

FP.02.06

INFLUENCE OF DESIGN OF REVERSE SHOULDER ARTHROPLASTY ON AXIAL ROTATION: A SYSTEMATIC REVIEW

*R. Cueto*¹, *K. Hao*¹, *C. Gharby*¹, *D. Freeman*¹, *J. Werthel*², *J. King*³, *T. Wright*³, *D. Almader-douglas*⁴, *B. Schoch*⁵

¹ University of Florida, College of Medicine, Gainesville, USA

² Hôpital Ambroise-Paré, Chirurgie Orthopédique, Boulogne-billancourt, FRANCE

³ University of Florida, Department of Orthopaedic Surgery and Sports Medicine, Gainesville, USA

⁴ Mayo Clinic, Scottsdale, USA

⁵ Mayo Clinic, Department of Orthopedic Surgery, Jacksonville, USA

Background: Restoration of external and internal rotation (ER and IR) after Grammont-style reverse shoulder arthroplasty (RSA) is often unreliable. One purported solution is the use of lateralized implants. The objective of this meta-analysis was to compare axial rotation after RSA based on degree of implant lateralization.

Methods: We conducted a systematic review per PRISMA recommendations. A bibliographic search was performed for MEDLINE, Embase, Scopus, Web of Science, and Cochrane Library. Study quality was assessed per MINORS criterion. Inclusion criteria were studies evaluating axial rotation (ER, IR, or both) after RSA with a defined implant design. Our primary aim was to compare postoperative ER and IR between globally lateralized versus medialized implants after RSA. Implant classification was adopted from Werthel et al. Demographics and outcomes were reported as weighted means and pooled proportions. Meta-analysis was conducted using a random-effects model.

Results: Thirty-nine studies reporting 3,184 shoulders were included. Included patients had a weighted mean age of 72 years, mean follow-up of 48 months, minimum follow-up of 29 months (range: 21-62), and 64% were female. The subscapularis was repaired in 84% (n=2,690) shoulders; this was performed at a marginally higher rate when a lateralized implant was used (88% vs. 82%, P<0.001). Postoperative ER was reported by 97% (n=38) of studies and had a weighted mean of 30.7° (range: 9.9-47.6°). Both pre- and postoperative ER were reported by 77% (n=30); the weighted mean improvement in ER was 12.8° (range: -0.3-42°). The weighted mean improvement in ER was 14.5° for lateralized and 9.7° for medialized implants. Meta-analysis of postoperative ER was possible for 27 studies reporting 2,213 shoulders; we found significantly greater postoperative ER with a globally lateralized versus medialized implant (37°[95%CI:34-40°] vs. 26°[22-31°], P<0.001). Mean postoperative IR was reported by 54% (n=21) of studies. Mean postoperative IR achieved the minimum necessary internal rotation by 56% with lateralized (n=858, 8 studies) versus 35% (n=166, 4 studies) with medialized implants (P<0.001). Heterogeneity in reported IR prohibited quantitative analysis.

Conclusions: Lateralized RSA produces superior rotation compared to medialized designs. Standardization of IR reporting after RSA is needed for future meta-analyses.