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CONSENSUS STATEMENT

The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation following arthroscopic rotator cuff repair

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This is a consensus statement on rehabilitation developed by the American Society of Shoulder and Elbow Therapists. The purpose of this statement is to aid clinical decision making during the rehabilitation of patients after arthroscopic rotator cuff repair. The overarching philosophy of rehabilitation is centered on the principle of the gradual application of controlled stresses to the healing rotator cuff repair with consideration of rotator cuff tear size, tissue quality, and patient variables. This statement describes a rehabilitation framework that includes a 2-week period of strict immobilization and a staged introduction of protected, passive range of motion during weeks 2-6 postoperatively, followed by restoration of active range of motion, and then progressive strengthening beginning at postoperative week 12. When appropriate, rehabilitation continues with a functional progression for return to athletic or demanding work activities. This document represents the first consensus rehabilitation statement developed by a multidisciplinary society of international rehabilitation professionals specifically for the postoperative care of patients after arthroscopic rotator cuff repair.

Level of evidence: Level V; Expert Opinion

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The dilemma after rotator cuff repair: Balancing mobility and anatomic healing

Rotator cuff tears affect approximately 30% of the population aged older than 60 years, and the rate doubles to nearly

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60% of the population by age 80 years[115]. Rotator cuff pathology results in approximately 450,000 operations per year, with the direct medical costs in the United States exceeding $7 billion per year[12,70,81,90,111,116]. Although recent studies support conservative management for symptomatic full-thickness rotator cuff tears[63], arthroscopic rotator cuff repair (RCR) for full-thickness tears has actually become more prevalent, with the rate of arthroscopic RCR increasing by 600% over the past 10 years[18]. Arthroscopic repair has replaced open surgery and now comprises greater than 95% of all RCRs in the United States[17].

Despite positive clinical results, reports of structural failure after arthroscopic RCR can range from 16%-94%[17,23,34,44,77]. Recent studies have shown that, of those patients whose repair fail to heal, greater than 98% have failure to heal within the first 6 months after repair[50,82]. For larger tears (>4 cm), failure occurs even sooner, with as many as 78% of failures occurring within the first 3 months after repair[50]. These results suggest that rotator cuff healing is protracted and that protecting the repair from excessive loading, particularly early in the rehabilitation process, is vital. Judicious use of range-of-motion (ROM) exercises is supported by a recent meta-analysis that concluded that in patients with tears >2 cm, early ROM produced a 1.4-1.9 times greater risk of failure[14]. Yet, it is still unclear if incomplete healing of the repair results in worse long-term outcomes after arthroscopic RCR[117].

Recently, there have been a number of randomized controlled trials that have attempted to clarify the role of early, protected mobilization compared with unprotected mobilization regarding structural integrity and patient outcomes[2,31,53,58,59,65,88] (Table I). The studies to date have compared a mixture of strict immobilization (6-8 weeks), protected passive range of motion (PROM), and/or early, unprotected PROM after an arthroscopic RCR. The lack of consistent timelines for immobilization, ROM restrictions, and type of RCR precludes a clear, uniform recommendation. However, in general, a period of strict immobilization with graded rehabilitation shows improved rates of anatomic healing without associated stiffness when compared with an approach of early, unprotected ROM[19,25,53,61,88]. Taken as a whole, clinical trials comparing immediate ROM versus delayed initiation and protected, early ROM until 6 weeks postoperatively have shown shoulder ROM, pain levels, and patient self-reported outcomes that are equivocal at follow-up periods of 1 year or more[2,31,53,58,59,65,88]. Although early, unrestricted initiation of exercise does produce increased ROM, with gains of 7°-15° of forward elevation (FE) and 5°-10° of external rotation (ER) at 3 and 6 months postoperatively, respectively, these relatively small differences in ROM do not seem to improve patient function even during these early time frames[14]. In addition, any stiffness that arises from protected ROM and immobilization tends to moderate by 1 year after an arthroscopic RCR[88]. Although recalcitrant postoperative stiffness is not common after RCR, there are several factors associated with persistent ROM deficits: calcific tendinitis; adhesive capsulitis; partial articular surface tendon avulsion-type RCR; concomitant labral repair; or acute, single-tendon cuff repair[25,49,62,86]. However, a recent study has suggested that even for patients with these risk factors, stiffness can be minimized with the addition of an early, protected ER but unweighted FE ROM program, without restriction is effective in avoiding detrimental stiffness (>15° loss at 1 year)[62]. The intervention, which successfully mitigated loss of postoperative ROM, was simply the addition of an unweighted table slide into FE. The table slide is an excellent choice for early mobilization because it is easy for patients to perform yet produces only low levels of supraspinatus activity[36,110]. In this document, we will suggest specific therapeutic interventions that we believe, on the basis of the best available evidence, are safe and effective for patients after arthroscopic RCR. For early, protected self-mobilization activities, such as the table slide or what we have termed the "forward bow," we believe the crucial threshold is ≤15% electromyographic (EMG) activity of the supraspinatus[69].

In this document, we suggest a 2-week period of strict immobilization and a staged introduction of protected, PROM starting at 2 weeks postoperatively, followed by restoration of active range of motion (AROM) beginning at 6 weeks, with a gradual strengthening progression beginning at postoperative week 12. We acknowledge that some surgeons and scientists believe that a 6-week period of strict immobilization is preferable. We understand the attraction of this approach, but in our opinion, there is no clear human evidence to support strict immobilization versus early, protected ROM with limits of <90° of FE and <30° of ER within the first 6 weeks. In our opinion, an across-the-board recommendation of 6 weeks of strict immobilization for all sizes and types of RCRs is unnecessary and may lead to a false sense of security. To that point, 17.3% of patients became noncompliant with rehabilitation restrictions between weeks 6-12 postoperatively when they were limited to sling immobilization and only 1 ROM exercise for the first 6 weeks postoperatively[1]. When we surveyed members of the American Society of Shoulder and Elbow Therapists (ASSET) to help define patterns of practice, 96% of respondents began passive, limited ROM within the first 3-4 weeks after RCR. Each of the randomized controlled trials we reviewed in Table I represents level I evidence, which forms the basis of our recommendation that early, protected PROM within the first 6 weeks after RCR allows for appropriate healing of the repaired rotator cuff, reduces the chances of postoperative stiffness, and communicates to patients that they are active participants in their own recovery. In our opinion, the decision to initiate ROM at 2-3 weeks versus 6 weeks postoperatively should be weighed among the patient, surgeon, and therapist as they select an approach that is in line with a given patient's situation and goals. We do recommend the more conservative approach, a 6-week period of strict immobilization with delayed start of PROM activities, if there are concerns regarding tissue healing. Gaining PROM too quickly, particularly in repairs with poor tissue quality, is thought to unduly stress the suture-tendon interface. The risks for failure after arthroscopic RCR are well documented and include larger tear size[19,82], poor tissue