**Introduction**

Ossous defects of the humeral head play a significant and well-documented role in the pathoanatomy of chronic shoulder instability. While various methods to address these lesions have been described, one potential method is the use of the HemiCAP (Arthrosurface, Inc. Franklin, MA) partial humeral head resurfacing arthroplasty (Fig. 1). The purpose of this study is to report the outcome of HemiCAP implants used for the treatment of Hill-Sachs lesions in anterior shoulder instability and for the treatment of reverse Hill-Sachs lesions in posterior shoulder instability.

**Methods**

We performed a retrospective cohort study using prospectively collected pre-operative data. Our surgical outcomes database was used to identify patients with a diagnosis of shoulder instability that underwent placement of a HemiCAP prosthesis. Patients with less than 6 months follow-up were excluded. Patients were contacted by mail and telephone to complete a brief survey and an outcomes questionnaire. Complication rates were determined including infection, reoperation, and dislocation. Statistical analysis of preoperative and postoperative outcomes scores, including the SF-12 and musculoskeletal review of systems, was performed using paired t-test with significance of 0.05.

**Results**

Twenty (20) patients meeting study criteria were identified, with a mean follow-up time of 21.5 months (range 6-49 months). 16/20 patients had undergone HemiCAP placement for a Hill-Sachs lesion in anterior shoulder instability, while 4/20 patients had undergone HemiCAP placement to address a reverse Hill-Sachs lesion.

None of the 20 patients in this study suffered a subsequent dislocation of the operative shoulder after receiving a HemiCAP implant. In the 16 patients with anterior instability, 9 (56%) reported no sensation of instability postoperatively regardless of arm position, while the remaining 7 (44%) reported some degree of instability sensation when their arm is fully extended away from their body or with overhead activities. 12/16 (75%) patients reported they felt they had full return of normal shoulder range of motion (ROM) post-operatively. 13/16 (81%) patients reported they were able to return to their previous level of activity from prior to difficulty with shoulder stability. In the patients with posterior instability, 0/4 reported any sensation of instability postoperatively despite arm position. All 4 posterior instability patients reported an ability to return to pre-injury activity level with regard to their shoulder function.

In the anterior instability patients, the post-surgical outcomes scores revealed a significant improvement in the mean musculoskeletal review of systems score of 4.07 (scale 0-10; p<0.0001) and a significant improvement in the mean SF-12 physical composite score (10.89; scale 0-100; p=0.003). Outcomes scores in reverse Hill-Sachs patients revealed similar improvements, but lacked statistical significance due to N=4.

**Discussion**

Recurrent glenohumeral joint instability has proven to be a complex and difficult problem to manage, and one in which treatment options continue to evolve. Successfully addressing the bony lesions found in patients with shoulder instability is mandatory. While surgical options for the humerus traditionally consist of bony allograft, osteotomy, or remplissage, these techniques have potential complications of disease transmission, hardware failure, and decreased range of motion, respectively.

The most significant finding of this study is the fact that none of the patients have had a repeat dislocation since undergoing a surgical stabilization procedure with a HemiCAP partial resurfacing implant. Despite the non-specific nature of the MSROS and SF-12 PCS, the significant improvement in both scores after shoulder stabilizing procedure with the HemiCAP device also provides strong evidence that patients are much less physically limited by their shoulders post-operatively.

**Conclusion**

The HemiCAP resurfacing implant is an off-the-shelf device that results in a near anatomic humeral head reconstruction and proves effective for addressing humeral head defects both in anterior and posterior shoulder instability.