

Editorial Commentary: Side-to-side Rotator Cuff Repairs—Are Perfectly Placed Sutures Enough?



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Abstract: Arthroscopic side-to-side rotator cuff repair of large U-shaped tears should incorporate repair of the greater tuberosity. Recent research has found that pain at rest and with motion, range of motion, strength, and University of California—Los Angeles and Constant scores improved overall in patients with side-to-side repairs. Although the clinical results were quite good overall, rotator cuff healing was found to be significantly better, with 28% improvement confirmed by magnetic resonance imaging evidence of healing when the side-to-side repair was further repaired to the tuberosity.

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In “Arthroscopic Side-to-side Repair for Large U-Shaped Full-Thickness Rotator Cuff Tears: Is the Repair Integrity Actually Maintained?,” Kim, Rhee, Kim, Ro, and Rhee¹ at Kyung Hee University in Seoul, Republic of Korea, reviewed 1,804 rotator cuff repairs performed over a period of 7 years. During that span, 71 patients met the inclusion criteria whereas 12 patients either were lost to follow-up or refused follow-up magnetic resonance imaging (MRI), leaving 59 patients in the study. Kim et al.¹ followed up all 59 patients for at least 2 years and obtained an MRI scan at least 10 months after the initial repair. They retrospectively divided the cohort into 2 arms: patients with suture-only side-to-side repair and patients with side-to-side repair in addition to repair of the greater tuberosity with anchors. The challenge they report consistently vexes shoulder surgeons. Large tears, even those with a short anterior-to-posterior span (also conceptualized as tears with a small front-to-back distance along the greater tuberosity) that seem favorable for repair, are difficult to heal even in the most experienced surgeons’ hands. The study reflects this in the high MRI-diagnosed retear rate found both after side-to-side repair alone, with a 73.7% retear rate, and after side-

to-side repair along with tuberosity repair, with a 45% retear rate.

These large side-to-side tears, with a long distance from the tuberosity to the apex of the tear, can result from large U-shaped tears. The challenge of pulling the tendon directly to the tuberosity is over-tensioning the repair. Mazzocca et al.² showed that side-to-side margin convergence bringing the front and back portions together first offloads the strain on the tendon repair and decreases the gap from the tuberosity. Thus, margin convergence has become the standard to optimize alignment of these challenging repairs.

Wolf et al.,³ Rousseau et al.,⁴ and Kim et al.⁵ all found improved clinical results with side-to-side repair, as well as side-to-side repair with tuberosity repair. Rousseau et al. noted that a side-to-side repair combined with a single-row tuberosity repair yielded good or very good satisfaction in 88% of cases. Despite their excellent clinical results, 44% of repairs unfortunately did not heal on postoperative ultrasound. Kim et al.⁵ found a 47.8% retear rate on either MRI or ultrasound at greater than 1 year of follow-up after arthroscopic side-to-side repair and tuberosity fixation of U- or V-shaped tears. In their study, functional outcome scores, range of motion, and pain all significantly improved. The current study by Kim et al.¹ identified similar good clinical results despite the high MRI retear rate. Although these 2 studies were marginally different, their results showed amazingly consistent similarities. Kim et al.¹ found that pain at rest and with motion, range of motion, strength, and University of California—Los Angeles and Constant scores

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improved overall in their patients with side-to-side repairs. Jones and Savoie⁶ also described good or excellent clinical results in 88% of cases after arthroscopic side-to-side repair of 47 large and massive tears. Thus, one could expect that a well-performed side-to-side repair will lead to good clinical outcomes.

It is interesting to note that Nové-Josserand et al.⁷ performed an open side-to-side repair of U-shaped tears (which they could not repair primarily to bone) in 35 patients, with all but 3 undergoing transosseous suture fixation after the side-to-side repair. They found both good clinical results, with 88% of patients satisfied, and good results on postoperative ultrasound evaluation or computed tomography arthrogram (17.1% retear rate). Unfortunately, 16 patients were lost to follow-up and 4 did not undergo appropriate postoperative imaging in their retrospective study.

Other than traditional side-to-side repair, one well-described technique is a shoestring-type side-to-side repair of the tendon as reported by Van der Zwaal et al.⁸ However, fewer long-term follow-up and anatomic follow-up studies of this technique have been performed compared “traditional” side-to-side repair.

Kim et al.¹ did a commendable job of trying to parse out fatty atrophy of the rotator cuff muscles and patient age as possible confounding comorbidities. The findings were as one would expect, with younger patients and patients with less muscular fatty atrophy having better healing. Kim et al.¹ also noted that one great challenge is to ensure the original tear pattern is recognized and corrected. They included this in the limitations of their study, but again, it is a challenge vexing nearly all shoulder surgeons. They supposed that a side-to-side repair of a posterior-based L-shaped tear pattern rather than what was thought to be a U-shaped tear would lead to inappropriate tension and subsequent failure. Minimizing tendon-to-bone repair tension is one of the key values of a side-to-side technique. Properly lining up the front and back portions of the tendon, avoiding “bunching” or “constraining” of the tendon, is a critical aspect of this technique, as emphasized.

The extensive clinical and MRI follow-up and detailed technique set the study by Kim et al.¹ apart. The lead

surgeon’s experience adds to the value of this article. The information provided will help surgeons counsel patients about expected outcomes, especially noting potentially worse healing in older patients with higher Goutallier scores owing to increased muscular fatty atrophy.⁹

Optimizing repair of large U-shaped tears challenges the best shoulder surgeons. Including anchor repair of the tuberosity will continue to be a necessary component to success.

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