INTRODUCTION

• The increased humeral retroversion on the dominant side in throwing athletes is thought to result from repetitive throwing motion.

• In the previous studies, the degree of increased humeral retroversion was various, suggesting that other factors may affect humeral retroversion.

• Little Leaguer’s shoulder, which is rotational stress fracture of the proximal humeral epiphysial plate, may change humeral retroversion.

OBJECTIVE

To investigate effect of Little Leaguer’s shoulder on humeral retroversion.

METHODS

• Ten high-school baseball players (average, 16.6 years; range, 16 to 18 years), who had had Little Leaguer’s shoulder during elementary or junior high schools (average, 12.6 years; range, 11 to 15 years), were enrolled in the study.

• As a control group, 22 high-school baseball players (average, 16.9 years; range, 16 to 18 years), who have never had shoulder or elbow pain, were included in this study.

• Our criteria for Little Leaguer’s shoulder were physis widening in the proximal humerus on the dominant side on plain-film radiography (Figure 1) and tenderness at the proximal physis.

• After conservative treatment (rest from playing baseball) for 2 to 3 months, the proximal physis was radiographically normal (Figure 1), symptoms of Little Leaguer’s shoulder had resolved, and all players had returned to their previous level of activity.

RESULTS

• Humeral retroversion was significantly greater on the dominant side than on the non-dominant side in both the Little Leaguer’s shoulder group (dominant, 104° ±8°; non-dominant, 84° ±12°, P < .001) and the control subjects, who had never had any shoulder or elbow injury during elementary or junior-high school (dominant, 91° ±13°; non-dominant, 81° ±10°; P < .001).

• In the dominant shoulder, humeral retroversion was significantly greater in the Little Leaguer’s shoulder group than in the control group (P = .008), but humeral retroversion in the non-dominant shoulder did not differ between these groups (P = .47).

• The side-to-side difference in humeral retroversion was significantly greater in the Little Leaguer’s shoulder group (20° ±10°) than in the control group (10° ±10°, P = .02).

• Maximal external rotation was significantly greater, and maximal internal rotation was significantly less, in the dominant shoulder than in the non-dominant shoulder in both the Little Leaguer’s shoulder group (external rotation, P = .04; internal rotation, P < .001) and the control group (P < .001 for both parameters).

• All 10 players in the Little Leaguer’s shoulder group kept playing baseball during high school. However, all of these players had shoulder pain (80%; shoulder arthritis in 7 players, partial tear of pectoralis major in 1) or elbow pain (70%; partial tear of ulnar collateral ligament in 4 players, elbow arthritis in 1, cubital tunnel syndrome in 1, and olecranon stress fracture in 1) during baseball in high school, compared with 9% with shoulder pain (2 of 22 players) and 32% with elbow pain (7 of 22 players) in the control group.

• The rates of shoulder and elbow pain were significantly higher in the Little Leaguer’s shoulder group than in the control group (P < .001 and P = .04, respectively).

CONCLUSIONS

• Humeral retroversion was increased by 10° on average in active high-school baseball players without any history of shoulder or elbow injury.

• Additional increases in humeral retroversion were present in players who had had Little Leaguer’s shoulder in elementary or junior-high school.

• The increased humeral retroversion after Little Leaguer’s shoulder may be a risk factor for future shoulder or elbow injury.