Internal rotation contracture

Abstract: Glenohumeral internal rotation deficit (GIRD) is an adaptive process in which the throwing shoulder internal rotates more than the average non-throwing shoulder. Total rotational motion of the shoulder is the sum of internal and external rotation and may be decreased in overhead athletes, such as pitchers in baseball. The purpose of this study was to determine whether a posterior capsular stretching technique performed in the abduction and external rotation (ABER) position could be a viable alternative to arthroscopic capsular release in the adolescent throwing athlete. A retrospective chart review was performed on patients between 12 and 16 years of age who underwent a posterior capsular stretching procedure for GIRD. Patients were excluded if they had previous surgery, shoulder arthroscopy, or major shoulder injury. A total of 24 patients met the inclusion criteria. The mean age was 14.0 years (range, 12.0 to 15.9 years) and the mean follow-up was 24.8 months (range, 6 to 58 months). Two groups were determined based on the treatment method. Group 1 consisted of patients who underwent the posterior stretching technique in the ABER position (n = 12); group 2 consisted of the patients who underwent capsular release in the ABER position (n = 12). The primary outcome measure was the shoulder abduction and external rotation (ER) range of motion. A difference of 30° or more in the pre- and postoperative values between the involved and the noninvolved shoulder was defined as a clinically significant improvement. The mean preoperative abduction and ER range of motion was 165.9° ± 12.3° for group 1 and 169.3° ± 15.5° for group 2 (p = 0.26). The mean postoperative abduction and ER range of motion was 195.1° ± 11.9° for group 1 and 194.8° ± 16.3° for group 2 (p = 0.26). The results of this study demonstrated that the posterior stretching technique performed in the ABER position may be a viable alternative to capsular release and may offer an easier and less invasive procedure. In addition, the procedure may have long-term benefits with regard to clinical and radiographic findings, specifically acromion impingement.

Introduction

The throwing athlete is at risk for developing Glenohumeral Internal Rotation Deficit (GIRD), which is defined as the inability to externally rotate the shoulder more than 30° with the arm in 90° of abduction and 90° of forward flexion. GIRD is an adaptive response to the biomechanics of throwing and is present in both young and adult baseball pitchers. Over time, this deficit can lead to decreased total shoulder motion and eventual rotator cuff tears. Additionally, GIRD can lead to a variety of other shoulder pathologies, including anterior impingement, impingement syndrome, supraspinatus tendinopathy, and labral tears. Anatomically, GIRD can be multifactorial, with poor development of the posterior capsule, posterior shoulder laxity, anterior inferior Glenohumeral instability, and scapular dyskinesis contributing to the development of GIRD. The throwing athlete is at risk for developing GIRD due to the repetitive throwing motion, which places stress on the shoulder joint and surrounding structures. This stress can lead to the development of GIRD, which can result in decreased total shoulder motion and eventual rotator cuff tears. Additionally, GIRD can lead to a variety of other shoulder pathologies, including anterior impingement, impingement syndrome, supraspinatus tendinopathy, and labral tears. Anatomically, GIRD can be multifactorial, with poor development of the posterior capsule, posterior shoulder laxity, anterior inferior Glenohumeral instability, and scapular dyskinesis contributing to the development of GIRD.

Methods

A retrospective review of the charts of patients between 12 and 16 years of age who underwent a posterior stretching procedure for GIRD was performed. Patients were excluded if they had previous surgery, shoulder arthroscopy, or major shoulder injury. A total of 24 patients met the inclusion criteria. The mean age was 14.0 years (range, 12.0 to 15.9 years) and the mean follow-up was 24.8 months (range, 6 to 58 months). Two groups were determined based on the treatment method. Group 1 consisted of patients who underwent the posterior stretching technique in the ABER position (n = 12); group 2 consisted of the patients who underwent capsular release in the ABER position (n = 12). The primary outcome measure was the shoulder abduction and external rotation (ER) range of motion. A difference of 30° or more in the pre- and postoperative values between the involved and the noninvolved shoulder was defined as a clinically significant improvement. The mean preoperative abduction and ER range of motion was 165.9° ± 12.3° for group 1 and 169.3° ± 15.5° for group 2 (p = 0.26). The mean postoperative abduction and ER range of motion was 195.1° ± 11.9° for group 1 and 194.8° ± 16.3° for group 2 (p = 0.26). The results of this study demonstrated that the posterior stretching technique performed in the ABER position may be a viable alternative to capsular release and may offer an easier and less invasive procedure. In addition, the procedure may have long-term benefits with regard to clinical and radiographic findings, specifically acromion impingement.

Results

The mean preoperative abduction and ER range of motion was 165.9° ± 12.3° for group 1 and 169.3° ± 15.5° for group 2 (p = 0.26). The mean postoperative abduction and ER range of motion was 195.1° ± 11.9° for group 1 and 194.8° ± 16.3° for group 2 (p = 0.26).

Discussion

The results of this study demonstrated that the posterior stretching technique performed in the ABER position may be a viable alternative to capsular release and may offer an easier and less invasive procedure. In addition, the procedure may have long-term benefits with regard to clinical and radiographic findings, specifically acromion impingement.

Conclusion

The posterior stretching technique performed in the ABER position may be a viable alternative to capsular release and may offer an easier and less invasive procedure. In addition, the procedure may have long-term benefits with regard to clinical and radiographic findings, specifically acromion impingement.