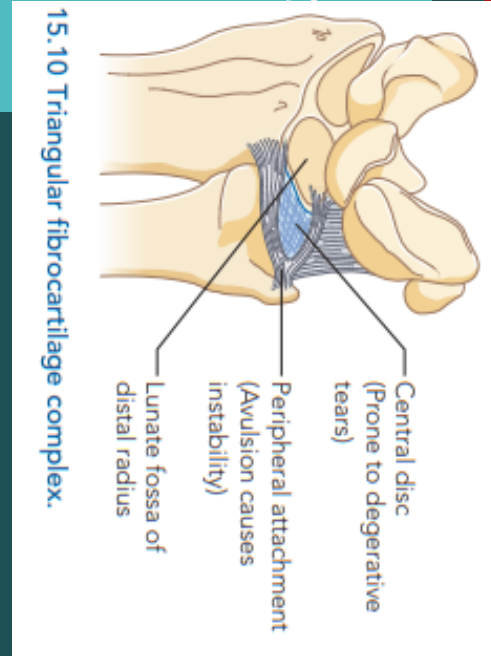
- ▶ avascular necrosis of lunate bone.
- ▶ (negative ulnar variance).
- ▶ result in excessive stress being applied to the lunate where it is squeezed between the distal surface of the (overlong) radius and the second row of carpal bones.
- ▶ a young adult, complains of ache and stiffness.
- ▶ Tenderness is localized to the centre of the wrist on the dorsum.
- ▶ wrist extension limited.

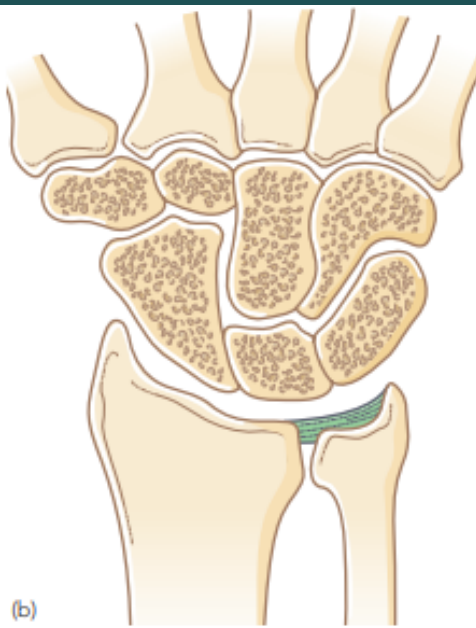
- 
- ▶ X-ray normal in early stage/
 - ▶ MRI is diagnostic in the early disease.
 - ▶ increased density in the lunate and, later, flattening and irregularity of the bone. osteoarthritis of the wrist.
 - ▶ Radial osteotomy shortening.
 - ▶ Microsurgical revascularization of the bone .
 - ▶ partial wrist arthrodesis or proximal row excision or even joint replacement are considered.



Tears of the triangular fibrocartilage TFCC

- ▶ from the base of the ulnar styloid process to the medial edge of the distal radius.
- ▶ like a meniscus in the wrist joint.
- ▶ Pain and loss of grip.
- ▶ clicking on supination of the forearm.
- ▶ MRI or arthroscopy.
- ▶ Repair or debridement.
- ▶ Open or arthroscopy.





15.3 X-rays (a) Note the shape and position of the bones which make up the wrist:

(A) scaphoid, (B) lunate, (C) triquetrum overlain pisiform, (D) trapezium, (E) trapezoid, (F) capitate, (G) hamate

(b) Schematic section showing the carpal articulations and the triangular fibrocartilaginous ligament (coloured green).

Ulnocarpal impaction

- ▶ impaction of the ulnar head against the ulnar side of the lunate and ulnocarpal arthritis (the ulnocarpal impaction syndrome)
- ▶ Long ulna.
- ▶ Post impacted distal radius fracture(short radius).
- ▶ X-ray ('positive ulnar variance').
- ▶ simple analgesics, splintage and steroid injections.
- ▶ arthroscopic excision of the distal dome of the ulnar head may be successful.
- ▶ Ulna shortening osteotomy.

De Quervain's disease

- ▶ Tenosynovitis of the first dorsal compartment.
- ▶ (abductor pollicis longus and extensor pollicis brevis)
- ▶ women between the ages of 30 and 50 years.
- ▶ Post repetitive microtrauma.
- ▶ Pain, and sometimes swelling, is localized to the radial side of the wrist.
- ▶ tendon sheath feels thick and hard.
- ▶ Tenderness is most acute at the very tip of the radial styloid.
- ▶ The pathognomonic sign is elicited by Finkelstein's test.
- ▶ ultrasound therapy or a corticosteroid injection .
- ▶ Surgery.



15.12 De Quervain's disease (a) There is point tenderness at the tip of the radial styloid process. (b,c) Finkelstein's test: ulnar deviation with the thumb left free is relatively painless (b), but if the movement is repeated with the thumb held close to the palm (c), the pull on the thumb tendons causes intense pain. (d) Injecting the tendon sheath.

Ganglion

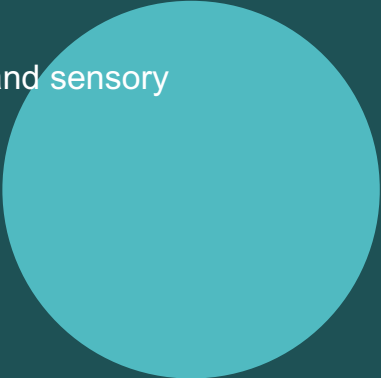
- ▶ cystic degeneration in the joint capsule or tendon sheath. The distended cyst contains a glairy fluid.
- ▶ Typically at dorsum of the wrist.
- ▶ a young adult, with painless lump not tender .
- ▶ Disappear within months.
- ▶ Aspiration.
- ▶ Excision with recurrence rate 30%



15.13 Volar wrist ganglion

Carpal tunnel syndrome

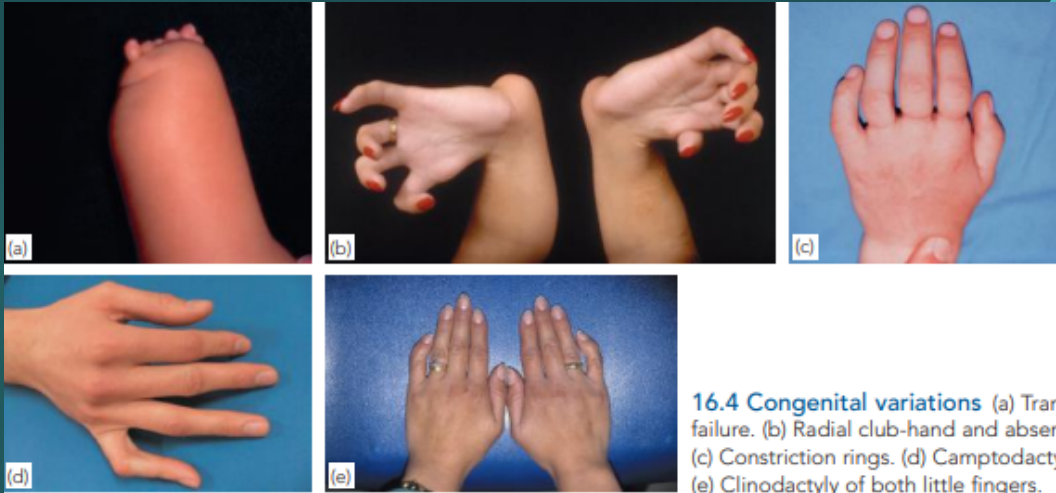
- ▶ Median nerve compression at wrist level.
- ▶ women at the menopause, rheumatoid arthritis, in pregnancy and in myxedema.
- ▶ 40–50 years.
- ▶ Pain and paraesthesia occur in the distribution of the median nerve in the hand.
- ▶ Patients tend to seek relief by hanging the arm over the side of the bed or shaking the arm.
- ▶ percussing over the median nerve (Tinel's sign) or by holding the wrist fully flexed for a minute (Phalen's test)

- 
- 
- ▶ wasting of the thenar muscles, weakness of thumb abduction and sensory dulling in the median nerve territory.
 - ▶ Consider radicular symptom.
 - ▶ Diagnosis is clinical.
 - ▶ EMG & NCV.
 - ▶ Light splints that prevent wrist flexion.
 - ▶ Steroid injection into the carpal canal.
 - ▶ Open release.
 - ▶ Wait in pregnancy.



15.14 Median nerve compression (a) In the right hand there is wasting of the thenar eminence. (b) Testing for abductor power shows that it is weaker than that in the normal hand. (c) Area of diminished sensibility. (d) Tapping on the nerve may cause tingling in the hand (Tinel's sign), and holding the wrist flexed for 2 minutes may also produce tingling in the median nerve distribution (e).

THE HAND



16.4 Congenital variations (a) Transverse failure. (b) Radial club-hand and absent thumb. (c) Constriction rings. (d) Camptodactyly. (e) Clinodactyly of both little fingers.

Dupuytren's contracture

- ▶ a nodular hypertrophy and contracture of the palmar aponeurosis.
- ▶ Familial.
- ▶ Diabetes, (AIDS), epilepsy receiving phenytoin therapy, Smoking and heavy alcohol consumption are also risk factors.
- ▶ a middle-aged man – complains of a nodular thickening in the palm. involve the ring or little finger.
- ▶ Pain is unusual. The palm is puckered, nodular and thick.
- ▶ flexion deformities at the MCP and PIP joints.
- ▶ (Ledderhose's disease). similar nodules may be seen on the soles of the feet
- ▶ Peyronie's disease.

- ▶ If the deformity is static no treatment.
- ▶ Surgical release.
- ▶ injection of a drug, collagenase, to dissolve the cord



16.5 Dupuytren's disease Contractures at (a) the palmar crease and (b) the proximal interphalangeal joint. (c) Z-plasty shortly after operation and (d) 2 weeks later.

Ulnar 'claw-hand' (intrinsic-minus deformity)

- ▶ hyperextension at the MCP joints and flexion at the IP joints.
- ▶ paralysis of the intrinsic muscles which normally activate MCP flexion and IP extension.



16.6 Ulnar 'claw-hand' (a) High ulnar nerve paralysis causing a partial claw-hand deformity: the paralysed intrinsic muscles cause the loss of flexion at the MCP joints and loss of extension at the IP joints, but because flexor digitorum profundus (FDP) is also partially paralysed the index and middle fingers are straight. (b) Low ulnar nerve paralysis (lower than the innervation of FDP), causing a total claw-hand deformity in which all the long flexors are still active.

Shortening of intrinsic muscles (intrinsic-plus deformity)

- ▶ flexion at the MCP joints with extension of the IP joints and adduction of the thumb – an intrinsic-plus deformity.
- ▶ muscle scarring or shortening after trauma or infection.
- ▶ releasing the intrinsic muscles

Ischaemic contracture of the muscles

- ▶ shortening of the long flexors; the fingers are held in flexion and can be straightened only when the wrist is flexed.
- ▶ releasing the shortened muscles at their origin above the elbow,
- ▶ excising the dead muscles and restoring finger movement with tendon transfers.

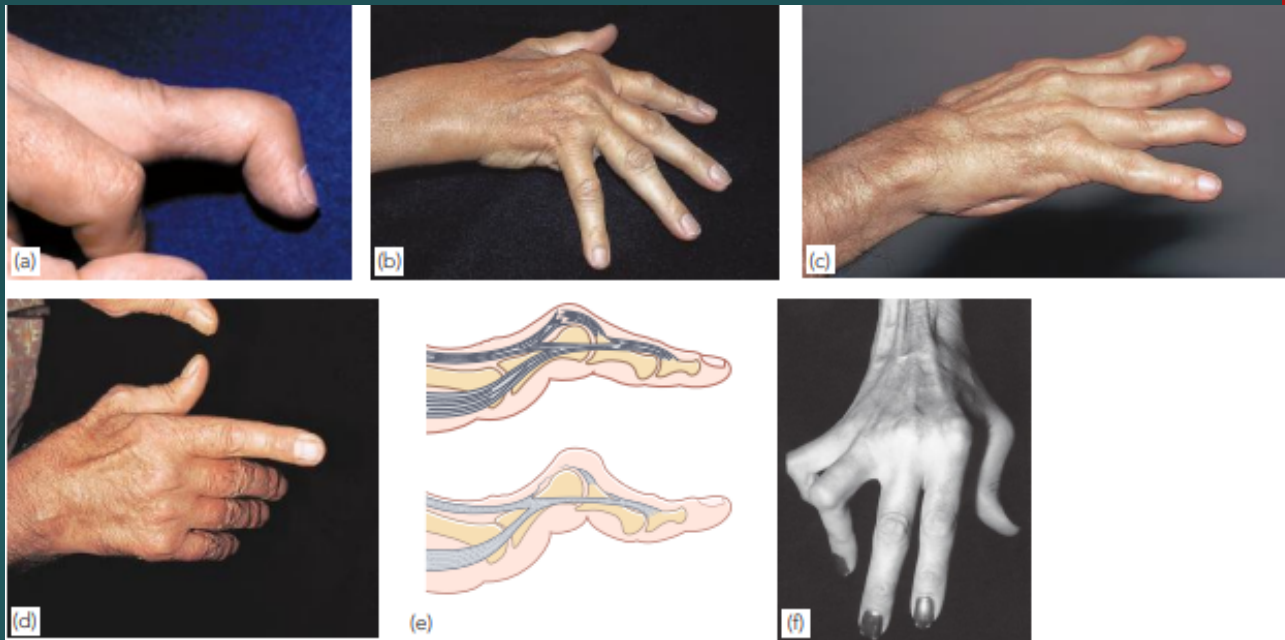
16.7 Contracture of the long flexors (a) When the wrist is extended, the fingers involuntarily curl into tight flexion. (b) When the wrist is flexed, tension on the long flexor muscles is relaxed and the fingers can uncurl to a certain extent.



'Mallet' finger

- ▶ The patient suddenly cannot straighten the terminal joint,
- ▶ passive movement is normal.
- ▶ injury at the attachment of the extensor tendon to the terminal phalanx.
- ▶ Acute injury treated by mallet splint.
- ▶ X-ray to rule out fracture.





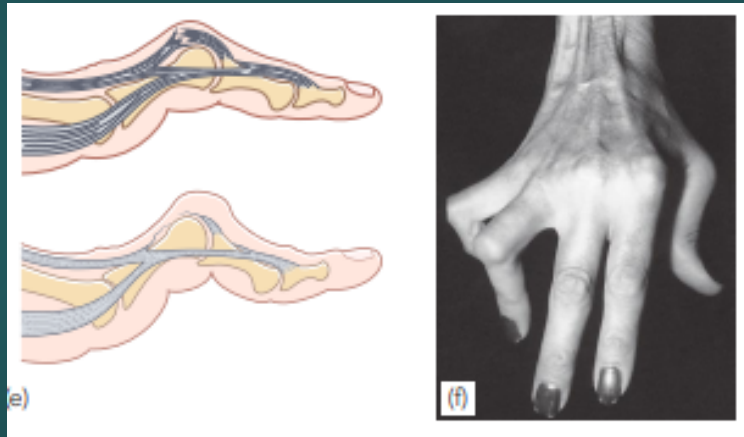
16.8 Deformities due to tendon lesions (a) Mallet finger. (b) Dropped fingers due to extensor tendon ruptures at the wrist. (c) Swan-neck deformities. (d) Rupture of extensor pollicis brevis. (e,f) Boutonnière deformities.

Ruptured extensor pollicis longus

- ▶ Post distal radius fracture, or rheumatoid arthritis.
- ▶ Direct repair is unsatisfactory and a tendon transfer, using the extensor indicis.

Boutonnière

- ▶ a flexion deformity of the PIP joint,
- ▶ Injury of central slip of the extensor tendon.
- ▶ trauma or in rheumatoid disease.



Swan-neck deformity

- ▶ reverse of boutonnière:
- ▶ the PIP joint is hyperextended and the DIP joint flexed.
- ▶ imbalance of extensor versus flexor action in the finger,
- ▶ rheumatoid arthritis



'trigger finger

- ▶ when the hand is clenched and then opened, the finger (or thumb) gets stuck in flexion; with a little more effort, it suddenly snaps into full extension.
- ▶ thickening of the fibrous tendon sheath:
- ▶ A tender nodule or thickened tendon can usually be felt at the distal palmar crease.
- ▶ DM.
- ▶ an injection of corticosteroid carefully placed at the entrance of the tendon sheath.surgical release.
- ▶ Infantile trigger thumb treated at age of 3years



Acute infections of the hand

- 1- Acute paronychia — infection under the nailfold.
- 2- Apical abscess — a small collection of pus under the end of a nail.
- 3- Intradermal abscess — a collection of pus on the palmar surface of the finger or hand, lying between the deep and superficial layers of the dermis, it may communicate with a second collection in the deep tissues — collar stud abscess .
- 4- Pulp space infection — the pulp space of the finger is divided by septa and becomes very tense and painful if sepsis occurs. The phalanx (usually terminal) may become secondarily infected and an X - ray is essential if infection is well – established.
- 5- Web space infections — infection occurs between the fingers and pus may point in the web.

- 6 Deep palmar space infection — suppuration may be localized to one or other of the anatomical palmar spaces

BOX 16.2 KANAHEL'S SIGNS OF FLEXOR SHEATH INFECTION

Flexed posture of digit
Tenderness along the course of the tendon
Pain on passive finger extension
Pain on active flexion

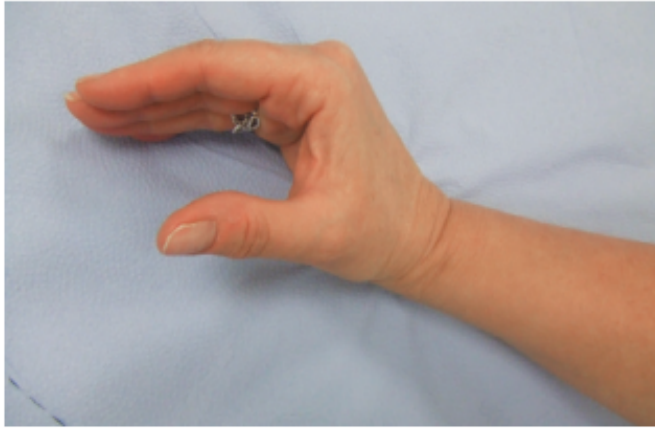


16.11 Types of hand infection (a) Acute nailfold infection (paronychia). (b) Chronic paronychia. (c) Flexor tenosynovitis of the middle finger following a cortisone injection. (d) Septic human bite resulting in acute infection of the fourth metacarpophalangeal joint.

Principles of treatment

Superficial hand infections are common; if their treatment is delayed or inadequate, infection may rapidly extend, with serious consequences. The essentials of treatment are:

- antibiotics
- rest, splintage and elevation
- drainage
- rehabilitation.



(a)



(b)

Figure 16.26 The position of safe immobilization The knuckle joints are 90° flexed, the finger joints extended and the thumb abducted. This is the position in which the ligaments are at their longest and splintage is least likely to result in stiffness.

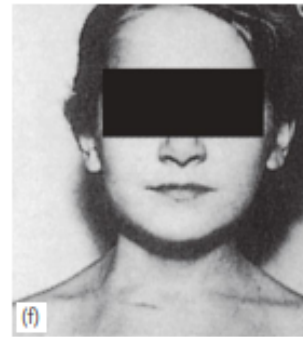
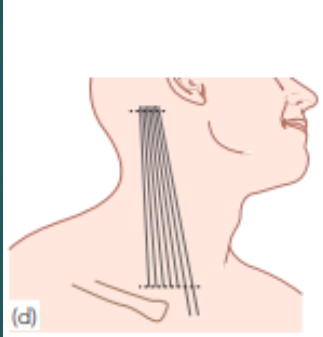
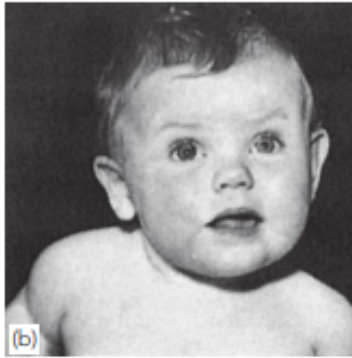
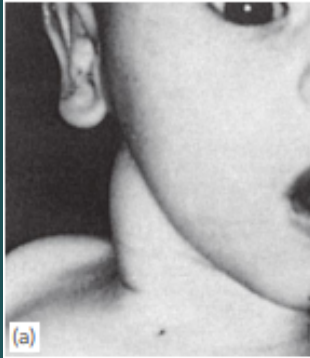
The image features a solid teal background. A horizontal red bar is positioned in the upper-middle section. A large, light blue circle is located on the right side, partially overlapping the red bar. In the top right corner, there is a small red vertical rectangle.

The neck

Torticollis ('wry neck', 'skew neck')

Infantile (congenital) torticollis

- ▶ The sternomastoid muscle on one side is fibrous and fails to elongate as the child grows.
- ▶ a well-defined lump is felt in the muscle.
- ▶ twisting the chin towards the opposite side.
- ▶ Secondary facial deformities may occur.
- ▶ gentle, daily manipulation of the neck.
- ▶ Surgical release.
- ▶ Post surgery orthosis and physiotherapy.
- ▶ Exclude DDH.



Secondary torticollis

- ▶ due to muscle spasm
- ▶ acute disc prolapse
- ▶ inflamed neck glands
- ▶ vertebral infection,
- ▶ injuries of the cervical spine or ocular disorders.
- ▶ Gastro oesophageal reflux

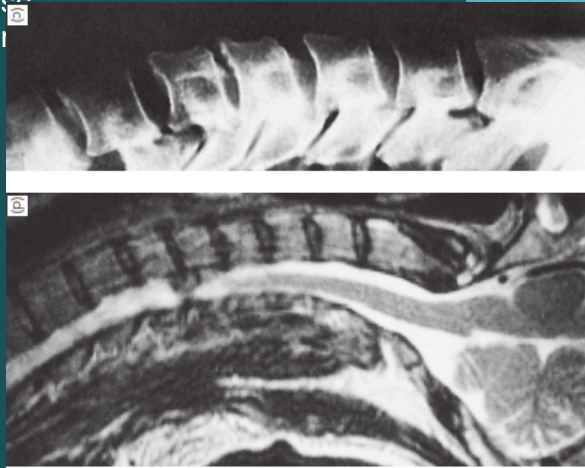


Acute Cervical disc prolapse

- ▶ local strain or injury, especially sudden unguarded flexion and rotation.
- ▶ a predisposing abnormality of the disc with increased nuclear tension.
- ▶ The disc protrusion may press on the posterior longitudinal ligament, causing neck pain .
- ▶ Radiculopathy to the scapular region , occiput.

Imaging

- ▶ X-rays may show narrowing of the disc space.
- ▶ MRI, which will show whether the disc protrusion is pressing on the adjacent nerve root



Differential diagnosis

- ▶ Acute soft-tissue strain:
- ▶ Neuralgic amyotrophy.
- ▶ Cervical spine infections.
- ▶ Cervical tumours.



Treatment

- ▶ Rest: a collar will prevent unguarded movement
- ▶ Reduce: traction may enlarge the disc space,
- ▶ Surgery by anterior approach.





The image features a solid teal background. A horizontal red bar is positioned across the middle, containing the text 'THE BACK' in white. To the right of the bar, a large light blue circle is partially visible. In the top right corner, there is a small red vertical rectangle.

THE BACK

Scoliosis

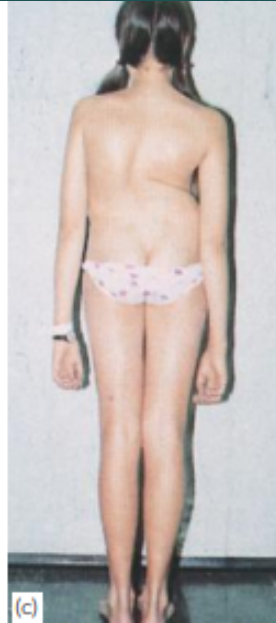
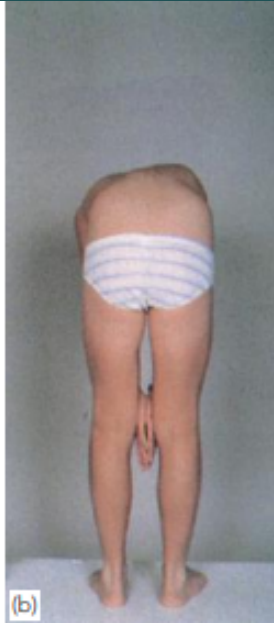
- ▶ an apparent lateral (sideways) curvature of the spine with rotation deformity with or without anterior posterior deformity.
- ▶ no obvious cause.
- ▶ congenital or osteopathic (due to bony anomalies), neuropathic, myopathic (associated with some muscle dystrophies) and a miscellaneous group of connective-tissue disorders.
- ▶ **Postural scoliosis**:-compensatory to some condition outside the spine, such as a short leg or a pelvic tilt due to contracture of the hip.disappears on sitting

Structural scoliosis

- ▶ a non-correctable deformity of the affected spinal segment, an essential component of which is vertebral rotation.
- ▶ The spinous processes swing round towards the concavity of the curve and the transverse processes on the convexity rotate posteriorly.
- ▶ In the thoracic region the ribs on the convex side stand out prominently, producing the rib hump.
- ▶ Secondary (compensatory) curves nearly always develop to counterbalance the primary deformity;
- ▶ the deformity is liable to increase throughout the growth period

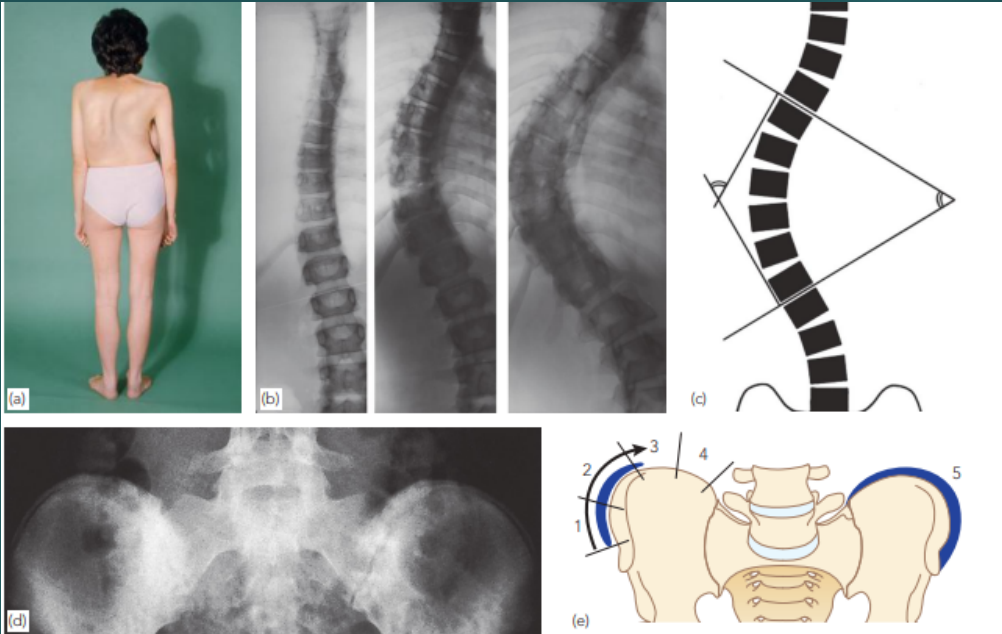
Clinical features

- ▶ Deformity a rib hump in thoracic curves, and asymmetrical prominence of one hip in thoracolumbar curves.
- ▶ . Pain is a rare complaint and should alert the clinician to the possibility of a neural tumour .
- ▶ A family history of scoliosis .
- ▶ Spinal mobility should be assessed and the effect of lateral bending.
- ▶ Neurological examination.
- ▶ assessment of cardiopulmonary function.
- ▶ Skin pigmentation and congenital anomalies such as sacral dimples or hair tufts are sought



Imaging

- ▶ Full-length posteroanterior (PA) and lateral x-rays of the spine and iliac crests must be taken standing.
- ▶ Lateral bending views are taken to assess the degree of curve correctability.
- ▶ (Cobb's angle)
- ▶ Right thoracic curves are the commonest
- ▶ girls in adolescent
- ▶ (Risser's sign of skeletal maturity).
- ▶ CT and MRI may be necessary to define a vertebral abnormality or cord compression.



18.8 Adolescent idiopathic scoliosis (a) Typical thoracic deformity. (b) Serial x-rays show how this curve increased over a period of 4 years. (c) The angle of curvature is measured on the x-ray by Cobb's method: lines projected from the top of the uppermost and the bottom of the lowermost vertebral bodies in the primary curve define *Cobb's angle*. An AP view of the pelvis is needed to assess *Risser's sign* (d,e). The iliac apophyses normally ossify progressively from lateral to medial; when fusion is complete, we know that spinal maturity has been reached and further increase in the angle of curvature is negligible.