65.5% complain of decreased range of motion during throwing. The results should be considered preoperatively in remplissage candidates who are engaged in throwing sports.

Biomechanical Comparison of a Hill-Sachs Reduction Technique and Remplissage: The Potential Benefits of Anatomic Reconstruction

SS-03

April 14, 8:45 AM

Grant Garcia, M.D., Presenting Author
Ryan Degen, M.D., M.Sc., F.R.C.S.C.
Michelle McGarry, M.S.
Chris Bui, M.D.
David Altchek, M.D.
Thay Lee, Ph.D.
Joshua Dines, M.D.

Introduction: Hill-Sachs reduction represents a potential alternative treatment method to remplissage. The purpose of this study is to biomechanically compare the stabilizing effects of a Hills-Sachs reduction technique and remplissage procedure, in a complex instability model.

Methods: This was a comparative cadaveric study of 6 shoulders. For the Hills-Sachs lesion, A unique model was used to create a 30% defect, compressing the subchondral bone while preserving the articular surface in a more anatomic fashion. Also a 15% glenoid defect was made. The Hill-Sachs lesion was reduced through a lateral cortical window with a bone tamp, and the subchondral void was filled with Quickset (Arthrex) bone cement to prevent plastic deformation. Five scenarios were tested; intact specimen, bipolar lesion, Bankart repair, Remplissage with Bankart repair and Hill-Sachs reduction technique with Bankart repair. Translation, dislocation events and range motion were recorded.

Results: For all 6 specimens no dislocations occurred after either Remplissage or the reduction technique. Total translation with a 40N force at 90 degrees of external rotation (ER) was 5.1 mm following remplissage and 4.4 mm following the reduction technique, in comparison to the bipolar lesion at 11.1mm ($p<0.001$). Similarly, with a 40N force at 90 degrees of ER, total anterior-inferior translation was 5.9mm for remplissage and 4.7 mm for the reduction technique, in comparison to the bipolar lesion at 11.6 mm ($p<0.001$). Average ER for the remplissage was 125.2 degrees and 128.4 degrees for the reduction technique ($p=0.83$).

Conclusion: Similar joint stability was seen following both procedures, though remplissage had 3.2-degree loss of ER in comparison. While not statistically significant, any ER loss may be clinically detrimental in overhead athletes. Overall, the reduction technique is a more anatomic alternative to the Remplissage procedure with similar ability to prevent dislocation in a biomechanical model, making it a viable treatment option for engaging Hill-Sachs lesions.

Effect of Sagittal Rotation on Axial Glenoid Width and Version: CT Scan Analysis in the setting of Anterior Bone Loss

SS-04

April 14, 8:50 AM

Matthew Provencher, M.D., Presenting Author
Rachel Frank, M.D.
Petar Golijanin, B.S.
Bryan Vopat, M.D.
Daniel Gross, M.D.
Vidhya Chauhan, M.D.
Anthony Romeo, M.D.

Introduction: As standard 2-dimensional (2D) CT scans of the shoulder are often aligned to the body as opposed to the plane of the scapula/glenoid, the 3-dimensional (3D) anatomy of the glenoid may be distorted, and result in inaccurate measurements of glenoid width, version, and degree of GBL. The purpose of this study was to determine the effect of sagittal rotation on axial anterior-posterior (AP) glenoid width measurements in the setting of GBL.

Methods: A total of 44 CT scans from patients with a minimum of 10% anterior GBL were reformatted utilizing open-source DICOM software Osirix MD (version 2.5.1 65-bit) multi-planar reconstruction (MPR). Patients were grouped according to degree of anterior GBL: I) 10-14.9% (N=8), II) 15-19.9% (N=18), and III) >20% (N=18). The uncorrected (UCORR) and corrected (CORR) images were assessed in the axial plane at 5 standardized cuts and measured for AP glenoid width. When the measured AP width of the UCORR scan was less than that measured on the CORR scan, the AP width of the glenoid was considered underestimated, and the degree of GBL was considered overestimated.

Results: For Groups I and III, the UCORR scans underestimated the axial AP width in cuts 1 and 2, while in cuts 3-5, the axial AP width was overestimated. In Group II, the axial AP width was underestimated, while in cuts 2-5, the axial AP width was overestimated. Overall, AP glenoid width was consistently underestimated in Cut I, the most caudal cut, while AP glenoid width was consistently overestimated in cuts 3-5.

Conclusion: Uncorrected 2D CT scans inaccurately estimate glenoid width and the degree of anterior GBL and the findings of this study suggest a role for the utilization of corrected 3D reconstructions to allow more accurate measurements of the glenoid in order to accurately define the anatomy and quantity of GBL.

Critical Findings on MR-Arthrogram in Posterior Shoulder Instability Compared to an Age-Matched Controlled Cohort

SS-05

April 14, 8:55 AM

Joseph Galvin, D.O., Presenting Author
Stephen Parada, M.D.
Xinning Li, M.D.
Josef Eichinger, M.D.