

Shoulder Injuries in Cricketers

¹Sharad Prabhakar, ²Radhakant Pandey

ABSTRACT

Shoulder injuries are very common in cricketers. Throwing athletes in cricket (both bowlers and fielders) are prone to shoulder injuries secondary to the large amount of forces generated, the resultant very high velocities and the repetitive nature of the throwing action. The shoulder joint has to balance mobility vs stability. Athletes exhibit adaptive changes that develop from the repetitive microtrauma following overhead throwing. The article discusses in detail how altered scapular kinematics, rotator cuff dysfunction with altered muscle strength patterns, internal impingement combined with anatomical adaptive bony and soft tissue changes causing a glenohumeral internal rotation deficit, predispose the cricketer to shoulder injury.

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INTRODUCTION

Shoulder injuries are very common in cricketers. The Australian Cricket Board reported that up to 5% of the injuries among first-class cricketers during the 2001 to 2002 season affected the shoulder.¹ Another recent Australian injury survey over 11 seasons found that shoulder injuries account for up to 1.4% of all injuries per season.² It has been hypothesized that this is an underestimation of a much larger problem.³ A study describing the impact of shoulder injuries on the 2005 England and Wales first class cricket season described 23% of the players as having a shoulder injury with 1.7% not being available for selection.⁴

Shoulder has very little intrinsic bony stability it is like a basket ball on a saucer (shallow glenoid). It is reliant on static and dynamic restraints.

Static restraints: Labrum-forms 50% of glenoid depth, joint capsule, ligaments-superior, middle and inferior glenohumeral ligaments.

Dynamic restraints: Include rotator cuff muscles, negative intra-articular pressure.

Shoulder Kinematics

The throwing 'kinetic chain' involves a coordinated motion which progresses from toes to fingertips. Throwing athletes in cricket (both bowlers and fielders) are prone to shoulder injuries secondary to the large amount of forces generated, the resultant high velocities and the repetitive nature of the throwing action.⁵ Energy generated from lower body is transmitted to the scapula then to the arm then hand and subsequently to the ball. Any condition that alters the components of kinetic chain may result in dysfunctional/painful shoulder.

The shoulder joint has to balance mobility vs stability (Thrower's Paradox).⁶ It has to be mobile enough to reach extreme external rotation to impart velocity to the ball, at the same time remain stable with humeral head centered in glenoid providing a stable fulcrum for rotation. Repetitive high velocity throwing can alter mobility-stability relationship leading to a painful shoulder. Different injuries manifest in different phases of throwing hence it is important to determine in which phase the pain occurs.

Athletes exhibit adaptive changes that develop from the repetitive microtrauma following overhead throwing.⁶ The arc of motion of the dominant arm of an asymptomatic elite-level throwing athlete typically is shifted posteriorly, with increased external rotation and decreased internal rotation of the abducted shoulder.⁵ It is theorized that the combined effect of adaptive increased humerus retroversion with soft tissue adaptation contributes to the internal rotation deficit. This includes stretching of the anterior joint capsule over time and tightening of the posterior capsule-ligamentous-muscular complex, leading to decreased internal rotation and increased external rotation.⁷ Altered scapular kinematics, rotator cuff dysfunction with altered muscle strength patterns, internal impingement combined with anatomical adaptive bony and soft tissue changes causing a glenohumeral internal rotation deficit, predispose the cricketer to shoulder injury.³

¹Assistant Professor, ²Consultant

¹Department of Orthopedics, Postgraduate Institute of Medical Education and Research, Chandigarh, India

²Department of Trauma and Orthopedics, University Hospitals of Leicester, Leicester, United Kingdom

Corresponding Author: Radhakant Pandey, Consultant Department of Trauma and Orthopedics, University Hospitals of Leicester, Leicester, United Kingdom, Phone: +7990598125 e-mail: montypandey@hotmail.com

Common Causes of Shoulder Pain in Cricketers

Micro instability/subtle instability: Neer described the development of laxity in the shoulder of an overhead-throwing athlete as an acquired type of laxity, a condition distinct from either traumatic or nontraumatic instability and theorized that this acquired laxity resulted from repetitive injury and microtrauma.⁸ A sulcus sign may even be positive.

Superior labrum anterior-posterior (SLAP) tear: Burkhart and Morgan⁹ stated that SLAP lesions in throwers occur by a 'peel-back' mechanism, which is defined as an increased strain at the biceps anchor during the late cocking phase at maximum external rotation. This causes vague pain at the posterosuperior joint line and may manifest as locking or snapping, depending upon the extent of the tear. Typically there is pain and loss of velocity in the cocking phase. The treatment is arthroscopic debridement and stabilization of high grade lesions while taking care not to lose external rotation.

Rotator cuff tears: Partial-Noffal¹⁰ proposed that the internal rotator cuff muscles act concentrically during the acceleration phase of the throw, and the external rotator cuff muscles act eccentrically during the deceleration phase. The external rotator cuff muscles have the dual task of decelerating the arm and, at the same time, maintaining dynamic stabilization of the glenohumeral joint. Muscular dysfunction from pain or delayed activation patterns could lead to shoulder injuries. Partial thickness, articular-sided rotator cuff tears are found posterosuperiorly, at the junction of the infraspinatus and supraspinatus tendon insertions while full thickness tears are uncommon. Treatment includes initial physical therapy followed by arthroscopic debridement or repair for a larger tear. However, only 50% are able to return to their preinjury levels.¹¹

Impingement: In the older athlete with a stable shoulder, there is loss of internal rotation without a corresponding increase in external rotation. In addition, superior migration of the humeral head may occur following cuff fatigue and cause classical 'outlet or external' impingement. The treatment includes local injection with arthroscopic subacromial decompression if required.⁵ In younger athletes with capsular contracture, dynamic secondary 'internal' impingement occurs due to excessive anterosuperior translation of the humeral head. This is also exacerbated by scapular dyskinesia.⁵ Treatment requires rehabilitation to improve the mechanics of throwing, a core strengthening program, and scapular kinetic stabilizer strengthening. Posterior glenohumeral tightness should be assessed and addressed with a specific stretching regimen. The goals of operative treatment if required are

to repair the superior aspect of the labrum if it is detached, debride partial-thickness cuff tears and reduce the laxity in the antero-inferior glenohumeral ligament.⁵

Glenohumeral internal rotation deficit (GIRD): The development of a posterior capsular contracture in the throwing athlete shifts the contact point of the humerus on the glenoid posterosuperiorly. This results in a functional increase in the length of the anterior capsule and excessive external rotation. It has been suggested that an athlete has clinically relevant glenohumeral internal rotation deficit if there is a loss of more than 250 of internal rotation when compared to the nonthrowing side. Most of the athletes respond to exercises that focus on posterior capsule stretching. The older athlete may require arthroscopic postero-inferior capsulotomy.⁵

Dyskinesia: Scapular dyskinesia has been associated with anterior instability. Loss of function due to weakness or fatigue leads to glenohumeral hyperangulation with a relative increase in glenoid anteversion, placing the anterior capsular structures under strain. Furthermore, the scapula may impinge on the thorax during the late cocking phase.¹² Players usually respond well to physical therapy programs strengthening the scapular stabilizers.

To summarize, the mechanisms of throwing injuries in athletes are becoming well defined. A complete understanding of the adaptive changes occurring in the young throwing athlete enables institution of appropriate rehabilitation protocols with a combined strengthening-stretching regimen to ensure optimal performance and to avoid potentially career ending shoulder injuries.

REFERENCES

1. Orchard J, James T, Alcott E, Carter S, Farhart P. Injuries in Australian cricket at first class level 1995/1996 to 2000/2001. *Br J Sports Med* 2002 Aug;36(4):270-274.
2. Orchard JW, James T, Portus MR. Injuries to elite male cricketers in Australia over a 10-year period. *J Sci Med Sport* 2006 Dec;9(6):459-467.
3. Arora M, Shetty SH, Dhillon MS. The shoulder in cricket: What's causing all the painful shoulders? *J Arthroscopy and Joint Surg* 2015;2(2):57-61.
4. Ranson C, Gregory PL. Shoulder injury in professional cricketers. *Phys Ther Sport Off J Assoc Chart Physiother Sports Med* 2008 Feb;9(1):34-39.
5. Braun S, Kokmeyer D, Millet P. Shoulder injuries in the throwing athlete. *J Bone Joint Surg Am* 2009 Apr;91(4):966-978.
6. Wilk KE, Meister K, Andrews JR. Current concepts in the rehabilitation of the overhead throwing athlete. *Am J Sports Med* 2002 Jan-Feb;30(1):136-151.
7. Borsa PA, Dover GC, Wilk KE, Reinold MM. Glenohumeral range of motion and stiffness in professional baseball pitchers. *Med Sci Sports Exerc* 2006 Jan;38(1):21-26.
8. Neer CS 2nd. *Shoulder reconstruction*. Philadelphia: WB Saunders; 1990;143-271.

9. Burkhart SS, Morgan CD. The peel-back mechanism: its role in producing and extending posterior type II SLAP lesions and its effect on SLAP repair rehabilitation. *Arthroscopy* 1998 Sep;14(6):637-640.
10. Noffal GJ. Isokinetic eccentric-to-concentric strength ratios of the shoulder rotator muscles in throwers and nonthrowers. *Am J Sports Med* 2003 Jul-Aug;31(4):537-541.
11. Tibone JE, Elrod B, Jobe FW, Kerlan RK, Carter VS, Shields CL Jr, Lombardo SJ, Yocum L. Surgical treatment of tears of the rotator cuff in athletes. *J Bone Joint Surg Am* 1986 Jul;68(6):887-891.
12. Lehtinen JT, Tetreault P, Warner JJ. Arthroscopic management of painful and stiff scapulothoracic articulation. *Arthroscopy* 2003 Apr;19(4):E28.