

Editorial Commentary: Optimizing Indications for Shoulder Superior Capsular Reconstruction: Choose the Right Patient at the Right Time!



Christopher Gibbs, M.D., Brian Godshaw, M.D., and Bryson Lesniak, M.D.

Abstract: Superior capsular reconstruction has gained popularity for the management of massive, irreparable rotator cuff tears in young patients with minimal glenohumeral arthritis. Short-term outcomes show significant improvements in pain and function. However, the failure rate has been reported to range from 3% to 36%, with higher failure rates in women and patients with subscapularis tears, a greater body mass index, lower preoperative forward flexion, a lower preoperative acromiohumeral distance, subscapularis atrophy, and advanced rotator cuff arthropathy. Inadequate restoration of the acromiohumeral distance and poor integrity of posterior remnant tissue postoperatively have also been associated with an increased risk of retear. Currently accepted indications include younger patients (aged < 65-70 years) with irreparable, massive rotator cuff tears involving the supraspinatus and infraspinatus with minimal arthritis, an intact or repairable subscapularis, and a functional deltoid without bony deficiency, stiffness, or advanced arthropathy.

See related article on page 460

Orthopaedic surgeons continue to be challenged by massive, irreparable rotator cuff tears that fail conservative management in young, active patients as a multitude of proposed surgical interventions have failed to show consistently reliable improvement in pain and function with a low complication rate.¹ Superior capsular reconstruction (SCR) has gained popularity recently for the management of massive, irreparable rotator cuff tears in young patients with minimal glenohumeral arthritis, with short-term outcomes showing significant improvements in both pain and function.²⁻⁶ However, as with any surgical procedure, appropriate indications must be followed to obtain optimal outcomes. Therefore, investigations to understand the risk factors for failure after SCR are important for the continued refinement of appropriate indications for this promising treatment strategy.

We commend Gilat, Haunschild, Williams, Fu, Garrigues, Romeo, Verma, and Cole⁷ on their recent study

investigating the risk factors for clinical failure after arthroscopic SCR, entitled “Patient Factors Associated With Clinical Failure Following Arthroscopic Superior Capsular Reconstruction.” This study showed a higher rate of clinical failure in female patients or patients with subscapularis tears. A greater body mass index, lower preoperative forward flexion, and a lower preoperative acromiohumeral distance were also possibly associated with clinical failure. Finally, significant improvements in patient-reported outcomes were found postoperatively in the studied cohort of patients.

After the introduction of SCR by Mihata et al.⁴ in 2012 as a viable method for restoring glenohumeral stability, the short-term clinical outcomes after this procedure have been promising, with reports of significantly improved pain and function at 1- to 2-year follow-up.²⁻⁶ Recent systematic reviews of the modern literature have concluded that significant improvements in pain, postoperative strength, range of motion, and patient-reported outcomes can be expected in the first 2 years after surgery.^{8,9} However, the failure rate has been reported to range from 3% to 36%, aligning with the rate of 20% reported by Gilat et al.,⁷ highlighting the need for additional investigations to improve the success of this procedure.

Providing the best care for patients means giving them the best chance of success after SCR, including

Pittsburgh, Pennsylvania

The authors report no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

© 2020 Published by Elsevier on behalf of the Arthroscopy Association of North America

0749-8063/201923/\$36.00

<https://doi.org/10.1016/j.arthro.2020.12.178>

identifying the factors that increase each patient's risk of failure. Previous studies have shown that subscapularis atrophy and advanced rotator cuff arthropathy are significantly associated with failure of graft healing.³ Inadequate restoration of the acromiohumeral distance and poor integrity of posterior remnant tissue postoperatively have also been associated with an increased risk of re-tear.¹⁰ The efforts of Gilat et al.⁷ have now identified patient-specific characteristics that may increase the risk of poor outcomes after SCR.

The results of this study are useful in continually refining the currently accepted indications for SCR to appropriately counsel patients preoperatively. Currently accepted indications include younger patients (aged < 65-70 years) with irreparable, massive rotator cuff tears involving the supraspinatus and infraspinatus with minimal arthritis, an intact or repairable subscapularis, and a functional deltoid without bony deficiency, stiffness, or advanced arthropathy.^{11,12} The findings of Gilat et al.⁷ particularly highlight the importance of a functional subscapularis muscle to postoperative outcomes after SCR because patients with a subscapularis tear were at significantly higher risk of clinical failure. Additionally, female patients should be informed of a lower likelihood of a satisfactory outcome compared with their male counterparts. Knowledge of, and rigid adherence to, these indications is helpful in preventing overutilization of this useful procedure, which could lead to less-than-optimal outcomes.

Finally, although Gilat et al.⁷ have done an admirable job identifying additional risk factors for failure, we believe that continued efforts are needed to optimize indications for SCR to achieve the best possible patient outcomes. SCR is a relatively new technique for the treatment of massive, irreparable rotator cuff tears, and as such, the literature is lacking in the study of long-term outcomes.¹¹ Additionally, higher-quality evidence is necessary because previous studies consist primarily of Level III and IV analyses.^{8,9} Such information will be critical to ultimately determine the appropriate role of SCR in the treatment of massive, irreparable rotator cuff tears in our patients.

In conclusion, every effort should be made to optimize each patient's chance of success after SCR, and this includes knowledge of the risk factors that lead to failure. This knowledge allows for informed perioperative decision making, including knowing when and in whom to intervene. In their study, Gilat et al.⁷ identified multiple risk factors for failure including female sex and the presence of a subscapularis tear. In our experience, SCR

provides an excellent outcome when performed in the right patient at the right time.

References

1. Tokish JM, Makovicka JL. The superior capsular reconstruction: Lessons learned and future directions. *J Am Acad Orthop Surg* 2020;28:528-537.
2. Pennington WT, Bartz BA, Pauli JM, Walker CE, Schmidt W. Arthroscopic superior capsular reconstruction with acellular dermal allograft for the treatment of massive irreparable rotator cuff tears: Short-term clinical outcomes and the radiographic parameter of superior capsular distance. *Arthroscopy* 2018;34:1764-1773.
3. Denard PJ, Brady PC, Adams CR, Tokish JM, Burkhart SS. Preliminary results of arthroscopic superior capsule reconstruction with dermal allograft. *Arthroscopy* 2018;34:93-99.
4. Mihata T, McGarry MH, Pirolo JM, Kinoshita M, Lee TQ. Superior capsule reconstruction to restore superior stability in irreparable rotator cuff tears: A biomechanical cadaveric study. *Am J Sports Med* 2012;40:2248-2255.
5. Mihata T, Lee TQ, Watanabe C, et al. Clinical results of arthroscopic superior capsule reconstruction for irreparable rotator cuff tears. *Arthroscopy* 2013;29:459-470.
6. Burkhart SS, Prankun JJ, Hartzler RU. Superior capsular reconstruction for the operatively irreparable rotator cuff tear: Clinical outcomes are maintained 2 years after surgery. *Arthroscopy* 2020;36:373-380.
7. Gilat R, Haunschild ED, Williams BT, et al. Patient factors associated with clinical failure following arthroscopic superior capsular reconstruction. *Arthroscopy* 2021;37:460-467.
8. Catapano M, de SA D, Ekhtiari S, Lin A, Bedi A, Lesniak BP. Arthroscopic superior capsular reconstruction for massive, irreparable rotator cuff tears: A systematic review of modern literature. *Arthroscopy* 2019;35:1243-1253.
9. Sochacki KR, McCulloch PC, Lintner DM, Harris JD. Superior capsular reconstruction for massive rotator cuff tear leads to significant improvement in range of motion and clinical outcomes: A systematic review. *Arthroscopy* 2019;35:1269-1277.
10. Lee S-J, Min Y-K. Can inadequate acromiohumeral distance improvement and poor posterior remnant tissue be the predictive factors of re-tear? Preliminary outcomes of arthroscopic superior capsular reconstruction. *Knee Surg Sports Traumatol Arthrosc* 2018;26:2205-2213.
11. Galvin JW, Kenney R, Curry EJ, et al. Superior capsular reconstruction for massive rotator cuff tears: A critical analysis review. *JBJS Rev* 2019;7:e1.
12. Noyes MP, Haidamous G, Spittle NE, Hartzler RU, Denard PJ. Surgical management of massive irreparable cuff tears: Superior capsular reconstruction. *Curr Rev Musculoskelet Med* 2020;13:717-724.