Arthroscopic Repair of Large and Massive Rotator Cuff Tears Complete Repair with Aggressive Release Compared with Partial Repair Alone at a Minimum Follow Up of 5 Years

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INTRODUCTION:

In many cases, chronic large and massive rotator cuff tears have associated retraction of a torn tendon and fatty infiltration of the affected muscle. Lo and Burkhart subsequently extended the concept of posterior interval slide technique, which is used when an anterior interval slide alone does not achieve acceptable mobility. The posterior interval slide is a release of the retracted rotator cuff tendon at the interval between the supraspinatus and infraspinatus tendons along the scapular spine, thereby further improving mobility of the tethered torn tendon and reducing tension at the repair site.

The purpose of this retrospective study was to assess the clinical and radiographic outcomes of large and massive rotator tears treated with arthroscopic complete repair with a posterior interval slide compared with partial repair without a posterior interval slide at a minimum follow up of 5 years. In accordance with our previous study with short-term follow up, we hypothesized that the patients in the complete-repair group with the posterior interval slide would experience inferior clinical and radiographic outcomes compared with those in the partial repair group without the posterior interval slide.

METHODS:

Study Population: The study population included 107 patients with large and massive rotator cuff tears that were unable to be treated by arthroscopic complete repair with an anterior interval slide and margin convergence. These patients underwent either arthroscopic complete repair with an additional posterior interval slide and a following side-to-side repair of the interval slide edge (complete-repair group) or arthroscopic partial repair with margin convergence alone without the additional posterior interval slide (partial-repair group) between March 2008 and July 2012.

Clinical Assessments: Clinical assessment included the VAS pain score (range, 0 to 10), the SSV score, the ASES score, the UCLA shoulder score, and an active range of motion assessment. The shoulder range of motion included 3 movements. Forward elevation (in the scapular plane), external rotation (with the arm at the side), and internal rotation were measured. Internal rotation was determined by measuring the highest spinal segment that the patient was able to reach with their thumb.

Radiographic Assessments: Preoperative radiographic evaluation included true anteroposterior and axillary lateral radiographs and MRA. Six months after the surgical procedure, MRA was acquired to evaluate the structural integrity of the repair. The preoperative tear size and the postoperative retear size or the residual defect after partial repair were defined as the maximum anteroposterior width on a fat-suppressed T1-weighted sagittal oblique image on MRA. The preoperative and postoperative degree of fatty infiltration was determined on the most-lateral T1-weighted sagittal oblique image where contact of the scapular spine with the scapula was observed.

RESULTS:

Clinical Outcomes: At the time of the latest follow up, the mean VAS pain, SSV, ASES, and UCLA shoulder scores improved significantly in both groups compared with preoperative values ($p < 0.001$); however, there were no significant differences between groups. Active forward elevation, external rotation with the arm at the side, and internal rotation also improved significantly in both groups compared with preoperative values ($p < 0.001$); however, there were no significant differences in range of motion between groups.

Radiographic Outcomes: The preoperative mean tear size was 32.2 mm in the complete repair group and 32.5 cm in the partial-repair group. On follow-up MRA at 6 months postoperatively, a retear was identified in 22 (88%) of the 25 patients in the complete-repair group, with a mean retear size of 21.4 mm. In the partial-repair group, a retear was identified in 28 (85%) of the 33 patients in the partial-repair group, and the mean residual defect on follow-up MRA after partial repair was reduced to 16.3 mm. The difference between the size of the retear and residual defect was significant between groups ($p = 0.001$). There were no significant differences between groups regarding the mean preoperative and postoperative fatty infiltration stage in the supraspinatus and infraspinatus muscles. At the time of the latest follow up, the mean acromiohumeral distance was significantly decreased, from 8.2 to 5.0 mm in the complete-repair group ($p < 0.001$) and 8.1 to 6.1 mm in the partial-repair group ($p < 0.001$ for both). There was also a significant difference in the final acromiohumeral distance between the groups ($p = 0.007$).

DISCUSSION AND CONCLUSION:

The purpose of this retrospective study was to assess the clinical and radiographic outcomes of large and massive rotator tears treated with arthroscopic complete repair with a posterior interval slide compared with partial repair without a posterior interval slide at a minimum follow up of 5 years. Follow-up MRA at 6 months postoperatively revealed retears in 88% of the patients in the complete-repair group. The mean retear size in the complete-repair group was significantly

larger than the mean residual defect in the partial repair group. Despite inferior structural outcomes, there were no significant differences in clinical outcomes at the time of the latest follow-up between the 2 groups, which was not consistent with our hypothesis.

On MRA during the early postoperative period, the complete repair group had an 88% retear rate, and retear sizes in that group were larger than the residual defects in the partial-repair group. Although larger retear size on MRA during the early postoperative period led to significantly reduced acromiohumeral intervals in the complete-repair group, there were no significant differences in clinical outcomes between groups at the minimum 5-year follow up. Therefore, it may be preferable to perform partial rotator cuff repair rather than aggressive release in large and massive rotator cuff tears to achieve complete repair.