

Radiographic performance depends on the radial glenohumeral mismatch in total shoulder arthroplasty

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BACKGROUND

Optimal radii of curvature of the articulating surfaces of the prosthetic components are factors associated with the longevity of cemented glenoid components in anatomical total shoulder arthroplasty. It was the purpose of this study, to evaluate the radiographic and clinical performance of an anatomical glenoid component of a total shoulder arthroplasty (TSA) with respect to radial mismatch of the glenoid and humeral component.

METHODS

In a retrospective study 75 TSA were analyzed for their clinical and radiographic performance with computed tomography by independent examiners using an established methodology. The study group was divided in two groups, one with mismatch < 4.5 mm (n:52) the others with mismatch ≥ 4.5 mm (n:23) and analyzed for confounding variables as indication, primary or revision surgery, age, gender, glenoid morphology and implant characteristics.

RESULTS

The mean glenohumeral radial mismatch was 3.4 mm (range 0.5-6.9). At median follow-up of 41 months (range 19-113) radiographic loosening (defined as modified Molé scores ≥ 6) was present in 7 cases (9.3%). Lucencies around the glenoid pegs (defined as modified Molé score ≥ 1) were present in 34 cases (45%). Radiolucencies were significantly associated with a radial mismatch < 4.5 mm ($p = 0.000$). The pre- to postoperative improvements in Subjective Shoulder Value and absolute Constant Score were significantly better in the group with a mismatch ≥ 4.5 mm ($p = 0.018$, $p = 0.014$).

CONCLUSION

A lower conformity of the radii of humerus and glenoid seems to improve the loosening performance in TSA. Perhaps cut-off values regarding the recommended mismatch need to be revalued in the future.

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