

Case Report

Arthroscopic posterior-inferior capsular release in the treatment of overhead athlete with GHIRD: a case report

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ABSTRACT

Glenohumeral internal rotation deficit (GHIRD) is one of most controversial joint diseases in terms of diagnosis and treatment. The use of arthroscopy has improved the recognition of pathologic findings in glenohumeral internal rotation deficit (GHIRD) and allowed a better understanding of the etiology of it and the correlation between symptoms and lesion patterns. We present our technique for arthroscopic posterior-inferior capsular release in athlete with symptomatic glenohumeral internal rotation deficit (GIRD) that was unresponsive to nonoperative treatment and was preventing him from returning to sport. By this technique resulted in a successful outcome. We evaluate a 28 years old male with right shoulder pain and limitation in abduction internanal rotation after 3 months conservative treatment. We performed Arthroscopic posterior-inferior capsular release. After 2 months correspondingly, we performed follow-up assessments on shoulder function (using the ases and rowe score) and pain (using a visual analogue scale) were made. Arthroscopic posterior-inferior capsular release can be recommended as a reasonable operative solution for overhead athletes with symptomatic GIRD that has not responden to conservative management. Evaluation of patient in whom we performed arthroscopic repair base on ases and rowe score. Arthroscopic posterior-inferior capsular release showed satisfactory shoulder function after 2 months follow up correspondingly.

Keywords: Arthroscopic, Athlete, GHIRD, Posterior-inferior capsular

INTRODUCTION

Glenohumeral internal rotation deficit (GHIRD) is one of most controversial joint diseases in terms of diagnosis and treatment. The use of arthroscopy has improved the recognition of pathologic findings in glenohumeral internal rotation deficit (GHIRD) and allowed a better understanding of the etiology of it and the correlation between symptoms and lesion patterns. It can be observed in overhead athletes and is thought to play a role in generating pain and rotator cuff weakness in the

dominant shoulder with sport. It is unclear what is an acceptable value of GIRD in a population of overhead athletes and whether it should be based solely on internal rotation deficit or should include total range of motion (ROM) deficit.^{1,2}

Acquired GHIRD in the athlete's throwing shoulder has been thoroughly documented in the literature as a loss of internal rotation relative to the non-throwing shoulder, with etiologies including bony adaptations (increased humeral retroversion), muscular tightness, and posterior

capsular tightness. In particular, the repetitive torsional stresses acting on the throwing shoulder of volleyball players is thought to produce, over the long term, structural adaptations such as increased humeral retroversion.^{3,4}

GHIRD has been associated with a variety of pathologic conditions, including scapular dyskinesis, internal and secondary impingement, partial articular-sided rotator cuff tears, damage to the biceps-labral complex, and ulnar collateral ligament insufficiency. Restriction from engaging in exacerbating activities (e.g., throwing) and compliance with a specific stretching program reduces or eliminates GHIRD in the majority of cases. In the few cases in which conservative management fails, operative intervention may be indicated. Few investigators have indicated a detailed operative technique for selective arthroscopic capsular release of the posterior-inferior capsule or evaluated the ability of athletes to return to sport after such surgery.^{1,5,6}

We present our technique for arthroscopic posterior-inferior capsular release in athlete with symptomatic glenohumeral internal rotation deficit (GIRD) that was unresponsive to non-operative treatment and was preventing him from returning to sport. By this technique resulted in a successful outcome.⁷⁻⁹

CASE REPORT

Authors evaluate a 28 years old male with right shoulder pain and limitation in abduction internal rotation after 3 months conservative treatment. Authors performed Arthroscopic posterior-inferior capsular release. After 2 months correspondingly, authors performed follow-up assessments on shoulder function (using the aces and Rowe score) and pain (using a visual analogue scale) were made.

Assessment

Authors used a bubble goniometer to measure passive internal rotation. Patients were positioned supine with 90° of thoracolumbar abduction and 90° of elbow flexion. The examiner's hand stabilized the scapula against the examination table, in accordance with published techniques. Active internal rotation was measured at 0° of thoracolumbar abduction by noting the most superior spinal segment reached. Before and after surgery, passive internal rotation measurements were taken on both arms. GIRD was determined by the difference between dominant and non-dominant arm measurements; segmental differences were obtained by subtracting segments achieved between the dominant and non-dominant arms.

Before surgery and at minimum 2-year follow-up after surgery, patients completed a subjective questionnaire, which included the American Shoulder and Elbow Surgeons (ASES) Standardized Shoulder Assessment

Form, for assessment of both arms and Rowe Score. ASES scores are reliable, valid, and responsive in evaluating shoulder pain and function. Patients also answered questions about their ability to return to play, their level of play after surgery, and whether they would undergo the procedure again (Figure 1).

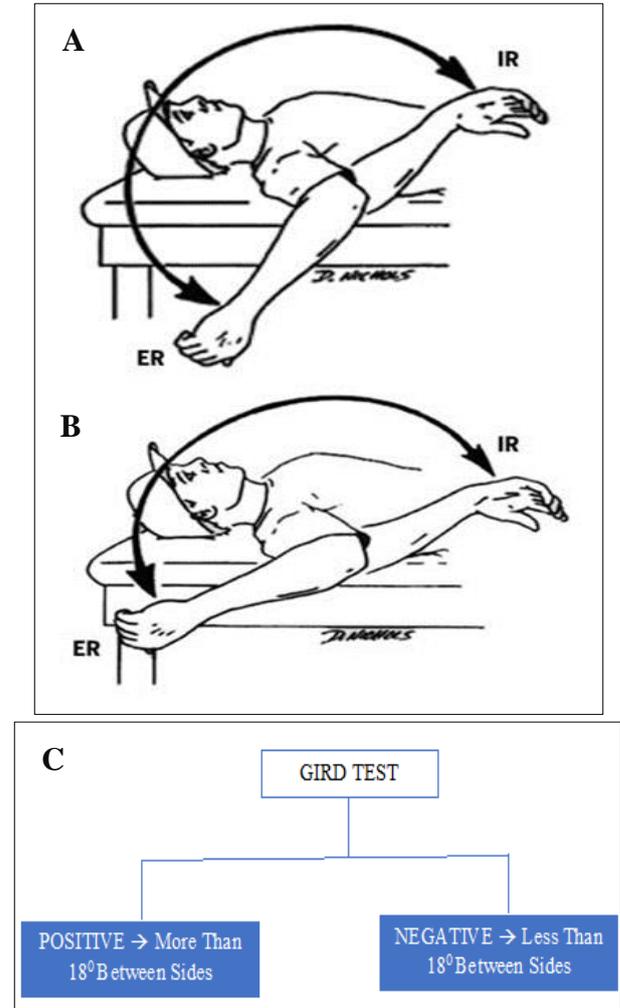


Figure 1: The total-rotational-motion concept. (A) External rotation (ER) + internal rotation (IR) = total motion. (B) internal rotation (IR + External rotation (ER) = total motion. Total rotational motion is equal bilaterally. (C) Interpretation for GIRD Test.

Surgical technique

After induction of general anesthesia and standard preparation and draping, the patient is placed in a standard Supine position and examined. Diagnostic arthroscopy is then performed. In this patient, intra-articular evaluation revealed a thickened, contracted posterior band of the Inferior glenohumeral ligament. This finding is consistent with other studies of patients with significant GHIRD. On completion of the diagnostic portion of the arthroscopy, attention is turned to the selective posterior-inferior capsular release. Key to proper execution of the release is establishing a posterior-

inferior accessory portal. This is accomplished while viewing from a standard posterior (“soft spot”) portal and determining the appropriate location and angle of entry by spinal needle localization. Typically, an entry point is selected about 4 cm distal and 1cm lateral to the standard posterior portal. An 18-gauge spinal needle introduced at this location is angled about 15° superiorly and about 20° medially. Once the appropriate vector is determined, a skin incision is made, and a Wissinger rod is introduced, over which a small-diameter cannula is passed. A hooked-tip electrocautery device is used to divide the posterior capsule from the glenoid labrum between the 8- and 6-o’clock positions in the right shoulder

Durante operation

Care is taken to perform the release immediately adjacent to the glenoid labrum and using short bursts of cautery in order to minimize risk of injury to the teres minor branch of the axillary nerve. Adequate release is confirmed by reassessing passive internal rotation under anesthesia. Additional procedures are performed, if necessary, after completion of the capsular release (Figure 2).

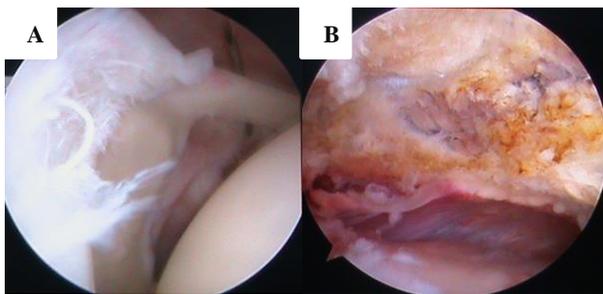


Figure 2: Intraoperative arthroscopic image of posterior-inferior capsular release. (A). Anatomy of intraarticular (B). Pathological finding in the arthroscopic.

Postoperative

Rehabilitation consists initially of pendulum exercises and scapular retraction starting on postoperative Day 1. Once the swelling from the surgical procedure subsides, typically within 1 week, passive and active-assisted ROM and gentle posterior capsular mobilization are initiated under the direction of a licensed physical therapist. Active ROM is allowed once the patient regains normal scapulothoracic rhythm. The ASES score is affirmative 90 and ROWE score is 87 due to his activities.

Strengthening

Consists initially of isometrics followed by light resistance strengthening for the rotator cuff and scapular stabilizers once active ROM and scapulothoracic rhythm return to normal. Passive internal rotation stretching, including use of the sleeper stretch, is implemented as

soon as tolerated and continues throughout the rehabilitation process

DISCUSSION

The overhead throwing motion is a highly skilled movement performed at extremely high velocity, which requires flexibility, muscular strength, coordination, synchronicity, and neuromuscular control. The throwing motion generates extraordinary demands on the shoulder joint. It is because of these high forces, which are repetitively applied, that the shoulder is the most commonly injured joint in professional volleyball players.¹⁰⁻¹²

The overhead throwing motion is an extremely skillful and intricate movement. When pitching, the overhead throwing athlete places extraordinary demands on the shoulder complex subsequent to the tremendous forces that are generated. The thrower’s shoulder must be lax enough clinical examination and accurate diagnosis. Rehabilitation follows a structured, multiphase approach, with emphasis on controlling inflammation, restoring muscles’ balance, improving soft tissue flexibility, enhancing proprioception and neuromuscular control, and efficiently returning the athlete to competitive throwing.^{13,14}

It is important for the clinician to realize and appreciate the “typical” physical characteristics of the over-head thrower to allow excessive external rotation but stable enough to prevent symptomatic humeral head subluxations, thus requiring a delicate balance between mobility and functional stability. Authors refer to this as the “thrower’s paradox.” This balance is frequently compromised and believed to lead to various types of injuries to the surrounding tissues. Frequently, injuries can be successfully treated with a well-structured and carefully implemented.¹⁵⁻¹⁷

Non-operative rehabilitation program. Athletes often exhibit numerous adaptive changes that develop from the repetitive microtraumatic stresses occurring during overhead throwing. Treatment should include the restoration of these adaptations. Arthroscopic posterior-inferior capsular release can be recommended as a reasonable operative solution for overhead athletes with symptomatic GIRD that has not responded to conservative management.^{18,19}

Arthroscopic posterior-inferior capsular release showed satisfactory shoulder function after 2 months follow up correspondingly.²⁰

CONCLUSION

The clinical evaluation of shoulder injuries in the throwing athlete requires a thorough understanding of the biomechanics and phases of throwing. Through careful evaluation of the thrower’s mechanics and physical

examination findings, the clinician can begin to form a differential diagnosis based on typical patterns of injuries observed in athletes. The clinician must understand the common presentations of various shoulder disorders while keeping in mind that pathology often coexists.

Treatment of shoulder disorders in the throwing athlete is directed at restoring the proper balance between strength, mobility, and stability. Treatment should often start with conservative measures before surgical intervention, with the Selective arthroscopic posterior-inferior capsular release can be recommended as a reasonable operative solution for overhead athletes with symptomatic GIRD that has not responded to conservative management. Many studies have reported the result of arthroscopic posterior-inferior capsular of the shoulder. Evaluation of patient in whom authors performed arthroscopic posterior-inferior capsular release showed satisfactory with clinically there is no range of motion internal rotation deficit and excellent functional status base on ASES and Rowe score.

In the present study, ASES scores improved significantly, and our athlete-patient returned to Sport at his preoperative level of play or a higher level.

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