Patient-Level Value Analysis in Reverse Total Shoulder Arthroplasty: Evaluating a One-year Episode of Care

Stephen A Doxey, Rebekah Kleinsmith, Hunter Peterson, Derek C Dixon[1], Alicia Karin Harrison[2], Thomas Ward Throckmorton[3], Tyler James Brolin[4], Brian Cunningham[5]
[1]Campbell Clinic Orthopedics, [2]University of Minnesota, [3]Campbell Clinic, [4]Univ of Tn-Campbell Clinic, [5]Methodist Hospital

INTRODUCTION:

Reverse total shoulder arthroplasty (RTSA) is becoming an increasingly common procedure performed by orthopaedic surgeons. As healthcare shifts its focus on integrating value-based care strategies, it is imperative to determine how to maximize value for a procedure. Patient-level value analysis (PLVA) is one method that has been developed to determine and evaluate value. This methodology has been employed for other orthopaedic procedures, however it has yet to be used in RTSA. The purpose of this study was to assess the one-year value of care delivery of primary RTSA and determine what characteristics affect the overall value of the procedure.

METHODS:

The study institution's patient-reported outcome measure (PROM) database was extracted for all RTSA procedures performed from 2018-2022. Any procedure that was not a unilateral primary RTSA for osteoarthritis or rotator cuff arthropathy or was missing PRO data was excluded. The main PROM used was the American Shoulder and Elbow Surgeons (ASES) score. Cost was adjusted for inflation and assessed using time-driven activity-based costing (TDABC) over the course a one-year episode of care. The primary outcome was the one-year value quotient (V_q), which is the ratio of the one-year change in ASES scores to the TDABC total cost of care. Spearman correlations, independent sample t-tests, analysis of variance (ANOVA), and linear regression analyses were conducted to evaluate characteristics that may affect the value of care delivery.

RESULTS:

A total of 123 RTSA patients met criteria for analysis. Most patients were female (n=70, 56.9%), and were on average 72±7.5 years old. All procedures were performed within an outpatient hospital setting. The overall average one-year cost of care was $21,097±4,947. Implants were the largest driver of the cost of care (49.5%) (Figure 1). Older patient age and higher ASA scores were predictive of higher costs (p<0.016). Implant company (p=0.029) was found to influence cost, while cement use (p=0.325) and subscapularis repair did not (p=0.803). In addition, those who required an inpatient stay, and were discharged to specialized nursing facility vs. home also had higher costs (p<0.001). The average one-year change in ASES was +23.8±22.6. The total cost of care did not correlate with ASES scores (r=0.04, p=1.00) (Figure 2). There were no significant predictors of ASES scores among the patient, surgical, and post-recovery characteristics.

DISCUSSION AND CONCLUSION:

With healthcare costs increasing, it is vital for healthcare systems, surgeons, and patients, to implement effective value-based care strategies. This study found that the value of care delivery and especially the cost of care is influenced by patient preoperative characteristics, implants, inpatient stay, and discharge disposition. When medically appropriate, surgeons can perform outpatient surgery at a hospital, and be mindful of discharging patients to home in order to optimize value. Surgeons and healthcare leaders can use PLVA to evaluate care at their respective institutions and maximize the value of care provided.