SH23: Does the diagnostic indication for shoulder arthroplasty affect the rate of acute post-operative PJI?

Liaison: Benjamin Zmistowski
Lead delegate: Akgün, Doruk
Supportive delegates: Hyunmin Mike Kim, Jacob Kirsch

Response: There is no data that demonstrates that diagnostic indication for primary shoulder arthroplasty is associated with acute post-operative PJI.

Strength of Recommendation: Limited

Delegate Vote: 40 (82%) agree; 1 (2%) disagrees; 8 (18%) abstain

Rationale: A comprehensive literature review was performed to identify all studies about the effects of diagnostic indication for shoulder arthroplasty on the rate of acute post-operative PJI. The primary indications for shoulder replacement surgery include acute proximal humerus fractures with or without dislocation, chronic sequelae such as nonunion, malunion, instability, or avascular necrosis, revision of failed shoulder arthroplasty or fixation of proximal humerus fractures, and rotator cuff arthropathy or massive rotator cuff tears with pseudoparalysis. Searches for the terms "Postoperative Complications", "Arthroplasty, Replacement", "Shoulder, Joint", "Osteoarthritis", "Rotator Cuff Tear Arthropathy", " Arthritis, Rheumatoid", "Arthritis, Infectious", "Arthritis, Reactive", "Osteonecrosis" were performed using the search engines PubMed and Google Scholar which were searched through September 2024. Inclusion criteria for our systematic review were all English studies (Level I-IV evidence) that reported on the effects of diagnostic indication for shoulder arthroplasty on the rate of acute post-operative PJI. Exclusion criteria were non-English language articles, nonhuman studies, retracted papers, case reports, review papers, studies with less than <10 patients in the sample size, studies without clinical follow-up/infection rates, and technique papers without patient data. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria were followed. Although we identified zero articles from PubMed and zero articles from Google Scholar that met all criteria, searches were performed broadly focusing on the clinical outcomes of shoulder arthroplasty for different diagnostic indications, excluding the rate of acute postoperative PJI. Five articles could have been identified in association with this question.

There is limited data in the shoulder literature specific to the effects of diagnostic indication for shoulder arthroplasty on the rate of acute post-operative PJI. Because of this, expert recommendations will have to be inferred from the clinical results of shoulder arthroplasty based on different diagnostic indications.

Only one study could be found in terms of inflammatory arthritis as a risk factor for postoperative infection when compared to OA as a diagnostic indication for shoulder arthroplasty. According to the retrospective study conducted by Mayfield et al. (2024), inflammatory arthritis represents a distinctly morbid risk profile compared to OA patients with multiple increased surgical and postoperative medical complications in patients undergoing ATSA and RTSA (1).

There are only four other studies in the literature which can be discussed in association with this question. Some studies about clinical results of shoulder arthroplasty based on different

diagnostic indications showed that the infection rates did not differ significantly from each other based on different diagnostic indications of shoulder arthroplasty. In the descriptive study by Franke et al. (2019), patient outcomes after revision of HA to RTSA based on initial pathology (CTA, OA, fracture) showed not significant differences in postoperative infection rates (2). Bender et al. (2020) identified primary ATSAs for instability arthropathy with a prior coracoid transfer procedure and matched them with patients with a TSA for primary OA (3). At early- to mid-term follow-up, they found no differences in infection rates between the groups (3). Moreover, the systematic review analysis conducted by Jauregui et al. (2018) focused on patients undergoing RTSA for CTA, rotator cuff tears without arthropathy, and RA and found out similar infection rates between the RA and CTA cohorts (4). Furthermore, Singh et al. (2012) used prospectively collected data on all primary TSA patients from 1976-2008 at Mayo Clinic Medical Center and found out that underlying indication for arthroplasty (RA, trauma, tumor, OA, rotator cuff disease, AVN, ankylosing spondylitis, psoriatic arthritis, gout, Charcot arthropathy, dislocation and history of septic arthritis) was not significantly associated with risk of deep PJI (5).

In aggregate, these retrospective studies show only limited evidence so that no clear statement can be made about the effects of diagnostic indication for shoulder arthroplasty on the rate of acute post-operative PJI. Longer follow-up and larger patient cohorts will provide further insights and highlight any potential differences in infection rates.

References:

1. Mayfield CK, Liu KC, Abu-Zahra MS, Bolia IK, Gamradt SC, Weber AE, et al. Shoulder arthroplasty for inflammatory arthritis is associated with higher rates of medical and surgical complications: a nationwide matched cohort analysis from 2016-2020. J Shoulder Elbow Surg. 2024;33(5):e233-e47.
2. Franke KJ, Christmas KN, Downes KL, Mighell MA, Frankle MA. Does the etiology of a failed hemiarthroplasty affect outcomes when revised to a reverse shoulder arthroplasty? J Shoulder Elbow Surg. 2020;29(7s):S149-s56.
3. Bender MJ, Morris BJ, Sheth MM, Laughlin MS, Budeyri A, Le RK, et al. Outcomes of total shoulder arthroplasty for instability arthropathy with a prior coracoid transfer procedure: a retrospective review and matched cohort. J Shoulder Elbow Surg. 2020;29(7):1316-22.
4. Jauregui JJ, Paul Hovis J, Ashfaq Hasan S. Characteristics of rheumatoid arthritis patients undergoing reverse shoulder arthroplasty. Clin Rheumatol. 2018;37(2):339-43.
5. Singh JA, Sperling JW, Schleck C, Harmsen WS, Cofield RH. Periprosthetic infections after total shoulder arthroplasty: a 33-year perspective. J Shoulder Elbow Surg. 2012;21(11):1534-41.