

## **DEFINITIONS**

1. The **coraco-acromial arch** consists of
  - 1.1. the **acromion process** postero-superiorly
  - 1.2. the **coracoid process** anteriorly
  - 1.3. the strong **coraco-acromial ligament** joining the two.

It forms a canopy over the shoulder joint beneath which run the tendons of the Supraspinatus, Infraspinatus, Teres Minor and Subscapularis muscles. The tendons of these muscles form the "**rotator cuff**" and are closely blended with the capsule of the shoulder joint. The tendon of the supraspinatus is separated from the coraco-acromial arch by the thin sub-acromial bursa. There is an associated tendon, that of the **Long head of the Biceps Brachii**.

2. It is in this musculo-tendinous complex that painful **rotator cuff lesions** arise.

## **CLINICAL MANIFESTATIONS**

3. All patients with rotator cuff syndrome have similar signs and symptoms, that is, pain, muscle spasm, limitation of motion, muscle atrophy and tenderness over the insertion of the muscles. The symptoms vary in extent, depending upon the nature and duration of the lesion and the age of the patient. The following clinical presentations are recognised
  - 3.1. **Subacromial bursitis**. Inflammation of this bursa occurs practically always as a consequence of a lesion involving the neighbouring structures. The source of most pathological changes is the supraspinatus tendon. In fact, inflammation in it may be painless until the adjacent bursa is involved.
  - 3.2. **Acute Supraspinatus Tendinitis**. Those affected are in the age range 20 to 40 and are frequently athletic. The symptoms follow a minor sprain. Movements are not usually limited but there is a 'painful arc' between 60 and 120 degrees of abduction. This is sometimes called the '**painful arc syndrome**'. This condition is intensely painful but improves rapidly because the reaction or repair process in the young patient is vigorous.

- 3.3. **Chronic Supraspinatus Tendinitis.** This condition affects adults of all ages and there is usually a history of injury. There may be an acute phase after which the patient may develop gradually increasing stiffness and a constant ache over the greater tuberosity. This condition is almost always associated with the formation of calcareous deposits at the insertion of the tendon. These deposits are probably the result of degenerative changes in the avascular fibrous tissue from preceding acute tendinitis or tear. This condition is only moderately painful but takes many months to recover and may be complicated by tears or a 'frozen shoulder' because the repair process is less vigorous. Other complications include total disruption of the cuff, upward migration of the humeral head and osteoarthritis of the acromioclavicular and glenohumeral joints.
- 3.4. **Partial Rupture of the Supraspinatus Tendon.** This is a common sequel to tendinitis, acute or chronic. This condition is usually quite painful and sometimes may be indistinguishable from chronic tendinitis.
- 3.5. **Complete Rupture of the Supraspinatus Tendon and the Rotator Cuff.** There is a definite history of injury with an immediate weakness of abduction. Pain is usually minimal, if not completely absent, except at the time of injury. The primary diagnostic sign is a greater limitation of active than of passive movements. The patient is usually elderly, when the trauma is trivial, though it can occur in younger individuals when the trauma is more severe. It may sometimes be associated with dislocation of the shoulder joint. There may be a history of previous tendinitis. A complete rupture never heals on its own because the repair process is barely active.
- 3.6. **Bicipital Tendinitis.** Inflammation of the surrounding synovial sheath is the usual cause and is a result of trauma and a common sequel to rotator cuff lesions. It usually settles rapidly. However, sometimes a low grade inflammatory process evolves and leads to capsulitis of the shoulder joint.
- 3.7. **'Frozen Shoulder'.** This is also called **adhesive capsulitis** and accounts for far more cases of shoulder disability than supraspinatus tendinitis. It affects both males and females, over the age of 40 years and is frequently associated with bicipital tendinitis and rotator cuff tendinitis. Trauma and, paradoxically, inappropriate immobilisation are considered to be aetiological factors though lowered concentrations of immunoglobulins and an increased incidence of cell type HLA-B27 are also associated. The characteristic feature is gross limitation of movement with pain. This condition is self-limiting but symptoms can persist for 6 months or more.
- 3.8. **Periarthritis of the Shoulder.** This is a non-specific term used to describe a painful shoulder where none of the above diagnoses have been made and where there is no evidence of arthritis of the joint itself. This term is being used less and less frequently and one should generally avoid making such a diagnosis.

## AETIOLOGY

4. The differing clinical pictures stem from three basic pathological processes -

4.1. **degeneration** or 'wear'

4.2. **trauma** or 'tear'

4.3. **reaction** or 'repair'

### Degeneration

5. The tendinous fibres of the rotator cuff (especially the supraspinatus) undergo degenerative changes at or near their insertion (the 'critical zone') into the humerus with advancing age. This is observed in all shoulders after 60 years of age. Minute tears, fibrosis, fibro-cartilaginous metaplasia and calcification are sequelae.

### Trauma

6. The supraspinatus tendon is liable to injury if its contraction is resisted; this may occur when lifting a weight, or when the person falls on the outstretched hand to save himself from falling. Before the fifth decade the tendon is strong and avulsion of bone is more probable. Degeneration of the tendon predisposes to a tear and the more degenerate it is, the more easily it tears. In contrast, a more insidious type of trauma is attrition of the cuff due to impingement between the coraco-acromial arch and the head of the humerus during abduction/adduction movements. Normally the sub-acromial bursa minimises this friction, but with advancing age this protection becomes inadequate. The tendon of the long head of the biceps may also be abraded to the point of rupture. Tears of the cuff and the long head of biceps are common autopsy findings in almost everyone over 60 years of age and go hand in hand with the degenerative processes described above.

### Reaction

7. In an attempt to repair a tear or to revascularise a degenerate area, new blood vessels grow in. Calcified deposits, which are part of degenerative process, if present are phagocytosed. This vascular or 'inflammatory' reaction causes pain.

## CONCLUSION

8. **Rotator cuff syndrome** includes many clinical presentations, these being described above, and is usually related to ageing, trauma or a combination of both.

## REFERENCES

Duthie Robert B and Bentley George. Mercer's Orthopaedic Surgery. 8<sup>th</sup> Ed. 1983. Edward Arnold. p882-886.

Adams John Crawford and Hamblen David L. Outline of Orthopaedics. 11<sup>th</sup> Ed. 1990. Edinburgh. Churchill Livingstone. p213-218.

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