

ROTATOR CUFF ARTHROPATHY

Introduction

Neer [1983] Rotator cuff tear arthropathy
 (1) rotator cuff insufficiency,
 (2) degenerative changes of the glenohumeral joint
 (3) superior migration of the humeral head².

However, not all massive rotator cuff tear develop rotator cuff tear arthropathy. Although the true etiology of rotator cuff tear arthropathy is unclear, what is evident is that it is a difficult condition to treat, and surgical techniques for the management of rotator cuff tear arthropathy continue to evolve.

Facts

Females more common than men
Average age 70 years
Passive abduction: is less than 90°
Positive impingement signs and painful arc syndrome

Relevant Anatomy

1. Couple force: Between the deltoid muscle and the supraspinatus
2. The small contact surface area of the humeral head on the glenoid is 4 to 5 cm²,
3. The maximum depth of the cartilage-covered glenoid fossa to be approximately 2 to 4 mm transversely and 7 to 9 mm vertically, leaving approximately 85% of humeral articular cartilage unconstrained by the glenoid transversely and 65% unconstrained vertically

Pathogenesis

Halverson [1981] A crystal-mediated theory of rotator cuff tear arthropathy in which hydroxyapatite crystals induce a phagocytic degeneration of the rotator cuff tendons and articular cartilage [Milwaukee shoulder]. Phagocytosis of these crystals was hypothesized to result in further tissue degeneration.

Neer [1981] A massive rotator cuff tear was the inciting event in the development of rotator cuff tear arthropathy, and that both mechanical and nutritional factors contributed to the subsequent progression of the arthropathy .

Although numerous pathologic mechanisms for the development of rotator cuff tear arthropathy have been proposed, it remains unclear why only some patients with a massive rotator cuff tear progress to rotator cuff tear arthropathy.

Clinical

Basic information regarding the onset of pain, qualitative weakness, prior injuries or surgical

procedures, neurologic history, and functional deficits.

Have limited shoulder motion and stiffness. These symptoms may or may not have been precipitated by an acute, traumatic event.

Patients with a diagnosis another inflammatory arthropathy
May present with anterosuperior escape of the humeral head from the glenoid, indicating a grossly deficient subscapularis and supraspinatus.

More commonly, only marked atrophy of the shoulder musculature, especially of the supraspinatus and infraspinatus muscles

Both passive and active glenohumeral motion in patients with rotator cuff tear arthropathy will be limited by weakness, pain, and stiffness

Pseudoparalysis during attempted abduction and forward flexion. Deficiencies in the active range of motion will also be apparent in external rotation.

The strength of the rotator cuff musculature should be assessed in the standard fashion.

The supraspinatus Jobs test

The infraspinatus Resisted external rotation test.

The Subscapularis Lift-off test,[Gerber] or Belly press test

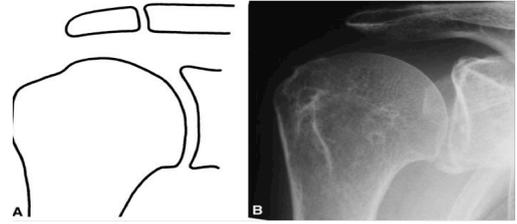
Horn Blower's Sign [Walsh]



Classification

Hamada Grading [Seebauer classification system]

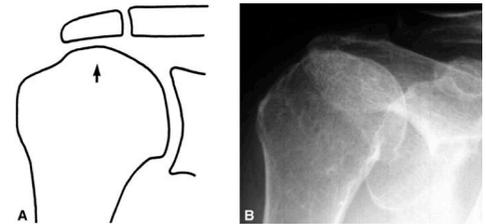
Grade 1 Acromio-humeral distance >6 mm



Grade 2

No Glenohumeral arthritis

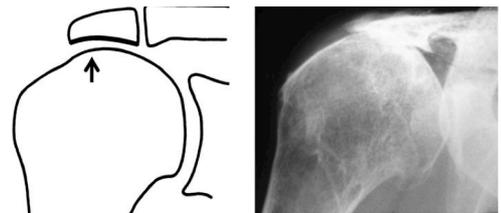
Acromio-humeral distance of < 5 mm



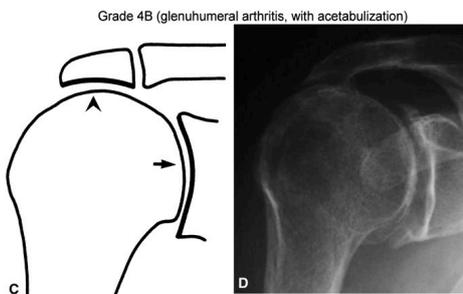
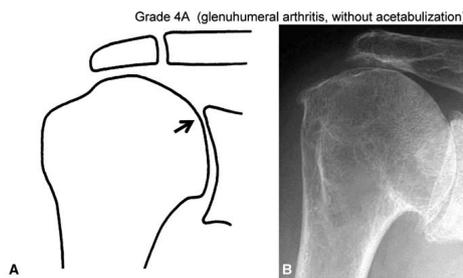
Grade 3

Acetabulisation

No glenohumeral arthritis



Grade 4 a and b

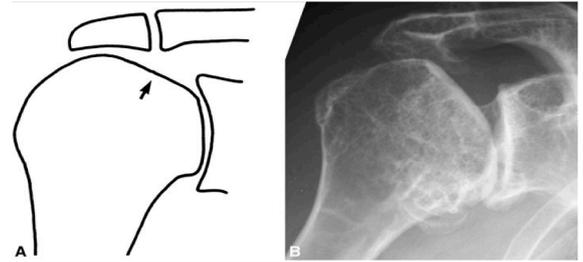


- A. GH arthritis without acetabulisation
- B. GH arthritis with acetabulisation

Femoralisation of humerus
 Rounding and tuberosity
 Acetabulisation of Glenoid and C-A arch
 Superior migration of the head
 Sclerosis of the joint surface

Grade 5

Arthritis with collapse of the head



Facts

- 1. Patients with Grade 3, 4, or 5 tears had a higher incidence of fatty muscle degeneration of the subscapularis muscle than patients in Grade 1 or 2 tears.
- 2. The retear rate of repaired supraspinatus tendon was more frequent in Grade 2 than Grade 1 tears. [$<5\text{mm}$]
- 3. Grade 3–5 tears at initial examination were on average older than those with Grade 1 or 2 tears
- 4. After glenohumeral arthritis (Grades 4 and 5) develops, arthrodesis, hemiarthroplasty, or total shoulder arthroplasty including reverse total shoulder arthroplasty should be considered, because the situation is shifted to articular cartilage degeneration.

Treatment

Non-operative treatment

Surgery in recalcitrant cases

1. Shoulder arthrodesis unattractive
2. Total shoulder arthroplasty High failure rate
3. Large head [CTA: cuff tear arthroplasty] is used very commonly
4. Reverse total shoulder joint is recently been very popular

Summary

Adequate treatment of the pathologic process of rotator cuff tear arthropathy remains a complicated problem.

Numerous pathways have been proposed as the cause of rotator cuff tear arthropathy, but the exact etiology remains unclear, as does the reason that only some patients with massive rotator cuff tears develop rotator cuff tear arthropathy.

Characteristic clinical examination findings include superior migration of the humeral head, pseudoparalysis with attempted elevation of the upper extremity at the shoulder, and a positive

hornblower's sign.

Radiographs demonstrating “femoralization” of the humeral head and “acetabulization” of the coracoacromial arch in cases of end-stage rotator cuff tear arthropathy can be diagnostic.

Although the initial management of rotator cuff arthropathy should begin with conservative measures, surgical intervention is often required.

Complication rates remain high, demonstrating the importance of strict patient selection and careful operative technique as well as the necessity of future design modifications.

Reference

1. Nam. VOLUME 94-A d NUMBER 6 d MARCH 21, 2012
2. [Milwaukee shoulder] [CORR 2011 469:2452–2460]