Shoulder Arthroplasty in Patients Younger than 50 Using Contemporary Implants Is Associated with Promising Low Revision Rates

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Introduction. The indications and accessibility of shoulder arthroplasty (SA) continue to expand, with favorable long-term outcomes. However, when critically evaluating the literature, this data is not necessarily applicable to younger patients who are likely far more active and have different goals both in the near term and regarding implant longevity. Additionally, younger patients candidates for SA are also more likely to have undergone prior procedures with altered soft tissues and osseus architecture of their shoulder. The hope is that with contemporary implants and techniques, and now that reverse arthroplasty is preferentially used in shoulders with worse pathology, the survivorship of SA in young patients is also better than in the past. The purpose of this study was to assess the survivorship as well as the complications and revisions of patients under 50 years of age who had undergone shoulder arthroplasty after 2010.

Material & Methods. Adult patients who underwent SA between 2010 and 2023 and were under the age of 50 with a minimum of 2 years of follow-up were identified within our institutional Total Joint Registry database. Our study included 172 shoulders that had undergone hemiarthroplasty (HA, n=63), anatomic shoulder arthroplasty (aTSA, n=88), or reverse shoulder arthroplasty (rTSA, n=21). There were 102 males (59%) and 70 females (41%) with a mean age of 40.8 years at the time of arthroplasty. The primary diagnosis was glenohumeral arthritis in 112 shoulders (65%), avascular necrosis in 32 (19%), inflammatory arthritis in 18 (10%), and other diagnosis (indolent infection, rotator cuff arthropathy, or locked posterior shoulder dislocations) in the remaining 10 shoulders (6%). Ninety patients (52%) had undergone at least one prior procedure on their shoulder before arthroplasty. The mean follow up was 5.6 years, and 32 patients had greater than 10 years of follow up.

Results. At most recent follow-up, the overall reoperation rate was 16.8% (n=29). Revision shoulder arthroplasty was performed in 13% (n=22), whereas 3% (n=6) had undergone an arthroscopic procedure only. An open subscapularis repair was performed on 1 patient at an outside facility. The revision rate was 22% (n=14) for hemiarthroplasty (mean time to revision 5.1 years), and 9% (n=8) for aTSA (mean time to revision 5.7 years). None of the RSA had undergone revision surgery. There were 90 patients who met inclusion criteria but had less than 2 years follow up, of which 5 patients (5%) underwent further revision procedures. Arthroscopic contracture release and/or arthroscopic biopsy was performed in 2 HAs, 4 aTSAs, and 1 rTSA. Deep infection occurred in 4 shoulders (2%) though 1 of those patients had a history of prior infection. None of the shoulders with inflammatory arthritis required reoperation or developed complications.

Discussion. Using contemporary implants and a combination of anatomic and reverse prostheses, the revision rate at 5 years of this large cohort of arthroplasties performed in patients 50 or younger was 13%. Reverse arthroplasty was used less commonly but required no revision. Hemiarthroplasty had a higher revision rate than anatomic total shoulder arthroplasty. Inflammatory arthritis was associated with no revision surgery.

Complications. No, (%)	***HA***	***TSA***	***RSA***	***Total***
	n=63	n=88	n=21	n=172
Deep Infection	2 (3)	2 (2)	0 (0)	4 (2)
Instability	0 (0)	0 (0)	0 (0)	0 (0)
Hematoma	0 (0)	0 (0)	0 (0)	0 (0)
Stiffness	1 (2)	5 (6)	0 (0)	6 (3)
Reoperations. No, (%)	15 (24)	13 (15)	1 (4)	29 (17)
Arthroscopic Release/Biopsy	2 (3)	4 (5)	1 (5)	7 (4)
Any revision	14 (22)	8 (9)	0 (0)	22 (13)
Conversion (Hemi)	0 (0)	1 (1)	0 (0)	1 (1)
Conversion (aTSA)	6 (10)	0 (0)	0 (0)	6 (3)
Conversion (rTSA)	8 (13)	5 (6)	0 (0)	13 (8)
Revision (same implant)	0 (0)	2 (2)	0 (0)	2 (1)