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Post-Operative Complications do not Influence Patient-Reported Outcomes Following Humeral Head Resurfacing: Long-Term Follow-Up of 106 Patients

Andrea Beck, BS, UNITED STATES
Mitchell Fourman, MD, UNITED STATES
James J. Irrgang, PT, PhD, ATC, FAPTA, UNITED STATES
Albert Lin, MD, UNITED STATES

UPMC Center for Sports Medicine
Pittsburgh, PA, UNITED STATES

Summary:
Pre-operative comorbidities and post-operative complications do not influence patient-perceived satisfaction and overall success following humeral head resurfacing.

Abstract:
Introduction: Humeral head resurfacing (HHR) has emerged as an alternative to stemmed hemiarthroplasty for the treatment of isolated humeral head osteoarthritis. Benefits of HHR include maintenance of normal joint anatomy and preservation of bone stock, but there is little research evaluating its utility. Here, we investigate long-term outcomes of HHR using validated patient-reported outcome (PRO) measures. We hypothesized that patients with post-operative complications, pre-operative comorbidities and those who returned to the OR would have significantly increased pain and narcotic usage, and lower PRO scores.

Methods: A retrospective review of the electronic health record was performed for 213 patients who underwent HHR at our institution from 2000-2015. Participants filled out a questionnaire containing the American Shoulder and Elbow Society (ASES) score, the Brophy activity survey, the short-form of the Disabilities of the Arm, Shoulder and Hand (quickDASH) and general questions about shoulder function, satisfaction and demographics. Subjects were categorized into four groups: uncomplicated; required operative revision; pre-operative comorbidities (BMI = 40, Diabetes Mellitus, smoker, prior rotator cuff dysfunction, prior non-arthroplasty surgery or autoimmune/ rheumatologic disease); and post-operative complications (pain, impingement, infection or wound complications). Some patients were included in more than one group. PROs and demographic factors (age, gender, BMI, dominant vs. non-dominant operative shoulder, concentric vs. eccentric glenoid wear, income, education, heavy labor occupation and disability status) were compared between complicated and uncomplicated patients using Chi-Squared with Fisher's exact test, student's t-test or one-way analysis of variance. Significance was defined as $p < 0.05$.

Results: Survey responses were received from 106 patients (112 shoulders) for a response rate of 49.8%. Average follow-up was 5.6 ± 1.8 years. Thirty-three patients were uncomplicated, four required revision surgery, 48 had pre-operative comorbidities and 33 had post-operative complications. The proportion of heavy laborers was significantly greater in the pre-operative comorbidity (61.0%) and post-operative complication (54.5%) groups compared to uncomplicated patients (18.5%), but there were no other significant demographic differences. Pain complaints and the use of narcotic pain medication were both significantly more common in the pre-operative comorbidity (69.1%, 17.0%) and post-operative complication (87.9%, 27.3%) groups compared with uncomplicated patients (33.3%, 0.0%). Pain complaints were also significantly more common in those requiring revision surgery (100%). ASES pain and function sub-scores were significantly lower in patients with post-operative complications, although total ASES, Brophy and quickDASH scores were similar among groups. The proportion of complicated patients willing to undergo HHR again was not significantly different from uncomplicated patients. Success, defined as a self-reported subjective

shoulder value above 80% and a total satisfaction score of 4 or 5 out of 5, was similar among groups.

Conclusion: Patients who experience post-HHR complications have significantly worse pain and function, as determined by long-term ASES scores. Heavy laborers are also more likely to have a post-operative complication. However, having a post-operative complication does not impact patient-perceived satisfaction or procedure success. Patients with pre-operative comorbidities, post-operative complications and even those who require re-operation have equivocal outcomes to uncomplicated patients, indicating that HHR may be a beneficial intervention for isolated humeral head arthritis.