......MAM AROOBA SAJJAD....***....***

Midterm Lab assigemnment.

- **Fall 2020**
- **Submitted by..... AROOBA SAJJAD.**
- **ID Number :17299**
- **Topic : Write bfrief note on the joints of upperlimbs.**
- **Deperatment ..Bs anesthesia**

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1

...The Acromioclavicular Joint...

- *The acromioclavicular joint is plane type synovial joint .it is located where the lateral end of the clavicale articulate withe the acromion of the*

scapula the joint can be palpated during a shoulder examination; 2-3cm medially frome the 'tip' of the shoulder (formed by the end of the acromion)

- *In this artical we shall look at the anatomy of the acromioclavicular joint -its articulation ,ligamaents, neuerovascular supply ,and any clinical correelations.*

Structures of the acromioclavicular joint

.. *Articulating surfaces.*

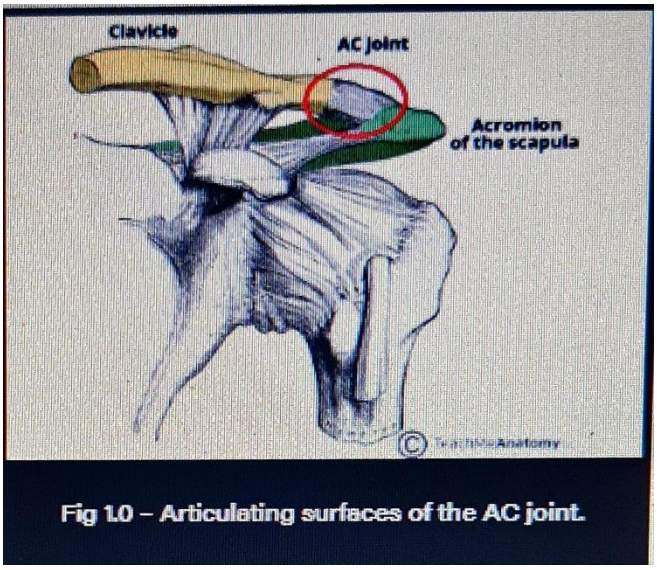


Fig 1.0 – Articulating surfaces of the AC joint.

**The acromioclavicular joint consists of an articulation between the lateral end of the clavical wnd the acromion of the scapula.its has two atypical features;*

- *The articular surfaces of the joint are the lined with **Fibrocartilage** .(as opposed to hyaline cartilages)*

- *The joint cavity is partially divided by an **articular disc** -a wedge of fibrocartillage suspended from the upper part of the capsule.*

<u>...Joint capsule</u>

- *The joint consists of a loose **fibrous** layer which enclose the two articular surfaces. Its also gives rise to the **articular disc**. The posterior aspect of the joint capsule is reinforced by firbres from the trapezius muscle.*
-
    - *As would be expected of a synovial joint ,joint capsule is lined internally by a **synovial membrane .**this secreates synovial fluid into the cavity of the joint.*

...Ligaments ...

- *There are three main liagaments that strenghthen the acromioclacular joint. They can be divided into intrinsic and extrinsic ligaments:*
- ***Intinsic;***
- *aCromioclavvicular ligament -runs horizentallly from the acromion to the lateral clavical .its covers the joint capsule , reinforceing its superior aspect.*

- ***Extrinsic:***
- *Conoid ligament – runs vertically form the coracoid process of the*

scupual to the conoid tubercle of the clavicale

- *tRapeziod ligament -runs from the corcacoid process of the scpula to the trapezoid line of the clavicale.*
- *Collectively ,the conoid and trapezoid ligament are the know as the* ***coracoclavicular ligament*** *.its is a very strong structure ,effectively suspending the weight of the upper limb form the clavicale.*

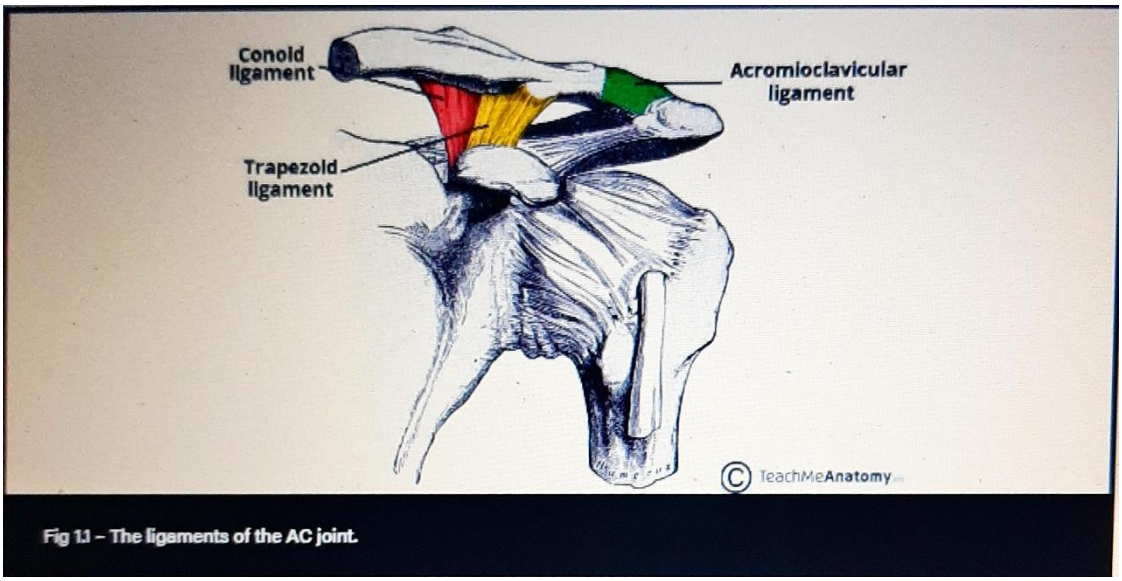
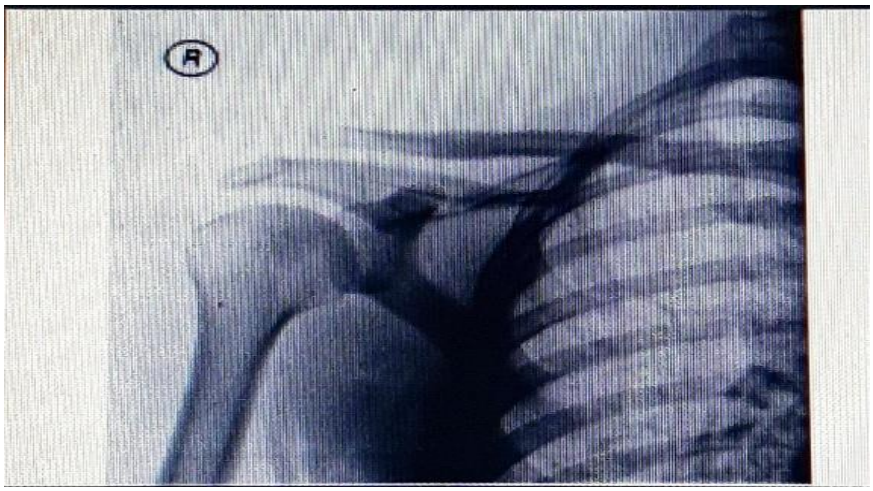


Fig 1.1 – The ligaments of the AC joint.

CLINCAL RELEVENCE—

- ***ACROMIOCLAVICULAR DISLOSCATION.***
- *Acromioclavicular joint dislocation (also know as a separated shoulder)occure when the two articulating surface of the joint are separated .it is associated with joint soft tissue damage*

- *It commonly occurs from a direct blow to the joint ,or a fall an outstrtched hand .*
- *tHe injury is more serious if ligamental rupture occure (**acromioclavicualr** or **coracoclavicuoar)**...if the coracoclavicular ligament is torn , weight of the upper limb is not*



supported ,and the shoulder moves inferiorly .this increases the prominece of the clivical.

- *Management of Ac joint dislocation is dependent on injury severity and impact on of life .the treatment option range from ice and rest to* ***ligament reconstructiin surgery.***

- ***NOTE..:****this injury is not be confuised with shoulder dislocation – an injury affecting the glenohumeral joint ...*

2..

<u>The sternoclavicular joint..</u>

- *tHe sternoclavicular joint is a synovial joint between the **clavical** and the manubrium of the **sternum.***
- *Its the noly attachment of the **uppper limb** to the axial skeleton.despite its strength its a very mobile joint and can function more like a ball-and-socket type joint.*
- *In this artical we will look at the anatomy of the **sternoclvicular joint.**- the joint sturture ,neurovascular supply,and its clinical consedration.*

JOINT STRUSTURE .

- ***Articulating Surfaces.***
- *tHe sternoclavicular joint consists of the **sternal end** of the clavical ,the manubrium of the sternum,and part*

the 1st costal cartillege .the articulate surfaces are covered with ***fibrocartillage*** *(as opposed to hyaline cartilage ,persent inthe majorty of the synovial joint)the joint is separated into two compartment by a fibrocartilleginous* ***articualte disc.***

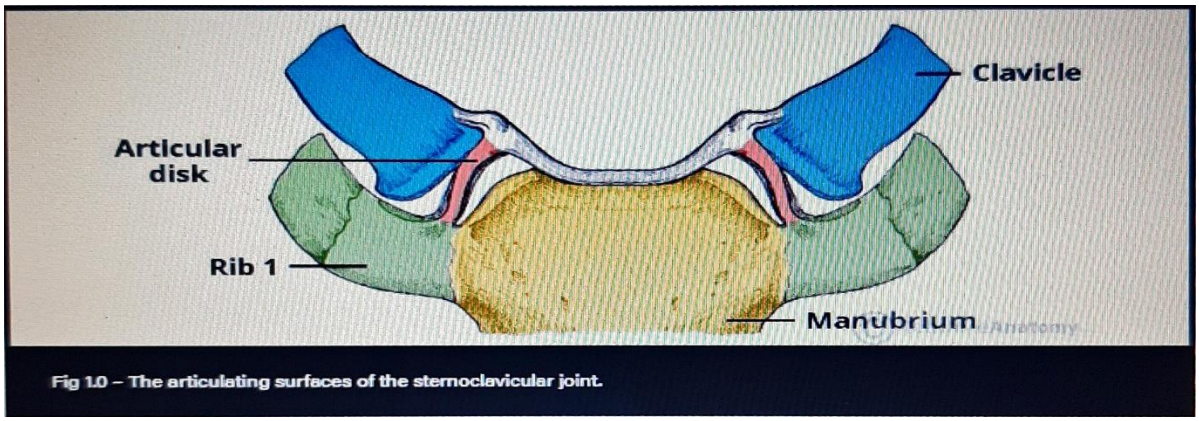


Fig 1.0 – The articulating surfaces of the sternoclavicular joint.

Joint capsule ...

- *The joint cpsule consists of a fibrous outer layer and inner synovial*

memberne .the fabrous layer extend from the epiphysis of the sternal end of the clavical ,to the borders of the articulate surfaces and the articualte disc.A ***synovial membrane*** *lines the inner aurface and produces synovial fluid to reduce to reduce friction between the articulateing structures.*

- ***Ligaments.***
- *The ligament of the of the sternoclavicular joint provide much of its stabillity.there are four major ligament.*
- ***Sternoclvicular ligament.-****(anterior and posterior)-these strength the joint capsule* ***anteriorly and posteriorly .***

- ***Interclavicular ligament..****this spans the gap between the sternal ends of each calvical and reinforces the joint capsule* ***superiorly.***
- ***cOsteclavicular ligament ..-****two parts of this ligament (often separated by a bursa) bind at the* ***1st rib and cartilege*** *inferioly and to the anterior and posterior border of the* ***calvicale*** *superiorty .it is a very strong ligament and is the main stablising force for the joint ,resisting elevation of the pectoral gridle.*

- *The sternoclavicular and interclavicular ligaments can be considerd to be thicknings of the joint capsule ..*

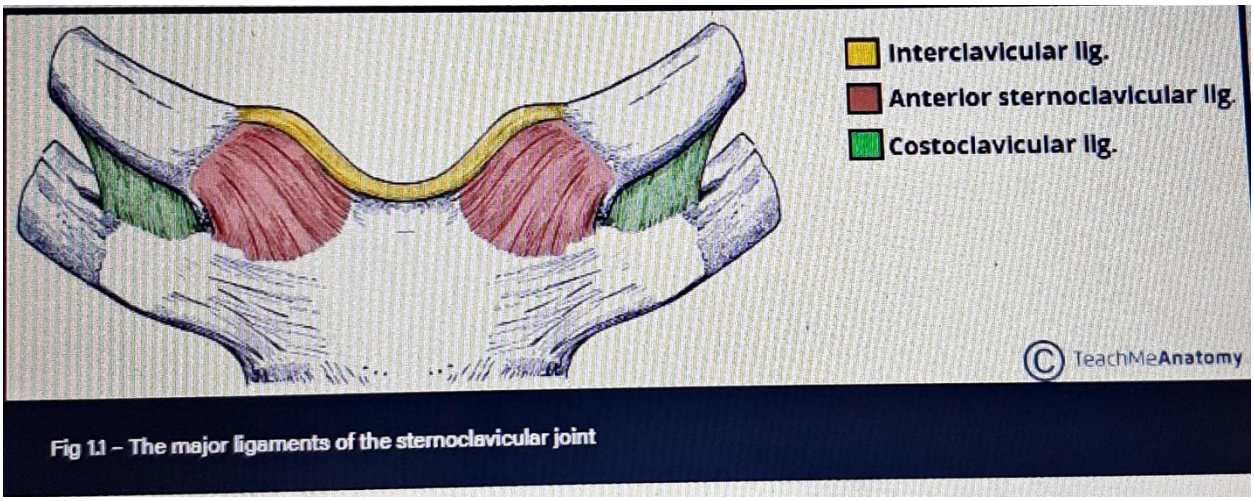


Fig 1.1 – The major ligaments of the sternoclavicular joint

- ***Movements..***
- *The sternoclavicualr joint has a large dgree of mobiltiy.there are several movement that require joint involement.*

- ***Elevation.****of the shoulder -shrugging the shoulders or abducting the arm over 90°*
- ***Depression..****of the shoulder -dropping shoulder or extending the arm at the shoulder behainde the body.*
- ***Protrection*** *of the shoulder -moving the shoulder gridle anteriorly*
- ***Retraction.****of the shoulder -moving the shoulder gridle posteriorly*
- ***Rotation—****when the arm is raised over the head by flexion the clavicale rotates passively as the scapula rotates .this is tranmitted to the clavical by the* ***coracolavicular ligaments.***

- *Thecostoclavicular ligament acts a pivot for movements of the clavicle .you can feel this if u palpate the steranl end of your clvicale and shurg your shoulders.you should feel the end moving inferiorly.*

Mobility and stabillity ..

The sternoclavicular joint is request to acckmmodate the movements of the uppper limb,and thus a high degree of mobiltiy. However ,it also requires much stabillty ,as it is the only connection between the upper limmb and axial skeleton and its stabillity .

Mobility.

Type of joint -*being a saddle joint it can move in two axes .*

Articular disc -this allows the claical and the manubrium to slide over each other more freely ,allowing for the rotaion and movement in a third axis.

Stability.

- *Storng joint capsule*
- *Strong ligament- particualry the costoclavicualr ligament,which transfers streess from the clavicald to the manubrium (via the costal cortilage.*

- ***CLINICAL RELVENCE :***

- ***Dislocation of the sternoclavicular joint.***

- *A dislocation of the sternoclavicular joint is quite rare and requires significent force. The costoclavicular ligament and the articular disc are higly effective at absorbing and trnansmitting forces away from the joint into the sternum.*

There are two major types of dislocation.

- ***Anterior dislocations*** *are the most common and can happen following a blow to the anterior shoulder which rotates the shoulder backward.*

- ***Posterior dislocation*** *normally result from a froce driving the shoulder forwards or from direct impact to the joint .*

In *younger people ,the epiphysesl growth plate of the sternal end of the clavical has not fully closed .in this population ,the dislocation is usually accompaniend by a fracture through the palte.*

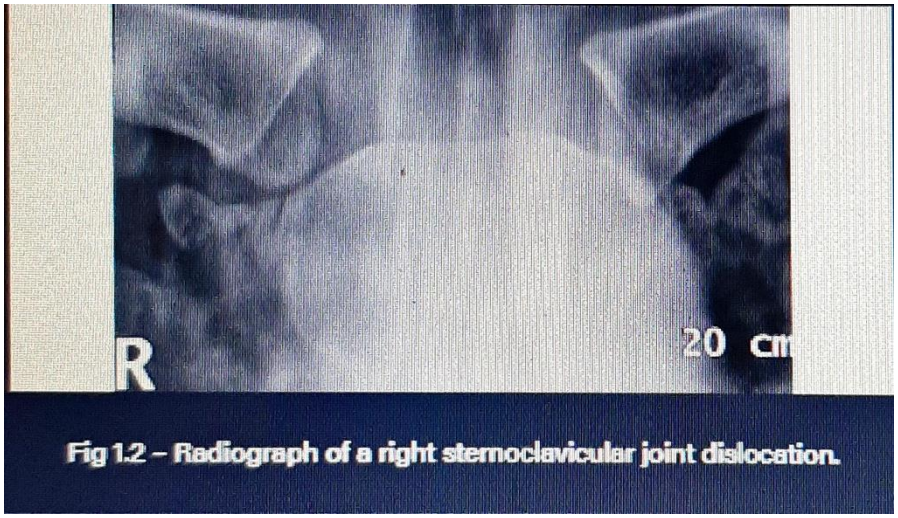


Fig 1.2 – Radiograph of a right sternoclavicular joint dislocation.

3 …

THE SHOULDER JOINT.

- *The shoulder joint (glenohumeral joint is ball and socket joint between the **scapula** and the **humerus.**it is the major joint connecting the upper limb to the trunk.*
- *It is one of the most mobile joint in the human body ,at the cost of joint stabillty .in this artical .we shall look at the anatomy of the shoulder joint and its important clinical correlation.*
  - ***STRUCTURES OF THE SHOULDER JOINT.***
  - ***Articulating surfaces..***

- *The shoulder joint is formed by the articulation of the **head** of the humerys with the **glenoid cavity** (or fossa) of the scapula .this gives rise to the alternate name for the shoulder joint -the glenohumeral joint .*
- *Like most synovial joint the articulating surface are coverd with **hyaline cartillage .**the head of the humerus is much larger than the glenoid fossa,fossa give the joint a wide range of the movement at the cost of inherent instabiltiy.to reduce the disproportion in surface,the glenoid fossa is deepend by a*

fibrocartilage rim called the ***glenoid labrum***

Joint capsule and bursae..

- *tHe* ***joint capsule*** *is a fabrous sheath which enclose the struture of the joint .*
- *It extends from the* ***anatomical neck*** *of the humrus to the border or 'rim' of the glenoid fossa . The joint capsule is lax, permitting greater mobility (particularly abduction.)*
- *The* ***synovial membrane*** *line the innersurface of the joint capsule and produce synovial*

fluid to ruduce friction between the articular surfaces.

- *tO reduce friction in the shoulder joint several **synovail bursae** are persent .a bursda is a synovial fluid filled sac which acts as a cushion between tendonds and the other joint structure .*
- *The bursar that are important clinically are*
- ***Subacromial -**located deepto the deltiod and acromiin,and superficial to the supraspinatus tendon and joint capsule the sub acromial bursea reduces.friction beneth the*

deltoid and, promoting free motion of the rotator cuff tendon ,subaromial bursitis(i.e inflammation of the bursa)can be A cause of the shoulder pain.

- ***Subcapular -****located between the subscspularis rendond and the sacpula.it the reduces wear and tear on the tendon during movement at the shoulder joint.*

- ***The**re are other minnor bursae present between the tendons of the muscles of the around the joint but this beyound the scope of the this articale..*

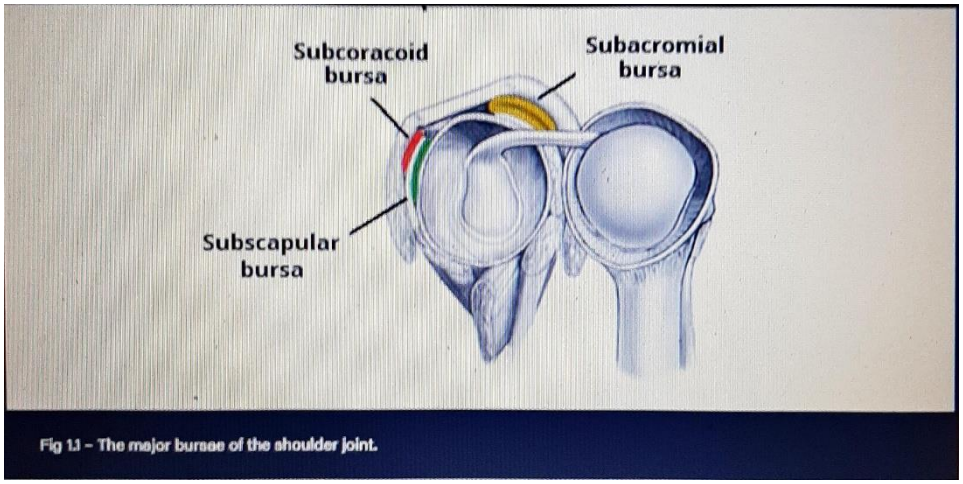


Fig 1.1 – The major bursae of the shoulder joint.

Ligaments..

- *In the shoulder joint the ligament play a key role in stabliising the bony structures.*

- ***Glenohumeral ligaments..****(superior ,middle, and inferior) -the joint capsule is formed by this group of ligament connecting the humerus to the glenoid fossa .they are the main source of the stabilltiy for the shoulder ,holding it in place and preventing it form dislocation anyeriory.they act to stabilise the anterior aspect of the joint.*
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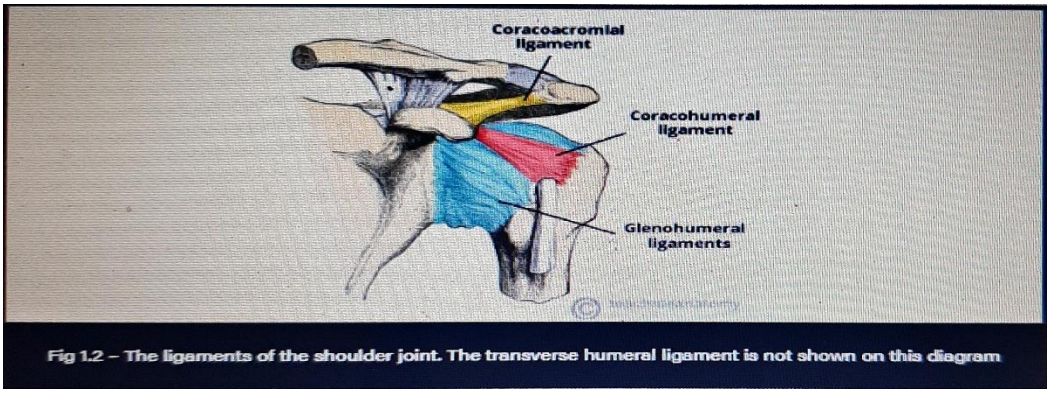

Fig 1.2 – The ligaments of the shoulder joint. The transverse humeral ligament is not shown on this diagram

Coracohumaral ligament..—*attaches the base of the corcoiad process to the greter tubercle of the humerus .it supports the superior part of the joint capsule.*

Tarnsverse humeral ligament..—*spans the distance between the two tubercles of the humerus .it holds the tendon of the long of the biceps in the intertubercular groove.;;*

Caraco-clavicular ligament..-*composed of the trapeziod and the conoiad lagament and runs from the clavicale to the corcoiad process of the scapuala. They work alonggside the acromioclavvular ligament to maintain the alignnment of the clavical in relation*

to the scapula .they have significcant strenghth but large forces .(eg .after a high energy fall) can repture these ligament as part of on an acromio-clavicular joint (ACJ) injury .in severe ACJ, the carco-calvicular ligament may require surgical repair .

- *The other major ligament is the **coracoacrmial ligament .**running between the acromail and corcoiad process of the scapula it forms the **corco-ligament arch.** This structure overlies the shoulder joint , preventing superior dispalcement of the humeral head.*

Movements..

As *a ball and socket synovial joint , there is a wide range of the movement permitted :*

- ***Flexion (upper limb forward in sagitall plane .)-****pectoralis major ,anterior anterior deltoid and corcobrachiallis.biceps brachii weakly assists in forward the flexion.*
- ***Extenion (upper limb backwards in segittal plane) -****posterior deltoid , latissimus dorsi and teres major .*
- ***Abduction (upper limb away from midline in coronal plane):***
- *The first 0—15 degree of the abduction is produced by the supraspinatus.*

- *The middle fibres of the deltoid are resposible for the next 15—90 degrees.*
- *Past 90 degrees the scapula need to be rotated to achive abduction -that is carried out by the trapeziod and serratus aneterior ..*
- ***Abducation (upper limb midline in coronal plane)-****pectorallis major latissimus dorsi and teres major*
- ***Internal rotation (rotation toward the midline ,so that the thumb is pointing medially.)—subscap****ualaris ,pectoralaris major lattissimus dorsi, teres and anterior deltoid.*
- ***Extarnal rotaion(rotation away from the midline so that the thumb is***

pointing laterally)*-infraspintous and teres minor.*

4..

THE ELBOW JOINT...

- *The elbow is the joint connecting the upper arm to the foreawrm.it js classed as a hinge-types synvial joint .*
- *In this artical we shall look at the anatomy of the elbow joint ;its articulating surface movements stabiltiy ,and the clincal relevence.*
- ***STRUCTURE of the elbow joint***
- *.Articulating surface..*
- *It consists of the two separate articulataion.*

- *Trochlear notch of the **ulna** and the teochlea of the **humerus.***
- *Head of the **radius** and the capitulum of the **humerus.***

Note.

- *The **proximal radioulanr joint** is found within same joint capsule of the elbow , but most resources consider it as a separate articulation*
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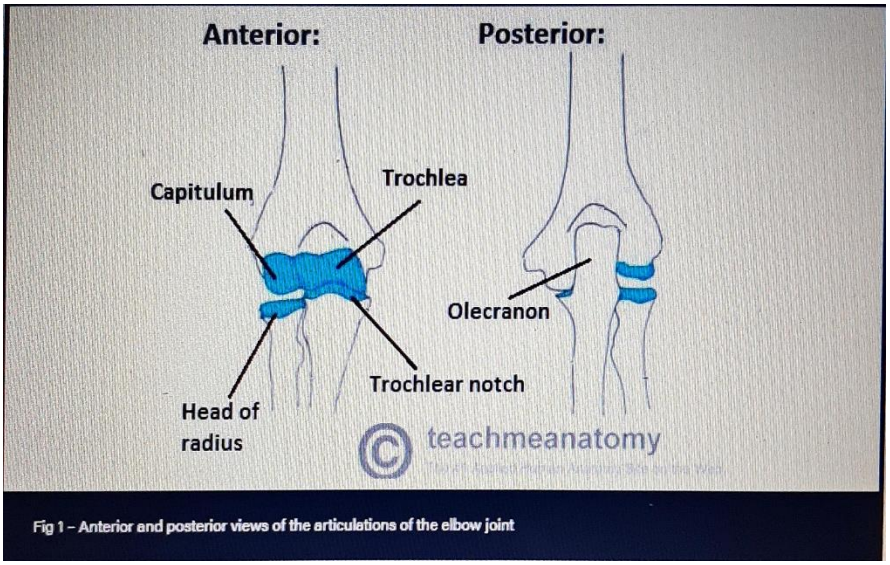


Fig 1 – Anterior and posterior views of the articulations of the elbow joint

Joint capsule and bursae..

- *Like all synovial joint ,the elbow has a capsule enclosing the joint .this in itself is strong and fibrous , strngthening the joint . The joint capsule is thickened medially and latearlly to form collatral ligaments.which stabilis the flexing and extending motion of the arm.*
- *A bursa is a membranous sac filled with synovial fluid .it acts as a cushion to reduce friction betwen the moving parts of a joint ,limiting degeneration damage .there are many bursae in the elbow but only a few have clinical importance.*

- ***Intratendinous*** ***--****located with in the tendon of the triceps brachii.*
- ***Subtendinous –****between the olecrelanon and the tendon of the of the tricep brachii, reducing friction between the two structure during extension and flexion of the arm .*
- ***Subcutaneous..(olecranon)bursa.—*** *between the olecrananon and the overlying connective tissue (implicated in olecranon bursitis.)*

Ligaments.

- ***The*** *joint capsule of the elbow is strngthened by ligament medially and letarally.*
- *The* ***radial collatrall*** *ligament is found in the latral side of the joint extending*

*from the **lateral epicondyle ,**and blending with the annular ligament of the radius (a ligament from the proxiamal radioulanlar joint..)*

- *The **unla collateral** ligament origninate from the **medial epicondyle** and attaches to the coronoid process and olecranon of the ulna.*
-

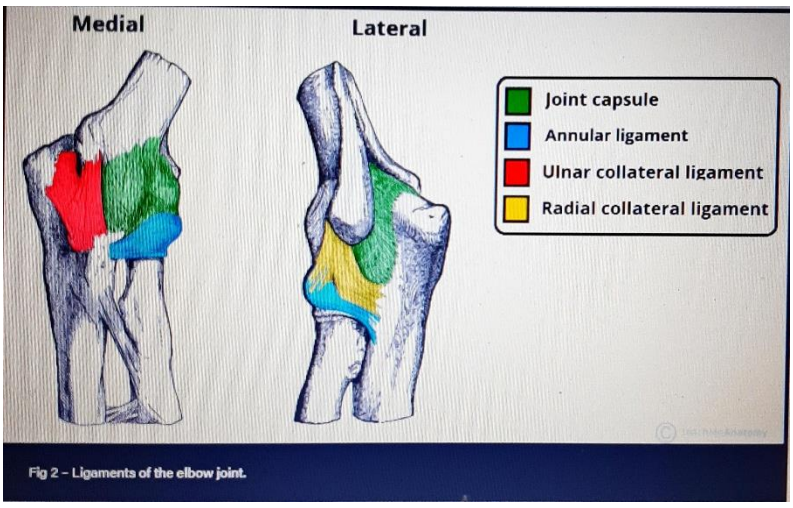


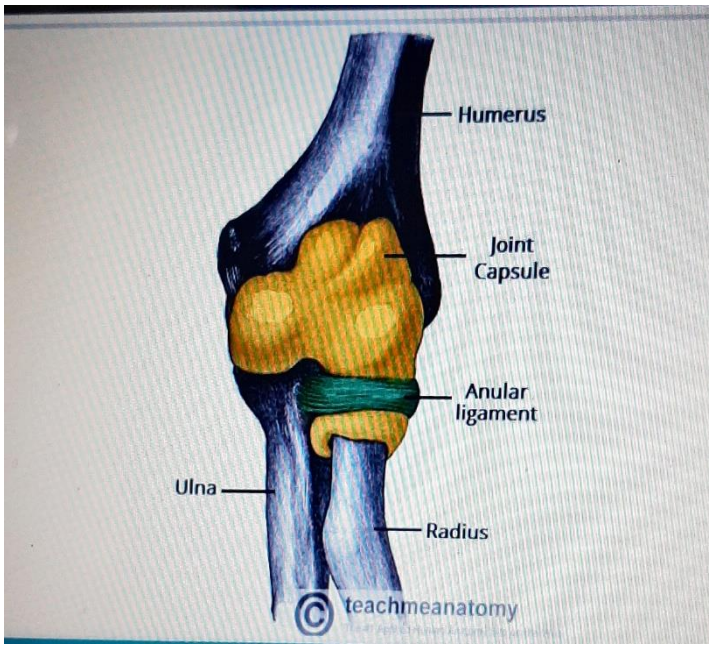
Fig 2 – Ligaments of the elbow joint.

5.

..*The radioulanar joints...*

- ***tHe*** *radioulnar joints are two locations in which the* ***radius*** *and* ***ulna*** *articulate in the forearm .*
- ***Proximal radiioulnar joint –*** *located near the* ***wrist.*** *It is an articulation between the head of the radius and the radial notch of the ulna.*
- ***Distal radioulnar joint .—****located near the* ***wrist****.it is an articulation between the ulnar notch of the* ***radius*** *and the ulnar head .*
- ***Both*** *of the these joint are classified as pivot joint,resposibale for* ***pronation****. And* ***supination.****of the forearm.*

- *In this artical ,we shall look the anatomy and clinical correlation of these joints.*
- *DAIGRAM...*



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- ***<u>PROXIMAL RADIOULNAR JOINT.</u>***
- *The proximal radioulnar joint is located is immediately distal to the* ***elbow joint*** *and is enclosed with in the same* ***articulate capsule .****it is*

formed by an articulation between the head of the radius and the notch of the ulna .

- *The radial head is held in place by the **annular radial ligament** ,which form a 'collar'around the joint .the annular radial ligament is lined with a synovial membrane reducing friction during movement .*
- *mOvement is produced by the head head of the radius rotation within the annular ligament .*
- *There are two movements possibal at this joint ;pronation and supination .*
- ***Pronation:;** Produced by the pronator quadratus and pronator teres .*

- ***Supination;Pr****oduced by the supinator and biceps brachii.*

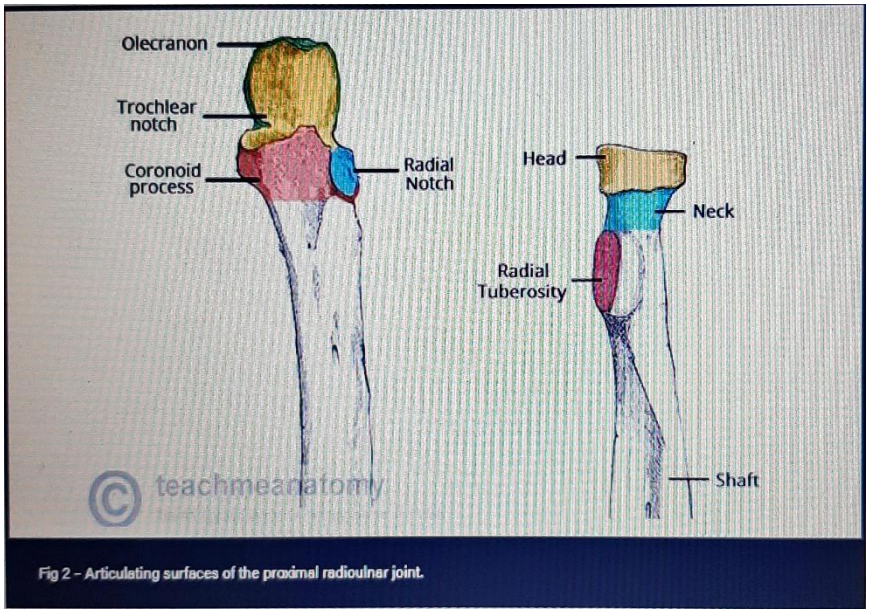

Fig 2 – Articulating surfaces of the proximal radioulnar joint.

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Distal radioulnar joint..

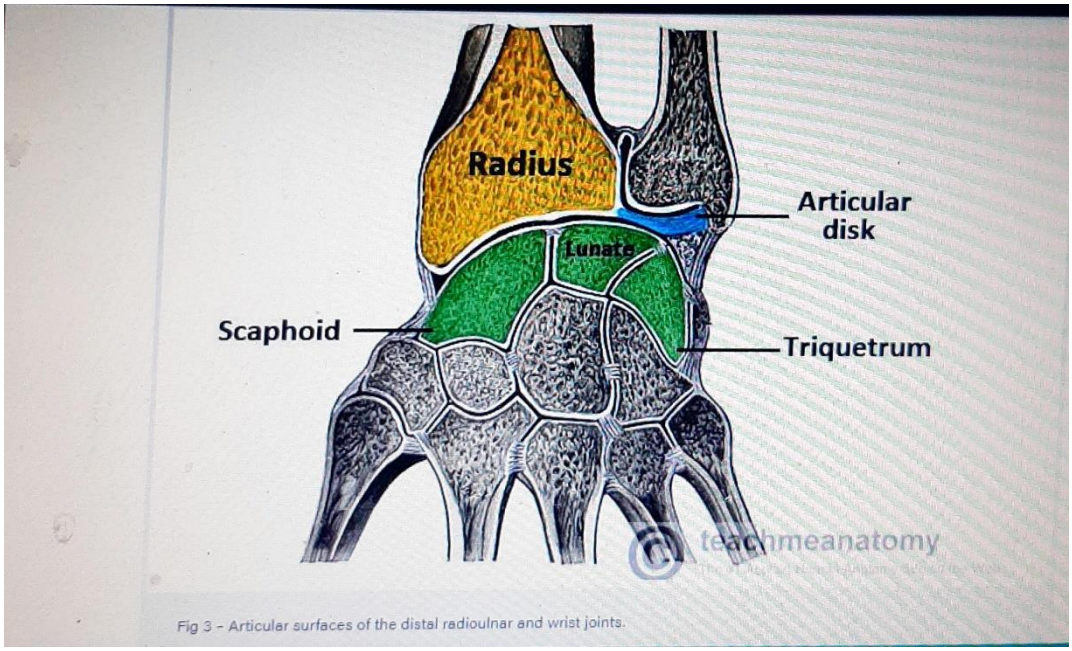
This distal radioulnar joint is located just proximally to the ***wrist joint.****it is an articulation between the ulnar notch of the radius , and the ulna r head.*

- *In addition to anterior and posterior ligaments strengthening the joint*

,there is also a fibrocartilaginous ligament present ,called the ***articualr disk.*** *It serves two function .*

- *Binds the radius and ulna togerther and hold them together during movement at the joint*
- *Separate the distal radioulnar joint from the wrist joint*
- *Like the proximal radioulnar joint this is a* ***pivot*** *joint,allowing for the pronation and supination ..the ulnar notch of the radius slide anteriory over the head of the ulanr during such movement.*

- ***Pronation; Pro****duced by the pronator quadratus and pronator teres .*
- ***Supination; P****roduced by the supinator and biceps barchiii.*



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6...

THE WRIST JOINT..

- *The wrist joint (also know as the radiocarpal joint)is a synovial joint in the upper lombs ,marking the area of the transition between the forearm and the head .*
- *In this artical we shall look at the structure of the wrist joint the movement of the joint ,and the relevent clinical syndromes.*
- ***Structure of the wrist joint.***
- ***Articulating surfaces..***
- ***Distally****—the proximal row of thr carpel bones (except the pisiform .)*
- ***Proximally..****the distal end of the radius and the articular disk (see below.)*

- ***tHe ulna is not a part of the wrist joint –****its articulate with the radius ,just proxiaml to the wrist joint at distal radioulanr joint it is prevented from articulating with the carpal bones by a fibrocartilaginous liagament called the articualt disk which lies over the superior surface of the unla ..*
- ***To****gether the carpal bones form a* ***convex*** *surface ,which articulate with*

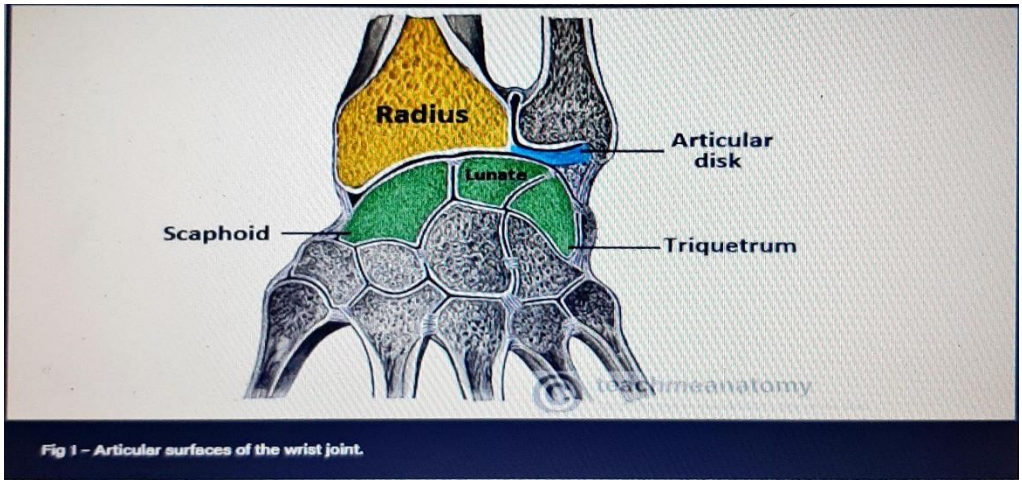

Fig 1 – Articular surfaces of the wrist joint.

*the **cancave** .surface of the radius and articualr disk.*

-

Joint capsule ..

- *Like any synovial joint the capsyle is dual layered the faibrous outer layer attaches to the radius ,ulna and the proxiamal row of the carpal bones .the internal layer is comprised of a synovial membrane secreting synvial fluid which lubricates the joint .*

Ligaments.....

There are four liagament of note in the wrist joint one for each side of the joint

- ***Palmar radiocarpal..—its** is found on the palmar (anterior) side of the*

hand it passes from the radius to both rows of carpal bones its function aprt from increaseing stabillty is to ensure that the hand follows the foream during supination

- ***Dorsal radiocarpal. -****It is found on the dorsum (posterior) side of the hand.it passes form the radius to both rows of carpal bones .it contribute to the stabiltily of the wrist ,but also ensures that the hand follows the forearm during pronation.*
- ***Ulnar collatral –****Runs from the ulnar styloid process to the triquertrum and pisiform work in union with the other collatral laigment to prevent exessive lateral joint dispalcement ..*

- ***Radial collateral ---R****uns form the radial styloid process to the scaphiod and tarezium .work in union with the other collateral ligament to prevent*

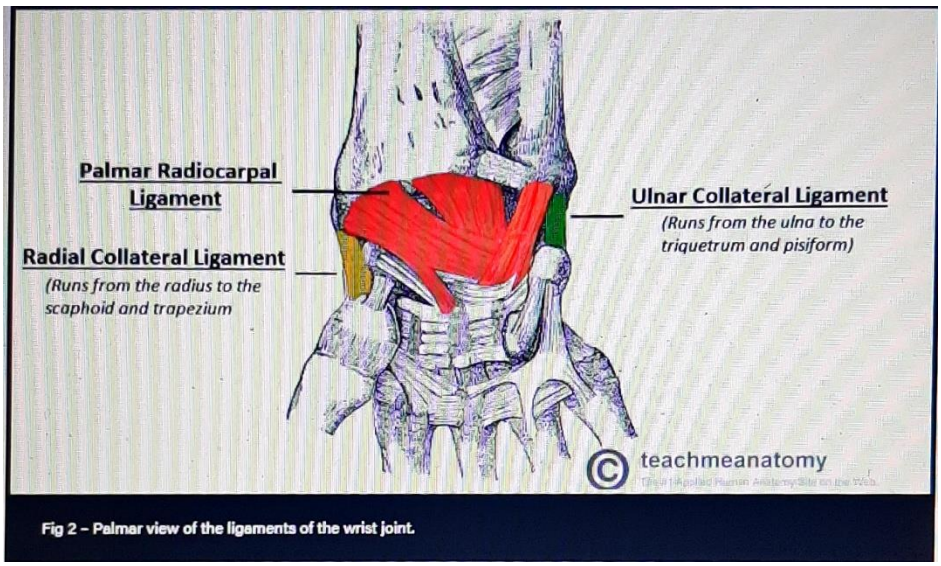

Fig 2 – Palmar view of the ligaments of the wrist joint.

to prevent excesssive lateral joint displacement..

……. The ends....***..***