Utilization of Reverse Total Shoulder Arthroplasty in the Medicare Population

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Introduction: As the healthcare environment in the United States changes with the introduction of the Affordable Care Act, the availability of accurate information on allocation of healthcare resources is imperative. Historically, total shoulder arthroplasty (TSA) and reverse shoulder arthroplasty (RSA) have shared a common International Classification of Diseases (ICD) code, therefore, data on utilization of the RSA has not been obtainable. The RSA has become increasingly popular since its FDA approval in the United States in 2004, but the cost of this procedure and the number being implanted are unknown.

In a recent study by Day et al, shoulder arthroplasty rates were estimated to increase by 7% to 13% per year, which is higher than estimates for hip and knee replacements, estimated at 2.5% to 4.5% and 6% to 7%, respectively.1-3 However, it is unknown what percentage of this increase will be due to RSA compared to anatomic arthroplasty.

RSA is primarily indicated for elderly patients with irreparable rotator cuff tears, but there is increased interest in expanded indications. The purpose of this study is to examine and compare the utilization of RSA to TSA and hemi arthroplasty (SHA) in the Medicare population in the United States and to provide data on the potential impact of cost. Our hypothesis is that RSA will account for a substantial percentage of shoulder arthroplasty in the Medicare population and that the RSA will be implanted for a variety of diagnoses, in addition to cuff tear arthropathy.

Methods:
IRB approval was not required for this study.

A 100% sample of 2010 Medicare Part A claims data for patients 65 and older was analyzed to identify charges and reimbursements associated with rTSA, TSA, and SHA. Patients were identified by surgical procedure in accordance with the Ninth Revision of the International Classification of Diseases (ICD-9-CM). Patient demographics, diagnoses, provider information, reimbursement and length of stay data were also extracted from the claims data. Diagnoses were categorized into one of 9 categories based on a predetermined algorithm.

Providers were categorized by arthroplasties performed per year in Medicare patients as very low volume (1-5), low volume (6-10), moderate volume (11-20), or high volume (>20) using the unique identifier for the operating surgeon. In addition, average sale prices for TSA, SHA, and rTSA were obtained from market research data (Orthopedic Network News, Vol 22, No 1, January 2011).

Results: There were a total of 31,002 Medicare shoulder arthroplasty procedures performed in 2010. Of these, 37% were rTSAs, 42% were TSAs, and 21% were SHAs. The average length of stay for rTSA was 2.6 days. This was approximately one half day longer than the average length of stay for a TSA (2.1 days) and almost one day shorter than the average stay for a SHA (3.5 days) (p<0.001). Hospital claim payments for rTSA were $12,625, for TSA were $11,989, and for SHA were $12,958. Average sale price for rTSA, TSA and SHA were $10,108, $6,057, and $5,010 respectively.

A greater proportion of shoulder arthroplasties were performed in females: 66% of rTSAs, 58% of TSAs, and 73% of SHAs. The proportion of admissions that were classified as either emergent or urgent were 10%, 5%, and 30% for RTSA, TSA and SHA, respectively.

Osteoarthritis was the primary diagnosis code in 91% of all TSAs, 37% of all SHAa and 45% of all rTSAs. When considering primary and secondary diagnosis codes, a diagnosis of a rotator cuff tear was present in 52.8% of rTSAs, compared to 11.4% of TSAs and 15.6% of SHAs. A diagnosis corresponding to a fracture/dislocation was present in 12.9% of rTSAs, 2.1% of TSAs, and 48.0% of SHAs. Osteoarthritis was included for 93% of all TSAs, 46% of all SHAs and 59% of all rTSAs.

Very low or low volume surgeons (<10 arthroplasties/year) performed the majority of shoulder arthroplasties on Medicare patients: 57% of RTSAs, 65% of TSAs and 97% of SHAs. There were no SHAs performed by high volume surgeons, but high volume surgeons performed 22% of RTSAs and 16% of SHAs. Interestingly, 30% of RTSAs were performed by providers who performed at least 3 times as many rTSAs as TSAs and SHAs combined.

Discussion: rTSA is performed with similar frequency to TSA and almost twice as much as SHA in the Medicare population. Lower volume surgeons perform most RTSAs. A substantial number of surgeons perform more rTSAs than all anatomic shoulder arthroplasties combined. Further study of outcomes will be necessary to examine the effect of increased utilization of rTSA at the national level.

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