

Editorial Commentary: Increased Graft Thickness With Superior Capsular Reconstruction Results in Improved Acromiohumeral Distance, but Increased Graft Tear Rate and Lateral Acromial Erosion



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Abstract: For the treatment of irreparable posterosuperior rotator cuff tears of the supraspinatus and infraspinatus, superior capsular reconstruction (SCR) has continued to supplant other less successful and/or reproducible techniques, including partial rotator cuff repair and latissimus tendon transfer. After its initial description utilizing a folded fascia lata autograft with a thickness of up to 8 mm, many in North America adapted their surgical technique to use commercially available human dermal allograft to mitigate donor site morbidity. Early series have revealed the importance of graft thickness in predicting risk of radiographic or clinical failure. As a result, there has been a renewed interest in increasing the thickness of an SCR graft to further prevent superior humeral head translation and diminish subacromial contact pressures and secondary radiographic, or more importantly, clinical failure. Some authors have sought to augment dermal allografts for increased stiffness, whereas other authors have explored the option of adding a separate graft on the undersurface of the acromion for a bursal acromial reconstruction. Although this increased graft thickness may result in improved acromiohumeral distance and clinically significant patient improvement, secondary graft retear and acromial osteolysis may develop due to increased friction or “overstuffing” of the subacromial space.

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For the treatment of irreparable posterosuperior rotator cuff tears of the supraspinatus, SCR has continued to supplant other less successful and/or reproducible techniques, such as partial repair and latissimus transfer. After the initial description of SCR utilizing a folded fascia lata autograft with a graft thickness of approximately 5 to 8 mm, many in North America adapted their surgical technique to use

commercially available human dermal allograft to mitigate donor site morbidity, at least in part. Early series have revealed the importance of graft thickness in predicting favorable clinical outcomes, or conversely, increased rates of failure.¹

Currently, a dermal allograft of at least 3 mm (or greater) has been recommended as the current standard of practice. However, other authors have demonstrated significant elongation (15%) of these single layer dermal grafts, even with appropriate tensioning protocol in 30° of glenohumeral abduction.² In turn, there has been a renewed interest in increasing thickness of graft to further prevent superior humeral head translation, subacromial contact pressures, and secondary radiographic or, more importantly, clinical failure.³ Some authors have sought to double up dermal allografts for increased stiffness,^{4,5} whereas other authors have explored the option of adding a separate graft on the undersurface of the acromion for a bursal acromial reconstruction.^{6,7} Although this expanded SCR construct contributes increased tissue requirements and further financial cost, the impact on

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graft integration and humeral or glenoid bone stock remains largely unclear.

In the current article entitled “Shoulder Superior Capsular Reconstruction Hybrid Graft Thickness Greater Than Preoperative Acromiohumeral Distance Increases Graft Retear Rate and Subacromial Erosion,”⁸ Chang Hee Baek and Jung Gon Kim present their novel case series of 58 patients with massive rotator cuff tears that underwent SCR using a hybrid graft comprised of both fascia lata and dermal allograft. Under the pretense that the increased graft thickness afforded by fascia lata would complement the smooth gliding surface of the dermal allograft, the authors assembled a composite graft thickness that averaged approximately 10.9 mm (range, 6-19). With a minimum 24-month follow-up, improvement was noted in visual analog scale, ASES, Constant, UCLA, range of motion, and ADLER scores from baseline, with close to two-thirds of patients (62.1%) achieving minimal clinically important difference. On the other hand, only 1 in 5 patients (19%) achieved patient acceptable symptomatic state, indicating satisfaction with their procedure. Remarkably, 50% of grafts demonstrated re-tear in the current study, with increased graft thickness and smaller preoperative acromiohumeral distance significantly associated with postoperative discontinuity on serial MRI. Furthermore, when the graft thickness exceeded the baseline acromiohumeral distance, not only was there higher rate of secondary re-tear after SCR but also increased risk of acromial osteolysis. Despite these radiographic findings, the authors reported no significant differences in patient-reported outcomes, MCID, and/or patient acceptable symptomatic state between those groups with and without graft re-tear.

Although a small series with inherent limitations due to statistical power, this is a noteworthy, single-surgeon experience that explores the ideal balance between SCR graft thickness, radiographic healing, and patient-reported function or satisfaction. As the authors candidly state, “[T]hick and stiff grafts do not yield favorable results unconditionally.”⁸ Other authors have also suggested higher rates of osteolysis with advanced acromiohumeral remodeling, with Hamada Grade 3 patients experiencing up to 5-fold higher risk of reactive changes in the absence of graft re-tear.⁹ With that said, the clinical significance of SCR graft discontinuity and secondary osteolysis is still under debate,^{10,11} and we should continue to carefully monitor these patients as they proceed to other end-stage treatments such as reverse total shoulder arthroplasty.¹² As we continue to bridge the gap between East and West in terms of surgical technique for SCR, this study should serve as a cautionary tale to those seeking to maximize graft

thickness for those with advancing cuff tear arthropathy, particularly those with acromiohumeral distance narrowing. Regrettably, our search for surgical best practices continues with SCR, but we are edging closer to the ideal patient selection and surgical decision-making for our young patients with irreparable posterolateral rotator cuff tears.¹³⁻¹⁵

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