

Editorial

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Can “infraspinatus rotational transfer” be a surgical option for severe rotator cuff tears?

Doo-Sup Kim^{1,2}, Younghwan Jang^{1,2}

¹Department of Orthopedic Surgery, Yonsei University Wonju College of Medicine, Wonju, Korea

²Yonsei Institute of Sports Science and Exercise Medicine, Wonju, Korea

The treatment of severe rotator cuff tears remains challenging [1]. Complete repair of a rotator cuff tear gives good results, but some cases are difficult to repair due to severe retraction or poor quality [2]. Therefore, in severe rotator cuff tear, various surgical methods such as debridement, partial repair, tendon transfer, superior capsule reconstruction, and reverse shoulder arthroplasty have been introduced. However, the optimal method is controversial due to its high failure rate, longevity concerns, and unpredictable results [3-5].

The importance of covering the original footprint in rotator cuff repair is well known [6]. However, the re-tear rate increases when excessive tension is applied to the repaired rotator cuff tendon [7]. After Debeyre et al. [8] introduced the muscle advancement technique to elevate the supraspinatus from the supraspinatus fossa for covering the footprint in 1965, various modifications have been reported. Recently, Yokoya et al. [9] and Gupta et al. [10] reported good results using both supraspinatus and infraspinatus advancement techniques.

On the other hand, Harada et al. [11] introduced a new surgical method for severe rotator cuff tear using only infraspinatus advancement in "The clinical outcomes of infraspinatus rotational transfer for irreparable posterosuperior rotator cuff tears: a preliminary report." In this study, Harada reported a low failure rate (2/34, 5.9%) at 1 year after surgery in 34 patients. Compared

with the failure rate of previous surgical methods of severe rotator cuff tear, the results were superior or similar [12]. Rotator cuff repair using its own tendon produces better results than other reconstruction or transfer surgery [9]. It is also meaningful in that it showed satisfactory results even at the age of 75 or older. All functional scores and shoulder elevation range were significantly improved after 1 year of surgery. However, there was no improvement in external rotation range or strength related to the infraspinatus. As mentioned by the authors, the elevation was improved by increasing the efficiency of the deltoid muscle due to the “spacer effect” of the transferred infraspinatus, but the function of the infraspinatus may have been sacrificed. However, previous muscle advancement studies have shown improved external rotation strength in the 2-year follow-up after surgery, so close observation is likely to be required [13].

There is a risk of suprascapular nerve palsy in this muscle advancement technique [14]. Compared to the recent surgical technique that advanced both infraspinatus and supraspinatus, in case of advancement of only the infraspinatus, a longer length of infraspinatus must be advanced to cover the great tuberosity. This may cause retraction of the suprascapular nerve and may increase the risk of palsy. Therefore, suprascapular nerve release will have to include cutting of the transverse scapular ligament during surgery [15]. It is also necessary to consider cosmetic is-

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Correspondence to: Doo-Sup Kim

Department of Orthopedic Surgery, Yonsei University Wonju College of Medicine, 20 Ilsan-ro, Wonju 26426, Korea

Tel: +82-33-741-1356, Fax: +82-33-741-1357, E-mail: dskim1974@yonsei.ac.kr, ORCID: <https://orcid.org/0000-0002-9025-085X>

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sues due to open surgery and scapular dyskinesia due to muscle damage around the scapular.

Nevertheless, “infrapinatus rotational transfer” may be a good surgical option for severe rotator cuff tears. However, in a situation where various surgical methods for irreparable rotator cuff tear are being reported, biomechanical studies and comparison studies that can show superiority are needed. In addition, due to the short follow-up period, research on long-term outcomes and complications should continue.

ORCID

Doo-Sup Kim <https://orcid.org/0000-0002-9025-085X>
 Younghwan Jang <https://orcid.org/0000-0002-5545-6078>

REFERENCES

- Boileau P, Brassart N, Watkinson DJ, Carles M, Hatzidakis AM, Krishnan SG. Arthroscopic repair of full-thickness tears of the supraspinatus: does the tendon really heal. *J Bone Joint Surg Am* 2005;87:1229-40.
- Henry P, Wasserstein D, Park S, et al. Arthroscopic repair for chronic massive rotator cuff tears: a systematic review. *Arthroscopy* 2015;31:2472-80.
- Lädermann A, Denard PJ, Collin P. Massive rotator cuff tears: definition and treatment. *Int Orthop* 2015;39:2403-14.
- Sershon RA, Van Thiel GS, Lin EC, et al. Clinical outcomes of reverse total shoulder arthroplasty in patients aged younger than 60 years. *J Shoulder Elbow Surg* 2014;23:395-400.
- El-Azab HM, Rott O, Irlenbusch U. Long-term follow-up after latissimus dorsi transfer for irreparable posterosuperior rotator cuff tears. *J Bone Joint Surg Am* 2015;97:462-9.
- Yoo JC, Ahn JH, Koh KH, Lim KS. Rotator cuff integrity after arthroscopic repair for large tears with less-than-optimal footprint coverage. *Arthroscopy* 2009;25:1093-100.
- Davidson PA, Rivenburgh DW. Rotator cuff repair tension as a determinant of functional outcome. *J Shoulder Elbow Surg* 2000;9:502-6.
- Debeyre J, Patie D, Elmelik E. Repair of ruptures of the rotator cuff of the shoulder. *J Bone Joint Surg Br* 1965;47:36-42.
- Yokoya S, Nakamura Y, Harada Y, Ochi M, Adachi N. Outcomes of arthroscopic rotator cuff repair with muscle advancement for massive rotator cuff tears. *J Shoulder Elbow Surg* 2019;28:445-52.
- Gupta A, Ker AM, Maharaj JC, Veen EJ, Cutbush K. All-arthroscopic muscle slide and advancement technique to repair massive retracted posterosuperior rotator cuff tears. *Arthrosc Tech* 2021;10:e1439-46.
- Harada N, Ishitani E, Gotoh M, Shiba N. The clinical outcomes of infrapinatus rotational transfer for irreparable posterosuperior rotator cuff tears: a preliminary report. *Clin Shoulder Elb* 2022;25:195-201.
- de Campos Azevedo CI, Andrade R, Leiria Pires Gago Ângelo AC, et al. Fascia lata autograft versus human dermal allograft in arthroscopic superior capsular reconstruction for irreparable rotator cuff tears: a systematic review of clinical outcomes. *Arthroscopy* 2020;36:579-91.e2.
- Yokoya S, Harada Y, Negi H, Matsushita R, Matsubara N, Adachi N. Arthroscopic rotator cuff repair with muscle advancement and artificial biodegradable sheet reinforcement for massive rotator cuff tears. *Orthop J Sports Med* 2020;8:2325967120960166.
- Warner JP, Krushell RJ, Masquelet A, Gerber C. Anatomy and relationships of the suprascapular nerve: anatomical constraints to mobilization of the supraspinatus and infrapinatus muscles in the management of massive rotator-cuff tears. *J Bone Joint Surg Am* 1992;74:36-45.
- Lafosse L, Tomasi A, Corbett S, Baier G, Willems K, Gobezie R. Arthroscopic release of suprascapular nerve entrapment at the suprascapular notch: technique and preliminary results. *Arthroscopy* 2007;23:34-42.