Tear Progression in Symptomatic Partial-Thickness Rotator Cuff Tears: Association with Initial Tear Involvement and Work Level

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INTRODUCTION:
Although the rate of tear progression is lower in partial-thickness rotator cuff tear (PTRCT) than in full-thickness rotator cuff tear (FTRCT), PTRCT often progresses to FTRCT. Thus, it is important to analyze the risk factors for tear progression to determine the proper timing of repair. However, there is a limited number of studies on factors that may affect the prognosis of PTRCT and tear progression over time.
METHODS:
Eighty-nine patients diagnosed with PTRCT through magnetic resonance imaging (MRI) who underwent conservative treatment at our institution between February 2017 and April 2021 were retrospectively reviewed. Patient factors, including stiffness, work level, and radiological factors such as the initial tear size, acromion type, and various parameters were analyzed to assess their association with tear progression. Stiffness was defined as 40°, 20°, and 5 spine level differences in forward flexion, external rotation at the side, and internal rotation to the posterior, respectively, compared to the passive range of motion (ROM) of the opposite. Work level was divided into high (heavy manual labor), medium (manual labor with less activity), and low (sedentary work activity). The type of acromion was classified according to their shape: flat, curved, hooked, and heel.
RESULTS: The mean MRI follow-up period was 22.3±17.2 (median, 16.1; range, 6.4-89.5) months, wherein tear progression (>20% increase in tear involvement) was observed in 12 patients (13.5%). In the tear progression group, tear involvement increased by 60%, while mediolateral (ML) and anterior-posterior (AP) tear sizes progressed by 1.1 mm and 1.8 mm, respectively. Univariate regression analysis showed that stiffness (P=0.031) and work level (P=0.001) were significantly associated with tear progression. Moreover, the initial tear involvement (P<0.001), ML and AP tear sizes (P<0.001 and P=0.005, respectively), and acromion type (P=0.003) were also significantly associated with tear progression. Multivariate regression analysis showed that initial tear involvement (odds ratio [OR], 1.052; 95% confidence interval [CI], 1.006−1.101; P=0.027) and high work level (OR, 15.566; 95% CI, 1.125–215.448; P=0.041) were independent risk factors for tear progression. The cutoff value for the initial tear involvement was 47.5% (sensitivity, 83.3%; specificity, 77.9%).
DISCUSSION AND CONCLUSION: Tear progression was observed in 14% of patients with PTRCT in this study. To predict tear progression, evaluating the tear involvement during the initial MRI is essential. The risk of tear progression increases with initial tear involvement >47.5% and a heavy work level.