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Rotator cuff surgery in patients older than 75 years with large and massive tears

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Background: The purpose of this study was to evaluate whether rotator cuff repair improves subjective and functional outcomes in patients aged ≥75 years.

Methods: From May 2005 to March 2013, 121 elderly patients who underwent rotator cuff repair for large and massive rotator cuff tears were evaluated retrospectively. Patients with an American Society of Anesthesiologists physical status classification system grade ≥4 were excluded. The patients were evaluated using visual analog scales, subjective satisfaction surveys, American Shoulder and Elbow Surgeons scores, and Constant scores. The Katz index of activity of daily living (ADL) and functional independence measure motor score were used to evaluate ADLs. Postoperative magnetic resonance imaging (MRI) was performed to investigate the structural integrity of repaired cuffs.

Results: In total, 64 patients were enrolled in the study; 80% were satisfied with their results. Visual analog scale scores improved from 6.4 to 2.3, American Shoulder and Elbow Surgeons scores from 42 to 84, and Constant scores from 42 to 76. Katz ADL scores improved from 3.4 to 5.0. Functional independence measure motor score improved from 22 to 51. Of the 64 patients, 46 underwent MRI 1 year postoperatively. Follow-up MRI revealed retears in 26% of patients. All patients with retears had improved subjective outcomes and functional scores. No patients died or experienced complications requiring intensive care or extended hospitalization.

Conclusions: Surgical treatment for large to massive rotator cuff tears in elderly patients with American Society of Anesthesiologists grade <4 provides good functional outcomes without morbidity, even in those with retears.

Level of evidence: Level IV; Case Series; Treatment Study

Keywords: Shoulder; rotator cuff tear; rotator cuff repair; retear; geriatric population; functional outcome; morbidity

Rotator cuff tears mostly occur as a result of the degenerative processes associated with aging. Burkhart and Tempelhof reported that >80% of the elderly population aged >80 years have rotator cuff tears.[4,36] With increasing life expectancies in the developed world, quality of life is an important issue in the elderly population. Rotator cuff tears

The Institutional Review Board of Asan Medical Center approved this study: AMC IRB 2014-0478.

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cause pain, weakness, and stiffness, which can reduce the patient's ability to carry out the activities of daily living (ADLs).[32] According to some studies, the quality of life of patients with rotator cuff tears is comparable to that of patients with diabetes, myocardial infarction, or congestive heart failure.[11,12,23,26] In elderly patients, rotator cuff tears are a major cause of depression because of the continuous shoulder pain and functional loss.[23] Cho et al reported close relationships between chronic shoulder pain lasting >3 months and depression, anxiety, and sleep disturbances.[6]

There is still debate concerning operative intervention for elderly patients with rotator cuff tears because of the possible complication associated with general anesthesia and the surgery itself. Thus, surgical intervention for rotator cuff tears in elderly patients can be challenging and should be approached carefully and on an individual basis.

In small tears (<1 cm),[13] the risk of tear progression is minimal and reparability is not affected even if progression occurs, and it is therefore reasonable to attempt conservative treatment first.[25] However, in tears larger than medium size (>1 cm),[13] surgical intervention is generally considered to achieve better outcomes,[33] but it is still underused in elderly patients owing to a lack of clinical evidence.[16,19,27,36,39,42]

This study was designed to evaluate the subjective and objective surgical outcomes of rotator cuff repair in patients aged ≥75 years with large to massive rotator cuff tears. We also aimed to assess the rates of morbidity and mortality associated with rotator cuff repair in this particular age group. To the best of our knowledge, research concerning this issue in this particular age group is limited. We hypothesized that with careful selection of patients using the American Society of Anesthesiologists (ASA) physical status classification system, elderly patients with large to massive rotator cuff tears can experience significant improvements in subjective and objective parameters without serious complications.

Materials and methods

We searched our operative database for patients ≥75 years old who had received rotator cuff surgery with a diagnosis of large or massive rotator cuff tears between May 2005 and March 2013. A total of 121 patients were screened.

We evaluated the patient's preoperative medical condition before surgery using the ASA physical status classification system. The ASA physical status classification system categorizes a surgical candidate's health into 6 grades of severity in ascending order[30] (Table I). If patients had any severe diseases that were poorly controlled or in the end stage (ASA physical status ≥4), they were excluded as surgical candidates. For example, unstable angina or congestive heart failure with a left ventricular ejection fraction <25%, symptomatic chronic obstructive pulmonary disease, and hepatorenal syndrome were regarded as contraindications to surgery. We corrected hemoglobin level to a minimum of 9 g/dL and albumin level to a minimum of 3.0 g/dL. In the case of medical problems such as thyroid, neurovascular, or cardiovascular diseases, we consulted the relevant medical departments before surgery. We performed surgeries after all underlying medical problems had been addressed.

Table I American Society of Anesthesiologists (ASA) grading system

Category	Description
1	Normal healthy patient
2	Mild systemic disease with no functional limitation
3	Severe systemic disease with definite functional limitation
4	Severe systemic disease that is a constant threat to life
5	Moribund patient not expected to survive 24 hours with or without surgery
6	A declared brain-dead person whose organs are being removed for donor purposes

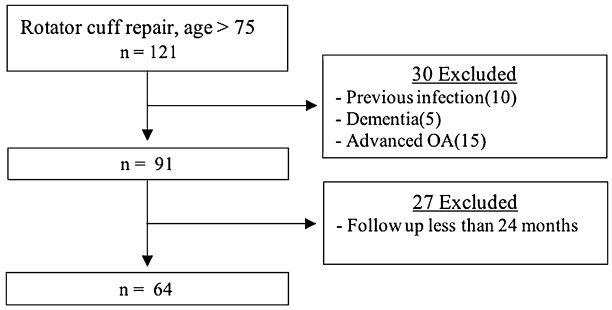

Figure 1 Flow chart for eligible patients. *OA*, osteoarthritis.

Surgical indications were (1) persistent shoulder pain and weakness unresponsive to at least 6 months of nonoperative treatment (which included anti-inflammatory medication, rehabilitation exercise, and activity modification), (2) large to massive full-thickness rotator cuff tears confirmed by magnetic resonance imaging (MRI) and physical examination, and (3) patients with ASA physical status <4 who were considered medically fit to undergo general anesthesia. The size of the rotator cuff tear was measured according to the classification of DeOrio and Cofield,[13] and the tears were categorized as either large (3-5 cm) or massive (>5 cm).

We evaluated medical records and excluded 10 patients with a history of previous shoulder infection, 5 noncooperative patients such as those with dementia, and 15 patients with advanced glenohumeral arthritis (Samilson-Prieto classification grades 2 and 3). Radiographic evaluation for glenohumeral arthritis of the shoulder was performed using the Samilson-Prieto method,[34] which is known to have excellent interobserver agreement.[2] Patients who were not followed up for at least 2 years were also excluded. Sixty-four patients were finally reviewed and analyzed (Fig. 1). Twenty-one patients were men (32.8%), and the mean age was 78.1 ± 4.2 years (range, 75-87 years). The mean postoperative follow-up period was 30.2 ± 5.2 months (range, 24-60 months). Thirty-five patients had large tears, and 29 patients had massive tears. Many patients had comorbidities, with hypertension being the most common (47 patients), followed by diabetes mellitus (31 patients), stable angina (12 patients), hypothyroidism (6 patients), and previous stroke (4 patients).

Surgical procedure and rehabilitation

All surgeries were performed by a single senior surgeon (I.-H.J.) using an open procedure with the patients in the beach chair