

Operative Repair Trends for Proximal Humeral Fractures in the United States from 2010 to 2019: a Retrospective Population-Based Study

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INTRODUCTION:

Proximal humerus fractures (PHFs) are common in adults, accounting for 5% of all fractures. Most PHFs can be treated non-operatively, however, surgical interventions are indicated for displaced PHFs. The three most common techniques used to treat PHFs are reverse total shoulder arthroplasty (RTSA), shoulder hemiarthroplasty (HA), and open reduction and internal fixation (ORIF). Although these are widely accepted and prevalent procedures, there is no recent depiction of the incidence of these techniques specifically for PHFs. The purpose of this study was to assess the volume and incidence trends of RTSA, HA, and ORIF in the last decade.

METHODS:

Using IBM MarketScan® database all patients who underwent RTSA, shoulder HA, or ORIF for proximal humeral fractures from 2010 to 2019 were identified using the common Current Procedural Terminology (CPT) codes. Using International Classification of Diseases (ICD) codes, patients who underwent either of these three procedure types specifically for proximal humerus fractures were identified and included in the study. Population estimates were used to estimate the annual incidence of RTSA, shoulder HA, and ORIF for proximal humeral fractures. Case volume and incidence were estimated for gender, age subgroups, and four statistical geographical regions of the U.S. National estimates were determined with 95% confidence intervals. Absence of confidence interval overlapping between incidence values was deemed to demonstrate statistical significance.

RESULTS:

Approximately 28304 RTSAs, 8421 shoulder HAs, and 87985 ORIFs for proximal humeral fractures were identified from 2010 to 2019. During this period, the case volumes of RTSA significantly increased for PHF patients by over 300%, and that of HA significantly declined by nearly one-half (Figure 1). Across the reportable sex and age cohorts, most of the RTSA incidences of PHF patients from 2010 to 2019 significantly increased, while the incidences of patients in the HA and ORIF cohorts remained mostly unchanged (Figure 2). PHF patients who underwent RTSA demonstrated significant incidence growth in all regions except the Northeast. PHF patients who underwent ORIF demonstrated significant incidence decline in the Northeast and Midwest and significant growth in the South and West.

DISCUSSION AND CONCLUSION: Although there were threefold more ORIFs than RTSAs performed for proximal humerus fractures from 2010 to 2019, the annual incidence of RTSAs for this diagnosis has significantly risen over the decade. Improved surgeon confidence, clearer indications, implant accessibility and improved evidence may all be responsible for the increase in RTSAs being performed. Further investigation into whether this trend is unique to the diagnosis of PHF or seen in other indications for RTSA is warranted.