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## CASE REPORT

# Posterior interval tear after superior capsule reconstruction: a case report

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The treatment of chronic massive rotator cuff tears continues to challenge surgeons due to the complex nature of the underlying pathology. When considering treatment options, one must take into account the tissue quality and amount of tendon retraction in addition to previous operations performed.<sup>1</sup> Important aspects of tissue quality include the amount of muscle atrophy and fatty infiltration,<sup>6</sup> elasticity of the remaining tendon,<sup>1</sup> and patient-related factors such as age<sup>10</sup> and smoking status.<sup>7</sup> Numerous options for surgical treatment have been described, including débridement with subacromial decompression and modified acromioplasty,<sup>13</sup> partial rotator cuff repair,<sup>2</sup> biceps tendon interposition,<sup>12</sup> tendon transfer,<sup>5</sup> scaffold or tissue augmentation,<sup>1</sup> biodegradable subacromial spacer,<sup>3</sup> and reverse shoulder arthroplasty,<sup>17</sup> with varying results.

More concerning is the irreparable massive rotator cuff tear that leads to a disruption in the balanced force couple in the coronal plane and can ultimately result in altered glenohumeral mechanics and shoulder function.<sup>1</sup> Mihata et al<sup>8</sup> recently described superior capsule reconstruction (SCR) as a surgical option in irreparable rotator cuff tears to restore superior stability to the glenohumeral joint.

The original procedure used a fascia lata autograft to reconstruct the superior capsular layer, which comprises the inferior surface of the supraspinatus and infraspinatus in the

healthy rotator cuff. Arthroscopic fixation of the graft to the superior glenoid and the lateral insertion site of the rotator cuff on the greater tuberosity theoretically balances the coronal forces acting on the glenohumeral joint and restores shoulder function. Tokish and Beicker<sup>15</sup> described a modification of this technique using an acellular dermal allograft to eliminate donor-site morbidity, with promising short-term results.

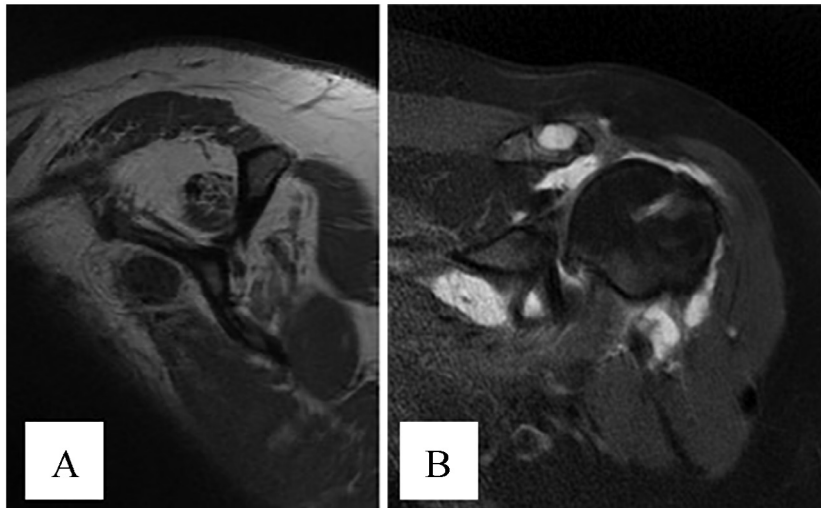
We report a case of arthroscopic SCR with dermal allograft for an irreparable rotator cuff repair that required a second-look arthroscopy, after a traumatic injury, to revise the graft continuity using side-to-side suturing to the native infraspinatus tissue.

## Case report

A 53-year-old man with a history of a left massive rotator cuff tear from a work-related injury presented to the senior author (G.R.) for a second opinion for continued pain and shoulder dysfunction after arthroscopic rotator cuff repair approximately 12 months earlier. On physical examination, his left shoulder range of motion consisted of painful active forward elevation to 140°, external rotation to 80°, and internal rotation to 50° with the arm in 90° of abduction. His passive range of motion was 170° of forward elevation, 80° of external rotation, and 55° of internal rotation while supine on the examination table. He also demonstrated pseudoparalysis with external rotation strength of 3/5 and a notable external rotation lag sign.<sup>16</sup> Magnetic resonance imaging (MRI) demonstrated postsurgical changes, with a full-thickness tear

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**Figure 1** Left shoulder magnetic resonance images before superior capsular reconstruction: (A) sagittal T1 image demonstrates fatty infiltration and atrophy of the supraspinatus and infraspinatus and (B) axial T2 cut with previous implant and supraspinatus tendon retraction to the glenoid.

of the supraspinatus tendon, fatty infiltration, and retraction to the glenoid rim (Fig. 1).

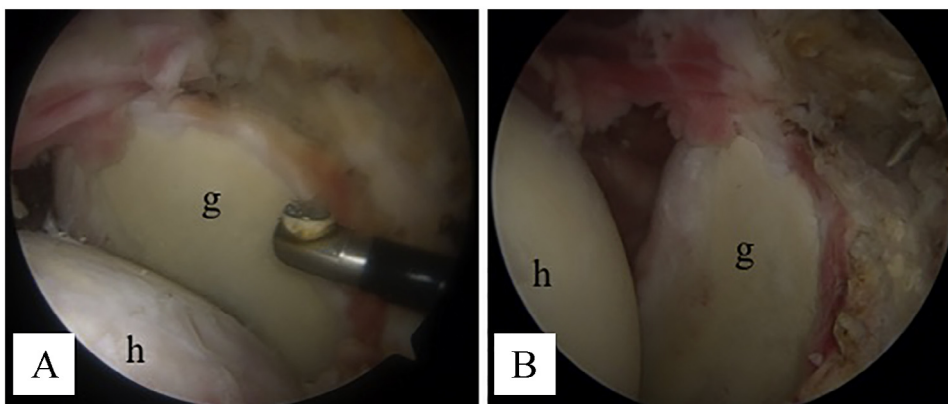
Given the patient's young age and high-demand profession as a carpenter, the option of repeat arthroscopy was discussed, with revision repair or partial repair of the torn rotator cuff vs. SCR to prevent superior humeral migration if the tissue was irreparable.

Massive tearing of the supraspinatus and the upper portion of infraspinatus was found intraoperatively. After extensive débridement and evaluation of the remaining tissue, the rotator cuff tear was deemed irreparable (Fig. 2), and SCR was performed with an acellular dermal allograft according to previously described techniques.<sup>8,15</sup> The dermal allograft was secured to the remaining infraspinatus tissue with 3 side-to-side convergence stitches from medial to lateral using high-strength suture and a suture passer. An anchor was not used to advance the residual infraspinatus because it was well-attached to the bone.

The patient was immobilized for 6 weeks postoperatively with hand, wrist, and elbow exercises only, followed by gentle passive stretching and initiation of active range of motion exercises. Strengthening was permitted 4 months postoperatively.

At the 3-month follow-up, the patient was pain free, with active range of motion of 150° forward flexion, 80° of external rotation, and 50° of internal rotation. His external rotation strength was 4/5.

At 4 months postoperatively, the patient presented with a sudden onset of pain after a fall off a ladder into the wall while changing a spotlight. Physical examination demonstrated painful active elevation to 140°, external rotation to 60°, and internal rotation to 50°. His external rotation strength was 3 + /5 with notable pain on resistance. The patient was instructed to continue the rehabilitation program with close observation. A repeat MRI was ordered at the 6-month follow-up because he did not have an improvement in pain, external



**Figure 2** (A and B) Intraoperative arthroscopic findings of a massive rotator cuff tear involving the supraspinatus and infraspinatus with exposed humeral head (h) and retraction medial to the glenoid rim (g).

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