Geographic Travel Distance Does Not Influence Preoperative Patient Expectations or Postoperative Clinical Outcomes Following Total Shoulder Arthroplasty: A Comparative Analysis at an Urban, Tertiary Care Center

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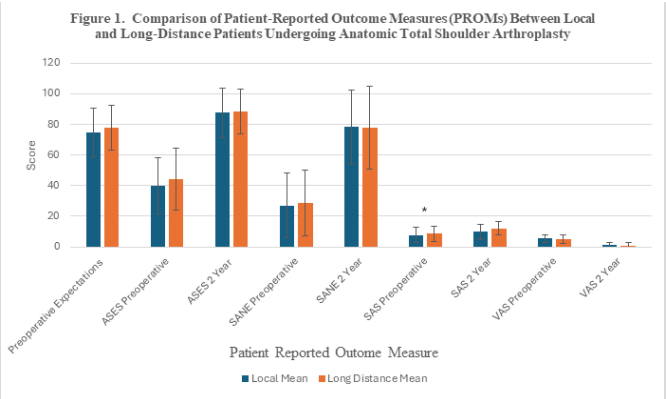
INTRODUCTION: Total shoulder arthroplasty (TSA) is increasingly performed at high-volume tertiary care centers, burdening many patients with long travel distances to receive specialized care. The impact of travel distance on patient expectations and subsequent outcomes following TSA remains unclear. This study aimed to investigate the impact of geographic travel distance on preoperative patient expectations and postoperative clinical outcomes following TSA.

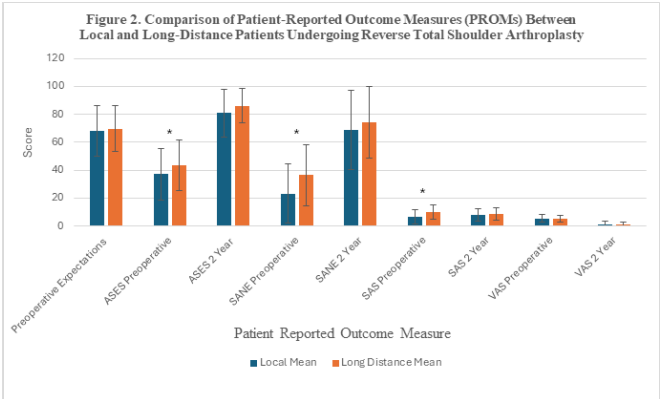
METHODS: An IRB-approved retrospective cohort analysis was performed evaluating patients undergoing anatomic TSA (aTSA) and reverse TSA (rTSA) between February 1, 2016 and May 31, 2021 at an urban, academic medical center. For both aTSA and rTSA, patients were stratified into two cohorts based on travel distance to the surgical center: local (<50 miles) or long-distance (>100 miles). Geographic travel distance was computed via Distance Matrix API (Google, 2025) by using documented residential address and the address of the medical center, where all shoulder arthroplasty procedures were performed. Patients residing 50-100 miles from the surgical center were excluded from comparative analyses in an effort to capture two geographically distinct populations and focus on long-distance patients intentionally seeking care outside of their medical community. Patients were excluded if they were indicated for any condition other than osteoarthritis or rotator cuff insufficiency or had incomplete demographic data. Preoperative expectations were evaluated via the HSS Expectations Survey (HSS-ES). Functional outcomes (ASES, SANE, SAS), and patient satisfaction were assessed at baseline and minimum two-year follow-up. Parametric test, non-parametric tests, and multivariable linear regression were used to compare patient groups for both aTSA and rTSA.

RESULTS: Among 1,406 total patients, 885 aTSA patients (local = 737; long-distance = 148) and 521 rTSA patients (local = 413; long-distance = 108) were analyzed. Among aTSA patients, long-distance patients had significantly higher education levels ($p = 0.01$) and were more likely to identify as white ($p = 0.01$). Preoperative expectations scores (HSS-ES) among aTSA patients did not differ significantly between cohorts (local: 74.87 ± 15.75, $n = 737$; long: 77.64 ± 14.70, $n = 148$; $p = 0.067$). Functional outcomes and satisfaction improved regardless of travel distance ($p>0.05$) **(Figure 1)**. The rTSA cohort, multivariable regression analysis revealed that travel distance was not a significant predictor of higher preoperative patient expectations ($p<0.05$). Clinical outcomes and satisfaction following both aTSA and rTSA demonstrated comparable and clinically meaningful improvements in both long-distance and local patient groups **(Figure 2)**. In multivariable analysis for both aTSA and rTSA, travel distance did not influence patient-related outcomes ($p>0.05$).

DISCUSSION: Patients traveling longer distances to undergo aTSA and rTSA had comparable preoperative expectations and achieved similar postoperative outcomes and satisfaction to patients residing locally. Though it has been reported that longer travel distance may result in inferior clinical outcomes for a variety of surgical procedures,[1] our study suggests that preoperative expectations and travel distance do not negatively affect postoperative outcomes following TSA. These discrepancies may be based upon regional differences in availability of surgical care within the United States, as the present study was performed in a densely populated region with a high density of orthopaedic surgeons. In this environment, long distance travel may be secondary to patient choice, as evidenced by the higher mean education level within the population of long-distance patients in our analysis. Conversely, in other areas where subspecialty orthopaedic care may be more sparse, long-distance travel may be secondary to patient need. The study findings suggest that intentional urban academic medical center selection, regardless of travel distance, does not negatively impact patient-related outcomes or satisfaction following TSA.

SIGNIFICANCE/CLINICAL RELEVANCE: Patients who traveled >100 miles for anatomic or reverse total shoulder arthroplasty had similar preoperative expectations, 2-year functional gains, and satisfaction as local patients after adjustment. This indicates that, in a dense urban market, long-distance travel doesn't compromise outcomes, supporting centralized referral to tertiary centers. Generalizability may differ in regions with limited subspecialty access.





* indicates $p<.05$