Patient-Specific Glenoid Guides Provide Accuracy and Reproducibility in Total Shoulder Arthroplasty

M.O. Gauci, P. Boileau, M. Baba J. Chaoui and G. Walch

Abstract and full article can be found at: https://online.boneandjoint.org.uk/doi/full/10.1302/0301-620X.98B8.37257

MANUSCRIPT ABSTRACT

Background
Patient-specific glenoid guides (PSGs) claim an improvement in accuracy and reproducibility of the positioning of components in total shoulder arthroplasty (TSA). The results have not yet been confirmed in a prospective clinical trial. Our aim was to assess whether the use of PSGs in patients with osteoarthritis of the shoulder would allow accurate and reliable implantation of the glenoid component.

Patients
A total of 17 patients (three men and 14 women) with a mean age of 71 years (53 to 81) awaiting TSA were enrolled in the study. Pre- and post-operative version and inclination of the glenoid were measured on CT scans, using 3D planning automatic software. During surgery, a congruent 3D-printed PSG was applied onto the glenoid surface, thus determining the entry point and orientation of the central guide wire used for reaming the glenoid and the introduction of the component. Manual segmentation was performed on post-operative CT scans to compare the planned and the actual position of the entry point (mm) and orientation of the component (°).

Results
The mean error in the accuracy of the entry point was -0.1 mm (standard deviation (sd) 1.4) in the horizontal plane, and 0.8 mm (sd 1.3) in the vertical plane. The mean error in the orientation of the glenoid component was 3.4° (sd 5.1°) for version and 1.8° (sd 5.3°) for inclination.

Conclusion
Pre-operative planning with automatic software and the use of PSGs provides accurate and reproducible positioning and orientation of the glenoid component in anatomical TSA.