The Impact of Language on Outcomes Following Anatomic and Reverse Total Shoulder Arthroplasty

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INTRODUCTION:

Anatomic total shoulder arthroplasty (aTSA) and reverse total shoulder arthroplasty (rTSA) are common procedures used to treat diseases associated with the shoulder joint. Certain studies in orthopedic domains have suggested different perioperative outcomes for English-speaking (ES) patients compared to English-as-a-second-language (ESL) patients. This study aims to investigate the effect that preferred language has on pain and functional outcomes after total shoulder arthroplasty.

METHODS:

A retrospective chart review selected patients who underwent total shoulder arthroplasty from 2007 to 2022 for all causes beyond fracture. Information obtained included demographics, body mass index (BMI), Charlson Comorbidity Index (CCI), surgery duration, follow-up length, and postoperative outcomes. Outcomes included active forward flexion (AFF) and active external rotation (AER) range of motion (ROM) measures; visual analog scale (VAS) pain scores; American Shoulder and Elbow Surgeons (ASES) scores; duration of surgery; and readmission, mortality, and revision rates. Information was collected at preoperative, 2 month, 6 month, 1 year, 2 year, and most recent follow-up (MRF) times. After separating patients by aTSA and rTSA procedures, linear mixed effects models were applied to estimate mean difference in outcomes between ES and ESL patients while controlling for age, sex, BMI, race, and CCI.

RESULTS:

691 patients were reviewed with 259 patients receiving aTSA and 433 patients receiving rTSA with an average follow-up period of 3.85 years. Within the aTSA cohort, ESL patients had significantly lower AFF at 1 year (-49.5º, p = 0.021), 2 year (-40.0º, p = 0.007) and MRF (-35.6º, p = 0.011) time points compared to ES patients. No differences were seen with AER, pain, and functional outcomes. Within the rTSA cohort, ESL patients had significantly higher VAS pain scores (1.3, p = 0.001) and lower ASES functional scores (-9.3, p = 0.005) at preoperative evaluations, but these differences did not persist postoperatively. No differences were seen with ROM outcomes. ESL patients had a significantly higher 30 day readmission rate (p = 0.003) within the aTSA cohort. No differences in surgery duration, revision rates, readmission rates, and mortality rates were noted between ES and ESL patients in both cohorts.

DISCUSSION AND CONCLUSION:

Preferred language poses a salient impact on perioperative outcomes for shoulder arthroplasty patients. ESL correlates with lower AFF in long-term evaluations following aTSA as well as higher pain and lower functionality prior to rTSA. Although these findings do not consistently present across shoulder approaches, they nevertheless support the need for adequate language resources and culturally-competent care surrounding shoulder replacement.

Table I. Linear mixed model estimating differences in mean active forward flexion for anatomic total shoulder arthroplasty patients at multiple time periods with 95% confidence interval and p-value.

Anatomic Total Shoulder Arthroplasty Active Forward Flexion		
Time Point	ESL − ES (95% CI) (Degrees º)	P value
Pre-Operative	-9.8 (-33.7 – 14.0)	0.409
2 Months	-30.4 (-65.6 – 4.7)	0.088
6 Months	-11.6 (-41.2 – 17.9)	0.433
1 Year	-49.5 (-91.4 – -7.6)	**0.021***
2 Years	-40.0 (-68.0 – -12.1)	**0.007***
MRF	-35.6 (-62.7 – -8.4)	**0.011***
Delta (%)	-39.1 (-86.8 – 8.7)	0.107

ES: English-speaking; ESL: English-as-a-second-language; CI: Confidence Interval; MRF: Most recent follow-up; Delta: Change in value from Pre-Operative to MRF

Table II. Linear mixed model estimating differences in mean pain scores and functional scores for reverse total shoulder arthroplasty patients at multiple time periods with 95% confidence interval and p-value.

Reverse Total Shoulder Arthroplasty Reported Outcomes				
	VAS Pain Scores		ASES Functional Scores	
Time Point	ESL − ES (95% CI)	P value	ESL − ES (95% CI)	P value
Pre-Operative	1.3 (0.5 – 2.1)	**0.001***	-9.3 (-16.7 – -1.92)	**0.005***
6 Weeks	0.3 (-1.1 – 1.6)	0.697	-8.0 (-81.6 – 65.6)	0.599
3 Months	0.6 (-1.6 – 2.8)	0.524	-12.1 (-70.0 – 45.8)	0.405
6 Months	0.4 (-1.0 – 1.8)	0.602	-2.5 (-53.7 – 48.7)	0.873
1 Year	1.2 (-0.4 – 2.9)	0.134	-1.6 (-19.7 – 16.5)	0.859
2 Years	1.0 (-0.9 – 2.9)	0.303	-24.5 (-52.7 – 3.7)	0.086
MRF	0.6 (-0.6 – 1.9)	0.304	-2.9 (-16.4 – 10.6)	0.672
Delta (%)	-15.3 (-103 – 72.3)	0.705	95.2 (-137 – 328)	0.416

VAS: Visual Analog Scale; ASES: American Shoulder and Elbow Surgeons; ES: English-speaking; ESL: English-as-a-second-language; CI: Confidence Interval; MRF: Most recent follow-up; Delta: Change in value from Pre-Operative to MRF