ABSTRACT

Background: Scapular substitution is an alteration of scapulohumeral kinematics that may occur when patients have shoulder pain or dysfunction. These abnormal scapular kinematic patterns have been recognized in patients with rotator cuff tears. It remains unknown if 1) normal scapular kinematics can be restored with rehabilitation after rotator cuff repair surgery and 2) abnormal scapular kinematics are associated with inferior patient-determined outcome scores, range of motion, or strength.

Purpose: The purpose of this study was to determine 1) if scapular substitution can be decreased or improved with rehabilitation after rotator cuff repair surgery and 2) if the presence or amount of scapular substitution was correlated with patient-determined outcome scores, range of motion, or strength after rotator cuff repair surgery.

Study Design: Retrospective review of prospectively collected data (LOE IV)

Methods: Forty-eight patients who underwent post-operative rehabilitation after an arthroscopic rotator cuff repair were reviewed for this study. The outcomes measures of interest included: patient-determined outcome scores (WORC, Simple Shoulder Test, the ASES Score, the Shoulder Activity Score, and the SANE rating), identification and quantification of scapular substitution, active range of motion, and strength. Outcomes were prospectively collected up to 12 months after surgery and assessed retrospectively.

Results: As patients progress through their first year of rehabilitation from a rotator cuff repair, the amount of scapular substitution decreases but remains statistically significantly greater than the contralateral, asymptomatic side. At all post-operative time points, patients with scapular substitution, (determined subjectively by a physical therapist), had 1) inferior WORC, ASES, SANE, and SST scores, 2) inferior flexion, abduction, and external rotation range of motion, and 3) inferior scaption strength compared to those patients without subjective scapular substitution.

Conclusions: Rehabilitation decreases but does not normalize the amount of scapular substitution up to one year after rotator cuff repair. Subjective identification of scapular substitution is associated with inferior patient-determined outcome scores, range of motion, and strength.

Level of Evidence: 4 – Prognosis study

Keywords: Patient outcomes; rotator cuff repair; scapular kinematics; scapular substitution