Superior capsular reconstruction in the active population with a massive irreparable rotator cuff tear

Emmanuel Hernandez
University of North Dakota

Follow this and additional works at: https://commons.und.edu/pas-grad-posters
Part of the Orthopedics Commons

Recommended Citation
Hernandez, Emmanuel, "Superior capsular reconstruction in the active population with a massive irreparable rotator cuff tear" (2018).
Physician Assistant Scholarly Project Posters. 13.
https://commons.und.edu/pas-grad-posters/13
Superior Capsular Reconstruction in the Active Population with a Massive Irreparable Rotator Cuff Tear

Emmanuel Hernandez PA-S
Department of Physician Assistant Studies, University of North Dakota School of Medicine & Health Sciences
Grand Forks, ND 58202-9037

Abstract
The prevalence of rotator cuff tears is a leading cause of upper extremity dysfunction, pain, and affects people across the lifespan. The primary age groups that are diagnosed include young adults as well as the elderly population. Approximately one-fifth of rotator cuff tears (RCT) are diagnosed as “massive” and prove to be difficult for orthopedic surgeons to repair. If the massive RCT is also diagnosed as “irreparable”, surgical intervention is technically difficult and can be extremely challenging. Historically, treatment options have been limited for the young population to invasive surgical intervention or conservative measures such as physical therapy and pharmacologic measures. Surgical approaches to treatment may include a reverse shoulder arthroplasty (RSA) or a superior capsular reconstruction (SCR). The purpose of this study is to determine if a superior capsular reconstruction is a better surgical alternative than a reverse shoulder arthroplasty in the young, active population with a massive irreparable rotator cuff tear. An SCR has shown successful short-term outcomes and utilizes an anatomic approach. Each surgical option is feasible; however, the postoperative functional failure is the substantial difference between either surgical technique. Research has proven the efficacy of the SCR versus the RSA. Although there is limited current evidence-based research in the field of longevity and its potential outcomes, the SCR is the leading surgical option for massive irreparable RCT repairs in the young, active population.

Introduction
Rotator cuff tears (RCT) are one of the most common upper extremity glenohumeral injuries seen in the orthopedic patient population. They are typically classified into four categories as either small, medium, large or massive. Historically, massive irreparable rotator cuff tears have had limited methods of treatment both conservatively and surgically. Interventions for massive irreparable rotator cuff tears generally consist of either a conservative course of physical therapy to strengthen the anterior deltoid, pharmacological treatment or a reverse shoulder arthroplasty (RSA). In the study, research and evidence-based practice compare the two surgical techniques, their longevity, success, complications, and postoperative requirements. Samundam, Khanna, Gu, & &Mousamay (2015), define the rotator cuff as tendons and muscles of the shoulder that provide joint stability and strength. When torn or inflamed, patients experience pain, functional disability, and extremity weakness. When the rotator cuff is diagnosed as massively torn and irreparable, surgical intervention is necessary to re-establish shoulder functionality and strength. In massive rotator cuff tears, tendons may retract from their insertion sites and pose a challenge to reinstate the tendons back to their insertion site.

Statement of the Problem
Conflict of interest arises when a young active patient endures a massive irreparable rotator cuff tear and surgical intervention is necessary for repair. A reverse shoulder arthroplasty or superior capsular reconstruction are both effective when treating rotator cuff tears. A comparative study between surgical interventions is necessary to determine success of restoration of shoulder function and overall longevity of the repair in young active individuals.

Research Question
• Is a superior capsular reconstruction a better alternative than a reverse shoulder arthroplasty in the young, active population with a massive rotator cuff tear?
• Is a reverse shoulder arthroplasty a viable option for young, active patients with massive, irreparable rotator cuff tears?

Literature Review
Research methods include systematic reviews, randomized control trials and observational studies that were performed over the past five years and obtained from PubMed and CINAHL.

Anatomy and Physiology
• The rotator cuff is comprised of four muscles and tendons that include the supraspinatus, infraspinatus, teres minor and subscapularis.
• A RCT that exceeds five centimeters in length in either direction or involves two or more tendons is typically considered massive (Ladermann et al., 2015).

Reverse Shoulder Arthroplasty
• In a reverse shoulder arthroplasty procedure, the ball and socket of the shoulder is replaced. The prosthetic ball is placed within the glenoid of the scapula. The prosthetic socket is inserted within the humeral head.
• The SCR surgery resulted in a two-fold increase in shoulder range of motion from preoperative measurements and had minimal complications (Mihata et al., 2013).

Superior Capsular Reconstruction
• The rotator cuff is significant to the restoration of strength, but function can be restored by simply reconstructing the superior capsule (Hirahara & Adams, 2015).
• Surgical criteria for the arthroscopic superior capsular reconstruction includes a massive irreparable RCT of the supraspinatus, a possible infraspinatus tear, an intact deltoid, and marginal osteoarthrosis of the glenohumeral joint (Hirahara & Adams, 2015).
• Advantages of a superior capsular reconstruction include a strong and verified repair that allows for a prompt return of range of motion and will not sacrifice any future procedures since anatomic structures remain intact.

Discussion
Through extensive research and investigation, it is apparent that the superior capsular reconstruction is the optimal treatment option when compared with the reverse shoulder arthroplasty in the young active population. Although the graft that is utilized in the SCR procedure may be costly and can be expensive, the postoperative outcomes outweigh the risks. There are more disadvantages from the RSA than there are advantages and satisfaction rates. In all studies, a significant increase in shoulder range of motion was significantly marked after a superior capsular reconstruction with a decrease in overall postoperative complications.

Applicability to Clinical Practice
Shoulder injuries are extremely prevalent and account for a majority of upper extremity injuries. They are often treated surgically and fraught with a high prevalence of massive irreparable RCTs, a solution to restore shoulder function is necessary. An RSA has been the treatment of choice in the past for individuals with massive irreparable RCTs. Although an RSA has been found to be effective in reducing pain and improving functionality, it has typically been reserved for the elderly population. An RSA is a technically invasive procedure that changes the overall anatomy and may be the last option after all other conservative options have been exhausted due to questionable longevity (Barco et al., 2016). With recent changes in orthopedic surgical techniques, the SCR is an anatomical approach for irreparable RCTs that has emerged. Using either autograft or allograft tissue, the superior capsule is reconstructed to mimic the function of the deficient rotator cuff. Early studies have shown acceptable outcomes and excellent efficacy, however due to its recent introduction an SCR procedure lacks sufficient longitudinal studies.

References

Figure 1: Right shoulder s/p SCR
Figure 2: Left shoulder s/p RSA

Alexandra Mihata, PA-C
870 Martin Street, Suite 450
Fargo, ND 58102
EMHenderson@ndsu.nodak.edu
(701) 777-2547

Figure 1: Right shoulder s/p SCR
Figure 2: Left shoulder s/p RSA

Acknowledgments
Research support was provided by the University of North Dakota Department of Physician Assistant Studies and Grand Forks Veteran Affairs Medical Center.