

Remplissage Reduces Recurrent Instability in High-Risk Patients with “On-Track” Hill-Sachs Lesions

Background: Recent studies have shown that “on-track” shoulders with a small distance to dislocation (DTD) have high rates of recurrent instability following arthroscopic labral repair (ALR) for anterior shoulder instability. The purpose of this study was to compare recurrent instability rates and patient reported outcomes (PROs) between patients with “on-track” Hill-Sachs lesions who underwent ALR alone versus patients who had received ALR with remplissage (ALR+R). Our hypothesis was that performing a remplissage in addition to ALR would decrease the rate of recurrent instability, especially among high-risk subjects such as contact athletes with small DTD.

Methods: We performed a retrospective analysis of patients age 12-40 years old with “on-track” shoulders who underwent ALR+R between Jan 2014 and Dec 2019 at a single institution, with minimum 2-year follow-up. Exclusion criteria included: prior ipsilateral shoulder surgery, >20% glenoid bone loss (GBL), “off-track” Hill-Sachs lesion, concomitant rotator cuff repair, and connective-tissue disorder. We then identified a cohort of patients meeting the same inclusion and exclusion criteria who had undergone ALR alone. Patient age, gender, follow-up time, first-time dislocation vs. multiple dislocations, and contact sport participation were recorded. GBL, Hills-Sachs Interval (HSI), glenoid track (GT), and DTD were measured from pre-operative MRIs. The patients were then contacted to determine if they had had recurrent instability and/or revision surgery. We also obtained current Western Ontario Shoulder Instability Index (WOSI) and Single Assessment Numeric Evaluation (SANE) scores. Subgroup analysis was performed on “high-risk” patients (DTD <10mm and contact sport participation) from each cohort.

Results: The ALR+R cohort had 17 subjects and the ALR cohort had 51 subjects. There were no differences in demographic variables or GBL between cohorts ($P>0.05$). The ALR+R subjects had larger HSI ($14.7\text{mm} \pm 2.4$ vs $5.7\text{mm} \pm 5.0$; $P<0.001$) and smaller DTD ($8.2\text{mm} \pm 3.2$ vs $16.2\text{mm} \pm 5.7$; $P<0.001$). There were no difference in WOSI (304.2 ± 213 vs $302.4\text{mm} \pm 344.2$; $P=0.98$) or SANE (84.3 ± 16.6 vs 87.3 ± 8.9 ; $P=0.94$) scores between groups. Only 1 (5.9%) subject in the ALR+R cohort had a recurrent subluxation, and there were no dislocations or revision surgeries. The ALR cohort had 7 (13.7%) recurrent dislocations, 3 (5.8%) recurrent subluxations, and 6 (11.8%) revision surgeries. Univariate analysis showed that smaller DTD was predictive of recurrent instability (OR 0.88; 95% CI (0.77 – 0.99); $P=0.037$). Multivariate analysis indicated that smaller DTD (OR 0.71; 95% CI (0.56 – 0.87); $P=0.001$) and contact sport participation (OR 8.67; 95% CI (1.19 – 63.35); $P=0.033$) were associated with increased risk of recurrent instability. After adjusting for contact sport participation and DTD value, the ALR+R cohort had a 98.8% lower risk of recurrent instability compared to the ALR cohort (OR 0.012; 95% CI (0.0001 – 0.22); $P=0.003$). Among “high risk” subjects, there was only 1 (11.1%) instability event in the ALR+R group and 4 (80%) in the ALR alone group ($P=0.023$).

Conclusion: DTD calculations can be used as an independent predictor of recurrent shoulder dislocation following ALR for treatment of anterior shoulder instability. For patients with “on-track” shoulder lesions, but small DTD measurements (“near-track” lesions), remplissage is protective against recurrent instability events and need for revision surgery. This may be especially true for “high-risk” patients, such as those who participate in contact sports.