

# Outcomes of Revision Reverse Shoulder Arthroplasty Utilizing Femoral Head Allograft for Constrained Glenoid Defects

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## INTRODUCTION:

Revision shoulder arthroplasty in the setting of severe glenoid bone loss presents significant reconstructive challenges. The use of femoral head allograft has emerged as a potential solution to restore glenoid bone stock and provide a stable foundation for component fixation. This study evaluates the outcomes and viability of femoral head allograft in managing constrained glenoid defects during revision procedures.

**METHODS:** A retrospective review of data collected from 2008 to 2023 from a single surgeon at a single institution utilizing a single reverse total shoulder implant system using a monoblock central screw baseplate. There were 29 patients with a minimum clinical and radiographic follow-up of 2 year. All included patients underwent revision to a reverse shoulder arthroplasty with the use of bulk femoral head allograft to fill large glenoid defects. Indications for revision included failure of reverse total shoulder arthroplasty (n=3), failure of shoulder hemiarthroplasty (n=5), and failure of anatomic total shoulder arthroplasty (n=21). Patient-specific variables, radiographic parameters, and both pre- and post-operative patient outcomes (American Shoulder and Elbow Surgeons (ASES) Score, Simple Shoulder Test (SST), Visual Analog Scale (VAS) - Pain, VAS - Function, and Single Assessment Numeric Evaluation (SANE)) were collected. Descriptive statistics were utilized to analyze significant differences in the data based upon rate of secondary procedure for glenoid sided failure. Secondary outcomes included changes in patient reported outcome measures.

## RESULTS:

29 patients met inclusion criteria with a mean follow-up of 4.69 years. There were patients (3/29, 10.3%) who underwent a secondary revision operation for glenoid sided failures. One patient had early radiographic detection (15.0 months), while the other two patients had late failures (40.7 and 146.5 months). There were significant improvements in all patient-reported outcome measures between pre-operative and post-operative states ( $p < .001$ ). There were significant increases in patient forward elevation ( $p < .001$ ) and abduction ( $p < .001$ ). Internal and external rotation were not found to have significant changes post-operatively.

**DISCUSSION AND CONCLUSION:** Femoral head allograft in constrained glenoid defects during revision reverse shoulder arthroplasty results in significant increases in patient-reported outcomes with a low percentage (10.3%) of patients requiring secondary revision surgery. Half of these failures occurred within 2-years of initial surgery, while the other half occurred much later.

	Pre-Operative	Post-Operative	p-value
<u>Patient-Reported Outcomes Measure</u>			
ASES Score	31.51	68.29	<.001
SST Score	2.78	7.09	<.001
VAS - Pain	6.37	2.29	<.001
VAS - Function	3.41	7.16	<.001
SANE	32.25	70.97	<.001
<u>Range of Motion</u>			
Forward Elevation	77.10	121.91	<.001
Abduction	62.17	87.94	<.001
External Rotation	30.17	32.06	0.374
Internal Rotation (Converted)	4.80	5.47	0.059

**Table 1** – Patient-reported outcome measures and functional assessment of patient pre-operatively versus post-operatively