

# JOINTS OF UPPER LIMB

DESCRIBE THE SHOULDER JOINT UNDER THE FOLLOWING HEADINGS (LE)

**Articular ends, Capsule and ligaments, Relations, Movements and muscles producing them, Blood supply and nerve supply, Add a note on applied anatomy.**

Shoulder joint is a ball and socket variety of synovial joint.

## **Articular ends**

The joint is formed by the articulation of scapula and the head of humerus. Structurally it is a weak joint because the glenoid cavity is too small and shallow to hold the head of humerus in place.

The joint permits great mobility.

## **Capsule and ligaments**

Fibrous capsule

Gleno - humeral ligaments

Glenoidal labrum

Coraco humeral ligament

Transverse humeral ligament

## **Fibrous capsule -**

It is loose and permits free movements.

It is least supported inferiorly.

### Attachments of the capsule -

Medially - scapula beyond the supraglenoid tubercle and margins of the glenoidal labrum

Laterally - anatomical neck of humerus

Inferiorly - to the surgical neck of humerus.

Superiorly - it is deficient for the passage of tendon of long head of biceps.

## **Gleno - humeral ligaments**

The fibrous capsule is reinforced anteriorly by bands called superior, middle and inferior Gleno - humeral ligaments.

## **Glenoidal labrum**

It is a fibrocartilagenous rim which covers the margins of glenoid cavity.

## **Coraco humeral ligament**

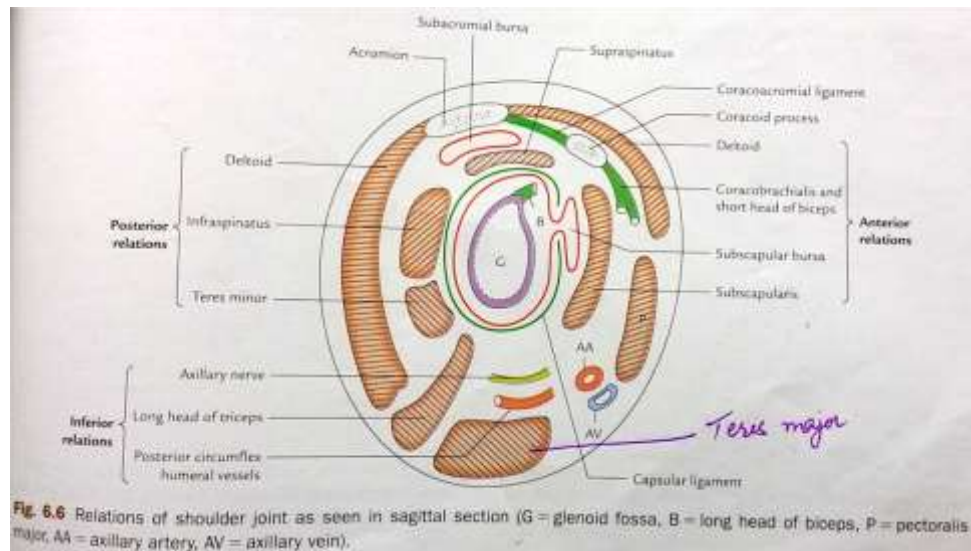
Extends from the root of coracoid process to the neck of humerus.

It gives strength to the capsule.

## **Transverse humeral ligament**

Bridges the upper part of bicipital groove of humerus.

The tendon of long head of biceps passes deep to the ligament  
**Relations**



Superiorly

Deltoid, Supraspinatus, Subacromial bursa, Coracoacromial arch

Inferiorly

Long head of triceps brachii

Posteriorly

Infraspinatus, teres minor and deltoid

With in the joint

The tendon of long head of biceps brachii.

### Blood supply

#### Arterial supply

Anterior and posterior circumflex humeral artery

Suprascapular artery

subscapular artery

#### Venous drainage

Anterior and posterior circumflex humeral veins

Suprascapular vein

subscapular vein

### Nerve supply

axillary nerve

musculocutaneous nerve

suprascapular nerve

### Movements of shoulder joint

The movements are considered in relation to scapula rather than in relation to sagittal and coronal planes.

- a) Flexion and extension
- b) Abduction and adduction
- c) Medial and lateral rotation
- d) Circumduction

Muscles involved in movements of shoulder joint are

MOVEMENTS	MAIN MUSCLES	ACCESSORY MUSCLES
Flexion	Pectoralis major Deltoid	Biceps brachii Coracobrachialis Pectoralis major
Extension	Deltoid Latissimus dorsi	Teres major Long head of triceps
Abduction	Supraspinatus 0 - 15° Deltoid 15° - 90° Serratus anterior 90°-180° Trapezius 90°-180°	-
Adduction	Pectoralis major Latissimus dorsi Short head of biceps brachii long head of triceps brachii	Teres major coracobrachialis
Medial rotation	Pectoralis major Anterior fibres of deltoid Latissimus dorsi Teres major	subscapularis
Lateral rotation	Deltoid Infraspinatus Teres minor	-

### Applied anatomy

#### 1) Dislocation-

Shoulder joint is more prone for dislocation than any other joint in the body.

This is due to laxity of the capsule and disproportionate size of articular surfaces.

Dislocation occurs inferiorly often injuring the axillary nerve.

The dislocation is usually caused by excessive extension and lateral rotation of humerus.

### Frozen shoulder

Occurs due to shrinkage of joint capsule.

Patient complains of pain and stiffness in the joint.

### **ABDUCTION AND ADDUCTION MOVEMENT AT SHOULDER JOINT (SE)**

Abduction and adduction occur at right angles to the plane of flexion and extension

Muscles bringing about abduction and adduction at the shoulder joint are

<b>movements</b>	<b>Main muscles</b>	<b>Accessory muscles</b>
<b>Adduction</b>	Pectoralis major Latissimus dorsi Short head of biceps brachii Long head of triceps brachii	Teres major coracobrachialis
<b>Abduction</b>	Supraspinatus Deltoid Serratus anterior Upper and lower fibres of trapezius	-

### **Abduction of shoulder**

Abduction occurs at  $180^{\circ}$ .

The movements occur partly at the shoulder joint and partly at the shoulder girdle. The humerus and scapula move in the ratio of 2: 1 throughout abduction.

For every  $15^{\circ}$  of elevation  $10^{\circ}$  occur at shoulder joint and  $5^{\circ}$  due to movement of scapula.

### **CORACOACROMIAL ARCH - ATTACHMENTS AND FUNCTIONS (SA)**

Coracoacromial arch is formed by the coracoid process, acromion process and coracoacromial ligament between them.

#### **Function**

This ligamentous structure forms a protective arch for the head of humerus above and prevents its superior displacement above the glenoid cavity.

### **GLENOHUMERAL LIGAMENTS (SA)**

Glenohumeral ligaments are 3 thickenings in the anterior part of fibrous capsule of shoulder joint. They are visible only from the interior of the joint.

The ligaments are -

- superior glenohumeral ligament
- middle glenohumeral ligament

inferior Glenohumeral ligament

These ligaments strengthen the capsule and help in stability of the shoulder joint

### **MUSCLES PRODUCING ABDUCTION OF SHOULDER JOINT (SA)**

**Abduction is movement of upper limb away from the midline of the body in a coronal plane**

The muscle producing abduction are

Supraspinatus- first 15 degrees

Deltoid- 15 to 90 degrees

Serratus anterior and Upper and lower fibres of trapezius- over 90 degrees by scapular rotation.