Knowing the Speed Limit

Weighing the Benefits and Risks of Rehabilitation Progression After Arthroscopic Rotator Cuff Repair

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KEYWORDS

• Rotator cuff repair • Range of motion • Outcomes • Rehabilitation

KEY POINTS

- The "speed limit" for rehabilitation after rotator cuff repair is based on patient-centric factors, including tear chronicity, tissue quality, the ability to meet staged goals, and tolerance to rehabilitation stresses.
- Structural failure (nonhealing or retear) after rotator cuff repair is not uncommon (25%–60%), but is not consistently associated with worse functional outcomes.
- To provide the best environment for healing, immobilization and limited passive range of motion (ROM) should be considered during the first 6 weeks after rotator cuff repair.
- Postoperative stiffness for >6 months is not common (3%–10%), but at-risk individuals benefit from additional focus on their passive ROM earlier in the immediate postoperative period.
- Gains in ROM in accelerated programs result in moderate gains in forward elevation and external rotation ROM at 6 months, which are not likely impactful on patient function.

INTRODUCTION

Rotator cuff repairs are becoming increasingly common resulting in direct medical costs exceeding $7 billion per year in the United States.[1–4] At present, the number of rotator cuff repairs exceeds 450,000 surgeries per year with more than 95% being performed arthroscopically,[5] Studies consistently demonstrate good to excellent patient outcomes after rotator cuff repair, independent of rotator cuff integrity, at 2-year follow

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up.[6–16] These studies typically include a broadly described supervised rehabilitation protocol, which suggests that supervised therapy is an important component in the ideal treatment of rotator cuff tears.[17] Recently, a number of randomized trials, systematic reviews, and meta-analyses have examined the duration of immobilization and the initiation of range of motion (ROM) progression. Taken together, these papers suggest a period of immobilization (usually 6 weeks) and protected early ROM, followed by a systematic rehabilitation progression of active ROM, strengthening, and functional activities. This approach of protected, passive ROM concurrent with or after a period of immobilization results in similar outcomes with higher rates of structural healing compared with an approach of immediate ROM without limits.

However, these randomized, controlled trials primarily address patients with tears that are less than 3 cm, have good tissue quality, and do not have many of the factors that potentially influence functional and structural outcomes after rotator cuff repair. Functional and structural outcomes are negatively influenced by advanced age of the individual, activity level of the patient, duration of symptoms, extent of the tear, location of the tear, the number of tendons involved, rotator cuff tissue quality, atrophy of muscles, and associated shoulder pathology.[18–21] Given that these factors are not uncommon in some patients undergoing rotator cuff repair, it is confusing as to how the results of the randomized, controlled trials should be applied across the spectrum of patients after rotator cuff repair. Thus, the purpose of this paper was to link clinical rehabilitation practice with the literature and describe the factors that, in our opinion, should be considered when determining the appropriate "speed limit" of a patient-centered postoperative rehabilitation plan after rotator cuff repair.

THE CONTROVERSY

The struggle when to initiate and progress patients after rotator cuff repair is anchored by 2 seemingly opposing clinical concerns: prevention of postoperative stiffness and maintenance of structural integrity. These concerns frame the crux of the decisions when determining the rate of progression after rotator cuff repair.

1. *Structural integrity:* Arthroscopic rotator cuff repairs provide reliable satisfactory clinical outcomes despite wide ranges of structural healing from 16% to 94%.[5,8,12,22,23] The results do not seem to independently drive intermediate (1–2 years) functional outcome.[6–16]
2. *Postoperative stiffness:* Initiation of immediate (beginning the day after surgery) motion with few or no limits is thought to prevent stiffness considered to be the result of increased adhesions and scar tissue formation in the subdeltoid and subacromial spaces.[24–26] This activity is usually followed by an accelerated progression to active ROM, and resistive and functional activities, which result in an earlier return to activities.[27]

The rehabilitation clinician must weigh the benefits of early initiation (<4–6 weeks) of ROM and a faster progression through the phases of rehabilitation against the increased risks of structural failure. This decision is made in the context of the risk factors for failure as well as the risk factors for stiffness, including calcific tendonitis, adhesive capsulitis, partial articular surface tendon avulsion, type of rotator cuff repair, concomitant labral repair, or an acute, single-tendon cuff repair.[18–21]

Injury History and Prior Treatment

When planning rehabilitation after rotator cuff repair, it is important to consider the suspected underlying mechanisms of how the rotator cuff ruptured. Compressive