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## Do Short-Term Gains After Arthroscopic Superior Capsular Reconstruction Sustain Through Mid-Term Follow-Up? A Longitudinal Study with 9-Positional Strength Evaluation Stratified by Graft Healing Status

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### Introduction and Background

Arthroscopic superior capsular reconstruction (ASCR) has demonstrated favorable short-term outcomes for irreparable posterosuperior rotator cuff tears. However, functional recovery and strength restoration over time remains unclear. Furthermore, whether early improvements persist at mid-term follow-up according to graft integrity has not been fully elucidated. The purpose of this study was to evaluate whether short-term ( $\leq 2$  years) clinical and functional outcomes after ASCR are maintained at mid-term ( $\geq 3$  years) follow-up, and to determine how these longitudinal changes differ between healed and failed grafts, with emphasis on pain, range of motion, and comprehensive isometric strength recovery.

### Material and Method

A retrospective review was conducted on 49 patients who underwent ASCR between 2017 and 2023. Clinical assessments—including pain (visual analog scale), functional scores, and shoulder range of motion—were performed at both short-term and mid-term follow-up. Isometric shoulder strength was measured at each time point across nine standardized testing positions using a handheld dynamometer. Graft integrity was initially assessed on magnetic resonance imaging (MRI) at 6 months postoperatively and categorized as either healed or failed, with subsequent confirmation at mid-term follow-up using MRI or ultrasonography.

### Results

At short-term follow-up, the graft healing rate was 79.6% (39/49). No significant improvement in strength parameters was observed in either group from preoperative to short-term follow-up. Among the 34 patients available for mid-term follow-up, 25 had healed grafts and 9 had failed grafts. From short-term to mid-term, the healed group showed significant improvement in internal rotation strength at 0° and 30° of abduction and internal and external rotation strength at 90° flexion. The failed group demonstrated no significant change in any strength measure throughout the follow-up period.

### Conclusions

Meaningful strength recovery after ASCR was observed only in the healed group and required extended follow-up beyond the short-term period. Failed grafts showed no strength improvement throughout the study period.

