

## **Rotator Cuff Repair: Old & New Techniques**

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**Target audience:** Radiologists with special interest in musculoskeletal imaging

### **Learning objective:**

- To review arthroscopic techniques of rotator cuff repair
- To review MR findings of rotator cuff repair
- To describe complications of rotator cuff repair

Surgical options for rotator cuff repair include simple debridement of granulation tissue, tendon-to-tendon repair, or tendon-to-bone repair. Most small full-thickness rotator cuff repairs are performed by using tendon-to-bone repair. Rotator cuff tendon tears involving the myotendinous junction or critical zone may be treated with direct suture repair. Two-tendon tears and massive rotator cuff tears can be repaired by transosseous-equivalent (TOE) suture bridge repair technique. Double-row suture anchor repair is done in conjunction with creation of an implantation trough at the junction of the humeral head and greater tuberosity, allowing optimal apposition of tendon to bone. In the setting of bursal sided partial-thickness rotator cuff tears a subacromial decompression may also be performed if there are morphologic changes in the coracoacromial arch. Repair of high-grade articular sided tears may be accompanied by acromioplasty.

The postoperative shoulder can be evaluated using MR arthrography and conventional MRI. Direct MR arthrography is useful to distend the joint and improve contrast resolution to better evaluate the anastomosis. It is important to note that the repaired rotator cuff is not always water-tight and that communication between the glenohumeral joint and the subacromial-subdeltoid space may be an expected finding after rotator cuff repair. Also, absent communication between the glenohumeral joint and the subacromial-subdeltoid space does not eliminate the possibility of a tear as the defect may be filled with scar tissue.

Expected MR findings of a repaired tendon include low to intermediate signal intensity, tendon thickening or thinning and regular and irregular morphology. Curvilinear increased signal related to suture artifact can be seen. There may be scar tissue in the subacromial-subdeltoid space, and this can blend with rotator cuff signal. MR findings of clinical significance that should be reported include retractor (the size and the presence and extent of tendon retraction should be described), displaced or broken sutures, muscle atrophy, recurrent or residual subacromial spur, and glenohumeral osteoarthritis.

### **References:**

1. Zanetti M, Jost B, Hodler J, Gerber C. MR imaging after rotator cuff repair: full-thickness defects and bursitis-like subacromial abnormalities in asymptomatic subjects. *Skeletal Radiol* 2000; 29:314-319.
2. Mohana-Borges AV, Chung CB, Resnick D. MR imaging and MR arthrography of the postoperative shoulder: spectrum of normal and abnormal findings. *Radiographics*. 2004 Jan-Feb;24(1):69-85.
3. Bancroft LW, Wasyliw C, Pettis C, Farley T. Postoperative shoulder magnetic resonance imaging. *Magn Reson Imaging Clin N Am*. 2012 May;20(2):313-25
4. Chang EY, Chung CB. Current Concepts on Imaging Diagnosis of Rotator Cuff Disease. *Semin Musculoskelet Radiol* 2014; 18(04): 412-42