Remplissage Effects on 6-month Outcomes Following Arthroscopic Bankart Repair: A Multicenter Orthopaedic Outcomes Network (MOON) Shoulder Group Cohort Study

Travis L. Frantz, MD¹, Joshua S Everhart, MD, MPH¹, Gregory Cvetanovich, MD¹, Andrew Neviaser, MD¹, Grant L. Jones, MD¹, Carolyn M. Hettrich, MD, MPH², Brian R. Wolf, MD, MS³, MOON Shoulder Group¹, Julie Bishop, MD¹
Travis L. Frantz, MD¹, Joshua S Everhart, MD, MPH¹, Gregory Cvetanovich, MD¹, Andrew Neviaser, MD¹, Grant L. Jones, MD¹, Carolyn M. Hettrich, MD, MPH², Brian R. Wolf, MD, MS³, MOON Shoulder Group¹, Julie Bishop, MD¹

¹The Ohio State University Wexner Medical Center, Columbus, OH, USA
²Kentucky Clinic, Lexington, KY, USA
³University of Iowa Hospitals and Clinics, Iowa City, IA, USA

There are no financial conflicts to disclose for any author
Introduction

- Remplissage is utilized when performing arthroscopic stabilization procedures for recurrent shoulder instability when an engaging Hill-Sachs lesion is present (1,2)
- The belief is that the addition of this procedure will reduce recurrent instability as it will not allow future engagement of the Hill Sachs lesion with the anterior/inferior glenoid (3)
- However, there is concern that this procedure could limit external rotation and/or strength as the posterior cuff is being effectively "tethered" in the Hill Sachs lesion (4-6)
- It is unknown how the addition of remplissage to arthroscopic stabilization procedures effects outcomes at 6-months, particularly in athletes
Purpose

• Determine if there is any significant loss of range of motion (ROM) or strength at the 6-months post-op following remplissage

• If deficits are present, determine possible risk factors

• We hypothesized there would be a mild difference, but it would not be significant
Methods

• 10 participating sites in a multicenter prospective cohort study (26 sports medicine or shoulder elbow fellowship trained surgeons)

• Inclusion criteria
  – Ages 12 – 99
  – H&P consistent with anterior shoulder instability
  – Underwent arthroscopic Bankart repair with remplissage
  – Primary and revision procedures for failed prior stabilization

• Exclusion criteria
  – Concomitant rotator cuff surgery
  – Posterior or multi-directional instability
  – Worker’s compensation claims
Methods

• 38 athletes met inclusion criteria and underwent remplissage procedure
  – mean age 27.0 ± 10.2
  – 33 male, 5 female (87% male)
  – 82% >2 dislocation events in the previous year

• Compared to 104 Bankart repairs without remplissage all with at least a minimal Hill Sachs defect and were matched by:
  – Sex
  – Age within 5 years
  – Injury during sporting vs. non-sporting activity
  – Number of dislocations in the past year
  – *As remplissage is preferentially employed for large Hill Sachs defects, patients could not be matched according to humeral defect size
Results

• All Remplissage patients had a Hill Sachs defect visible at the time of arthroscopic surgery
  – 0-10% - (18% of patients)
  – 11-20% (58% of patients)
  – 21-30% (25% of patients)
  – >30% (0% of patients)

• Among matched groups, Bankart repairs with remplissage demonstrated:
  – Greater degree of humeral bone loss (p<0.001)
  – Higher likelihood of 20+ degree external rotation (ER) deficits with the elbow at 90 degrees abduction at 6 months (p<0.001)
  – Otherwise, no significant differences in any other pre-operative, intra-operative, or post-operative variables
Results

• At 6 months post-remplissage:
  – No recurrent dislocation or subluxation episode
  – No patients had anterior apprehension on physical exam
  – 26% had > 20° ER deficit with elbow at side
  – 42% had a > 20° ER deficit with elbow at 90° abduction
  – 3% had persistent weakness with external rotation
Results

- Among matched groups, remplissage...
  - Did not increase the likelihood of failing to achieve ER with elbow at side within 20° of the contralateral arm (p=0.89)

- Independent predictors of failing to meet this ROM criteria were:
  - Increased # of inferior quadrant glenoid anchors (p=0.003)
  - Increased patient age (p=0.02)
  - Pre-operative side to side deficits in ER with elbow at side (p=0.04)
Results

• Among matched groups, remplissage...
  – Did increase the likelihood of failure to achieve ER within 20° of the contralateral arm with elbow at 90° abduction (p=0.01)
• Independent predictors of failing to meet this ROM criteria were:
  – Baseline ER deficit of 20+ degrees in this position (p=0.02)
  – An increase Beighton score was protective (p=0.04)
Results

• Among matched groups, remplissage...
  – Did not increase the likelihood of having persistent ER weakness at 6 months post-surgery \( (p=0.26) \)
• The only significant independent predictor of weakness was pre-operative ER weakness \( (p=0.04) \)
Summary

• Arthroscopic Bankart repair with remplissage does not result in significant strength deficits though can lead to external rotation stiffness at 6 months, particularly with the arm in abduction, in older patients, and when anchors are used in the inferior quadrant of the glenoid.

• Future research will examine
  – Two year outcomes
  – Successful return to sport
References


