Significance of the Acromiohumeral Distance on Stress Radiography for Predicting Healing and Function after Arthroscopic Repair of Massive Rotator Cuff Tears (231)

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Objectives: Decreased acromiohumeral distance (AHD) is commonly detected in massive rotator cuff tears (mRCT). Most studies evaluating fixed humeral elevation have used preoperative or postoperative standardized radiography, and not stress radiography. We aimed to evaluate the role of preoperative AHD using stress radiography for healing and function after arthroscopic repair of mRCT.

Methods: We analyzed the data of 113 patients who underwent arthroscopic repair of mRCT, whose postoperative cuff integrity was evaluated using magnetic resonance imaging at 1 year and whose functions were evaluated at a mean of 34.9 ± 17.8 months. Forty-seven patients showed healing failure. Propensity score matching (1-to-1) was performed between the healed and healing failure groups. 38 patients in each group were matched in the final analysis. We defined AHD and AHD_{stress} as the shortest distances from the inferior acromion to the superior humerus on standard anteroposterior and stress radiography (5.4 kg weight applied inferiorly in a neutral position), respectively. AHD difference (AHD_{diff}) was defined as the difference between AHD and AHD_{stress}.

Results: There was no difference in the mean preoperative AHD between the healed (7.5 ± 2.0) and healing failure groups (6.9 ± 2.2 , $p = 0.234$). AHD_{diff} was significantly higher in the healed (4.4 ± 2.1 mm) than in the healing failure group (3.0 ± 2.0 mm, $p = 0.002$; cutoff, 3.2 mm). Patients with AHD_{diff} ≥ 3.2 mm showed lower healing failure (28.9% vs 71.1%, $p < 0.001$) and higher functional scores than those with AHD_{diff} < 3.2 mm. AHD_{diff} was higher in the American Shoulder and Elbow Surgeons (ASES) ≥ 80 (4.9 ± 1.9 mm) than in the ASES < 80 group (3.1 ± 2.1 mm, $p = 0.024$). Only postoperative AHD was related to postoperative functions (cutoff, 4.8 mm, $p = 0.009$) in the healing failure group.

Conclusions: The AHD_{diff} measured using preoperative stress radiography can be another predictor of rotator cuff healing and function after arthroscopic repair of mRCT and would be helpful to determine appropriate treatment strategies.

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