

#2026 - Accuracy Of Custom-Made Baseplates In Reverse Total Shoulder Arthroplasty.

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Background

Glenoid bone loss in primary and revision reverse total shoulder arthroplasty (rTSA) remains a significant challenge. Patient-specific instrumentation (PSI) has been proven to help in implant positioning, but little is known about the accuracy of personalized implants in filling massive glenoid defects.

Objectives

This study describes the accuracy of a custom-made glenoid component using patient-specific instrumentation to address the glenoid deficiency.

Study Design & Methods

Patients with glenoid bone deficiency who underwent either primary or revision rTSA were retrospectively studied for implant position accuracy. Inclusion criteria were based on the availability of postoperative CT scans. Patients with a postoperative CT scan that did not include the whole body of the scapula were excluded from the analysis. The preoperative patient's glenoid morphology was classified according to Walch classification. The Antuña classification categorized the glenoid defects in patients sustaining a revision surgery. The preoperative glenoid version was calculated using the Friedman method. The custom-made glenoid component was implanted by using a patient-specific 3D printed guide. The accuracy of the implants was studied by superposition of the preoperative plan and postoperative CT scan using a rigid registration technique on the specific software (Materialise-3Matic Medical 18.0). The study's primary outcomes were the difference in the glenoid guide pin entry point, version, and inclination of the baseplate from the preoperative plan to the postoperative implant positioning.

Results

Nine patients, consisting of five women and four men, were included in the analysis, with a mean age of 69.83 years. Most participants (7 out of 9) underwent a primary rTSA, whereas two cases involved a revision to rTSA. Among those receiving primary rTSA, 3 patients were classified as type A2 glenoid, 3 as type C glenoid, and 1 as type D according to the Walch classification. Both patients who underwent revision surgery exhibited a mild central defect as per the Antuña classification. Glenoid retroversion measurements ranged from 49° to -9° (anteversion).

The postoperative discrepancy of the central guide pin entry point from the preoperative surgical plan was 2.45 mm (range 1.05 - 6.68 mm). The version of the baseplate diverged by 3.58° (range 0.54 - 9.89°) from the preoperative plan, while the inclination of the baseplate deviated by 2.83° (range 0.29 - 7.53°).

Conclusions

The postoperative implant position reasonably matched the preoperative plan for the implant's entry point, version, and inclination. The custom-made baseplates implanted with PSI provide a solution for patients with glenoid bone loss regarding accuracy.