UNIT 5

JOINTS

Shoulder and Elbow Joints

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RHPT Lecture 5
**Bursae**

**Definition:** They are sacs, related to some joints, lined by synovial membrane and containing synovial fluid.

**Function:** They help to reduce friction between opposite surfaces around the joints.

**Clinical importance:** They may be a source of pain and swelling in the region of the joints in case of their inflammation.

**Shoulder Joint**

**Type of the joint:** Synovial "ball-and-socket" joint.

**Articular parts:**

1. Head of humerus.
2. Glenoid cavity of scapula.
   
   The glenoid cavity is slightly deepened by a cartilaginous ring called: *labrum glenoidale*.

**Capsule**

The joint capsule is lax, especially inferiorly to allow wide range of movements. It is attached to the epiphseal line of the articulating parts, except infero-medially where it extends onto the shaft of the humerus for about half an inch. Therefore, osteomyelitis of humerus may extend directly to the joint.

It is strengthened by 3 capsular ligaments called gleno-humeral ligaments 'on the front of the capsule':

1. Superior gleno-humeral ligament.
2. Middle gleno-humeral ligament.
3. Inferior gleno-humeral ligament.

**Other extra-capsular ligaments:** include

1. Coracohumeral ligament: extends from the coracoid process of the scapula to the humerus (greater tuberosity), passing above the joint capsule
2. **Transverse humeral ligament**: extends between the 2 tuberosities of humerus, retains the biceps tendon in the bicipital 'intertubercular' groove.

3. **Coraco-acromial ligament**: It is a triangular ligament, extending from the apex of acromion to the coracoid process. It acts as a secondary socket for the head of humerus, preventing its upward dislocation.

**Stability of the joint:**

This depends mainly on the strength of the surrounding muscles:

1. **Rotator cuff muscles**: These are short muscles that are closely surrounding the joint capsule:

   i. Subscapularis muscle ------ anteriorly
   
   ii. Supraspinatus muscle------superiorly
   
   iii. Infraspinatus muscle and teres minor muscle------posteriorly.

   N.B.: These muscles do not serve only in moving the shoulder joint but they also support it by keeping the head of the humerus within the glenoid cavity, during movement of the shoulder joint. The support of rotator cuff muscles is deficient inferiorly.

2. **Tendon of long head of biceps brachii** that originates from the supra-glenoid tubercle and passes over the head of humerus within the joint capsule.

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*Muscles of Rotator cuff (upper and posterior aspects)*

*About Grant's Atlas of Anatomy*
Dislocation:
Shoulder is the most frequently joint to be dislocated. Dislocation of this joint mostly occurs antero-inferiorly. This is because the antero-inferior aspect of the capsule is the thinnest part and unsupported by rotator cuff muscles.
N.B.: Shoulder joint dislocation may result in injury of axillary nerve and paralysis of deltoid muscle.

Movements of the Shoulder Joint

I. Abduction: produced by
1. Supraspinatus: initiates abduction up to 18°
2. Deltoid: up to 90°
N.B.: Elevation of the arm above the head is produced via rotation of scapula done by trapezius and serratus anterior.
II. **Adduction**: produced by
   1. Pectoralis major
   2. Latissimus dorsi

III. **Flexion**: produced by
   1. Pectoralis major.
   2. Anterior fibers of deltoid.

IV. **Extension**: produced by
   1. Latissimus dorsi.
   2. Posterior fibers of deltoid.

V. **Circumduction**: Combination of the previous movements, done respectively in series.

VI. **Medial rotation**: produced by
   1. Pectoralis major.
   2. Anterior fibers of deltoid.
   3. Subscapularis.

VII. **Lateral rotation**: produced by
   1. Infraspinatus.
   2. Teres minor
   3. Posterior fibers of deltoid.

**Bursae Related To Shoulder Joint:**

Two large bursae are related to the joint:

1. **Subscapular bursa**:
   It lies anterior to the joint, between the tendon of subscapularis and the capsule of the joint. It communicates with the synovial cavity of the shoulder joint between the superior and middle glenohumeral ligaments.

2. **Subacromial bursa**:
   It lies superior and lateral to the joint, between the acromion and the capsule of the joint. Tendon of supraspinatus lies in its floor. This bursa does not communicate with the joint cavity. However, it is a common site of inflammation, especially following inflammation of supraspinatus, resulting in a pain in the region of the joint.
Elbow Joint

**Type of the joint:** Synovial "hinge" joint.

**Articular parts:** The joint is formed of '2' articulations:

1. **Humero-ulnar articulation:** formed by
   - Trochlea of humerus, and
   - Trochlear notch of ulna.

   *N.B.: This is the main part of joint. Therefore, it is sometimes referred as the true elbow joint.*

2. **Humero-radial articulation:** formed by
   - Capitulum of humerus, and
   - Head of radius.

**Capsule**

- The joint capsule is lax, anteriorly and posteriorly to allow movements. It is attached to the margins of the articulating parts. It is strengthened by 2 ligaments; medial and lateral collateral ligaments.
- It is lined with the synovial membrane which is continuous with that of the superior radio-ulnar joint.

**Movements of the Shoulder Joint**

*I. Flexion:* produced mainly by
   Biceps, brachialis and forearm flexor muscles.

*II. Extension:* produced mainly by
   Triceps muscle.

**Stability of the joint:**

It is a very stable hinge joint.

This depends mainly on the:

- Shape of the articulating bones: The wrench–shaped trochlear notch of ulna fits around the trchlea of humerus.
- The 2 strong collateral (medial and lateral) ligaments.
**Dislocation:**

- In adults, dislocation of elbow is rare. However, it occurs in case of fracture of bones e.g. fractures of coronoid process of ulna or supracondylar distal humeral fractures.
- In children, whilst ossification is not complete, dislocation of this joint is relatively common. Posterior dislocation is caused by falling on an outstretched hand.