



Should We Repair Rotator Cuff Tears Earlier?

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According to the American Academy of Orthopaedic Surgeons,¹ between 1998 and 2004, >5 million physician visits were attributed to rotator cuff disease. Many of these problems are self-limited and include sprains, strains, and overuse. On the other end of the spectrum are degenerative large and massive full-thickness rotator cuff tears. These tears are especially prevalent in the general population older than 50 years and are associated with significant costs to society and the health care system.

Historically, many of these tears have been considered to be asymptomatic because patients often demonstrate subtle signs and symptoms. More recently, Kim et al² found that asymptomatic large and massive full-thickness tears are associated with decreased abduction strength. A multicenter prospective study by Harryman et al³ determined that the typical patient with a rotator cuff tear was only able to perform 4.4 of 12 Simple Shoulder Tests compared to normal controls.

If the definition of asymptomatic is “having no evidence of disease,” how can a weak shoulder really be considered asymptomatic? How many patients have modified their activities, work, or recreation to accommodate shoulder weakness or to avoid pain? How often have patients given a history of recurrent but only episodic shoulder symptoms and simply attributed this to the aging process?

Natural history studies of rotator cuff disease have revealed that many small tears become larger over time. Larger tears are typically associated with increased symptoms. Although conser-

vative treatment can initially improve pain, unsatisfactory outcomes with nonoperative treatment of chronic rotator cuff tears have been reported in up to 50% of patients with results deteriorating over time.⁴ Full-thickness tears rarely heal spontaneously with nonoperative treatment.

Although a rotator cuff tear isn't a life-threatening problem, it can significantly impact an individual's quality of life and work productivity. McKee and Yoo⁵ found a significant improvement in patients' general health status after rotator cuff repair. Vitale et al⁶ reported increases in “health-related quality of life” measures postoperatively. Based on the Health Utility Index and the European Quality of Life Measure, it was determined that rotator cuff repair is a highly cost-effective intervention, comparing favorably to other medical interventions including coronary artery bypass graft, medical treatment of hypertension, and hemodialysis.

Evidence-based data have consistently shown that the surgical repair of small full-thickness tears is associated with better healing, lower re-tear rates, improved patient function, and better strength in comparison to repairs of large and massive tears. With current surgical principles, postoperative imaging demonstrates an 11% to 94% rate of structural failure, with the highest percentage of failures affecting repairs of large and massive tears.^{7,8} These rates have persisted irrespective of surgical approach (eg, open, mini-open, or all arthroscopic). Techniques to augment the biology and biomechanics of the repair through growth factors, structural scaffolds, tendon transfers, and tissue engineering continue to be researched. However, the most technically proficient surgeon cannot return a fatty, atrophic, inelastic musculotendinous unit back to its normal condition. Without surgical treatment, some of these tears can become irreparable, and in the worst case scenario, the shoulder progresses to a pattern of rotator cuff arthropathy. Several studies suggest this can be prevented by surgically repairing a torn rotator cuff.

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The goals of Medicare's "pay for performance" measures and the Surgical Care Improvement Program are focused on preventing complications, readmissions, and return trips to the operating room, and on reducing length of hospital stay. The complications inherent to failed rotator cuff repairs and reverse total shoulder replacements are diametrically opposed to these cost and quality measures.

Companies such as PearlDiver have compiled orthopedic industry information from United States insurance claims data, the American Academy of Orthopaedic Surgeons, and other public sources. It is estimated that the volume of reverse total shoulder arthroplasty will grow to 30,000 by the year 2012, up from 2000 procedures in 2004 and 15,000 in 2008. In 2008, 25% of all shoulder arthroplasty procedures were reverse total shoulders, with the majority performed in patients suffering the sequelae of rotator cuff disease.⁹

According to data from the Centers for Medicare and Medicaid Services,¹⁰ it costs Medicare \$5000 to \$7000 for an arthroscopic rotator cuff repair. A reverse total shoulder arthroplasty costs approximately \$15,000 to \$17,000. These figures include payments to the hospital or surgery center, anesthesiologist, orthopedic surgeon, radiologist, imaging center, physical therapist, and medical device makers.¹⁰ According to Orthopedic Network News,¹¹ the 2009 list price of a reverse total shoulder implant ranges from \$10,500 to \$13,000, depending on the manufacturer. When expenses such as hospital staffing, maintenance, disposables, and recovery room are factored in, the Medicare reimbursement doesn't cover the cost of this procedure. It is estimated that by 2012, Medicare will be paying over \$500,000,000 for reverse shoulder arthroplasty procedures. This is the cost for the index procedure only and does not include the cost of complications.

The reverse total shoulder has been revolutionary in improving pain and function in the treatment of irreparable rotator cuff tears associated with arthritis and pseudoparalysis. However, the short- and mid-term clinical results reveal a high rate of complications, including infection, dislocation, loosening, scapular notching, and periprosthetic fractures. There have been reports of complication rates >50%, with 20% to 30% requiring a return trip to the operating room.^{12,13} A failed reverse total shoulder is a problem without a satisfactory long-term solution.

Redirecting health care dollars to preventive care (similar to scoliosis screening) to identify rotator cuff tears when they are smaller and nonretracted and before permanent neuromuscular changes develop has the potential to decrease the incidence of

large and massive tears. Not every patient with a rotator cuff tear requires surgery, as many other factors such as medical comorbidities, activity level, and work requirements will affect this decision. However, offering treatment to patients earlier in this disease process, when the tears are smaller and the biology more conducive to healing, may advance the treatment of this orthopedic disease as much as any new surgical technique or implant. Improving the quality of patient care while controlling for costs and complications are principles in line with ongoing health care reform. ■

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