Rare Complex Posterior Glenohumeral Injury: A Case Report

Karla Margetic¹, Dijana Zadravec²,³, Mia Smoljan²,³ and Petra Margetic²,³*

¹Health Center Zagreb - Centre, Zagreb, Croatia
²University Hospital "Sisters of Mercy", Zagreb, Croatia
³School of Dental Medicine, University of Zagreb, Zagreb, Croatia

*Corresponding Author: Petra Margetic, RTG Department, University Hospital "Sisters of Mercy", Zagreb, Croatia.

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Abstract

Posterior shoulder instability is a rare complication of posterior shoulder dislocation. Physical examination is usually insufficient in diagnosing it, so MR imaging, sometimes even MR arthrography, is required. There’s a wide range of injuries that can lead to posterior instability. In this article, we report posterior instability that occurred after a multiple dislocation. MR arthrography revealed complete rupture of the posterior inferior glenohumeral ligament and a humeral avulsion of the same ligament.

Keywords: Inferior Glenohumeral Ligament (IGHL); Glenohumeral Joint; PHAGL; Posterior Instability; MR Arthrography

Abbreviations

CT: Computed Tomography; GAGL: Glenoid Avulsion of the Glenohumeral Ligament; HAGL: Humeral Avulsion of the Anterior Inferior Glenohumeral Ligament; IGHL: Inferior Glenohumeral Ligament; MGHL: Middle Glenohumeral Ligament; MR: Magnetic Resonance; PHAGL: Humeral Avulsion of the Posterior Inferior Glenohumeral Ligament; SGHL: Superior Glenohumeral Ligament; SLAP: Superior Labral Anterior-Posterior Tear

Introduction

Glenohumeral ligaments are thickenings of the glenohumeral capsule, that act as passive stabilizers of the shoulder joint. Three of such ligaments were described; superior (SGHL), middle (MGHL) and inferior glenohumeral ligament (IGHL).

IGHL extends from inferior portion of the glenoid labrum to anatomic neck of the humerus. It’s composed of an anterior and a posterior band, alongside an axillary pouch positioned between them [1]. As an essential part of the capsule, IGHL acts as the main shoulder stabilizer. Anterior part is the leading stabilizer when the arm is abducted and in external rotation, when the arm is flexed and in internal rotation, the posterior band acts as the leading stabilizer [2].

Injuries of the IGHL are the most common capsular injuries. They mainly occur at the anterior portion of the ligament, following an anterior shoulder dislocation [3]. Injuries of the posterior portion band are much rarer. They are also mostly traumatic, occurring either after a posterior shoulder dislocation or as a result of repetitive microtrauma [4].

Due to complexity of the shoulder joint, standard MR imaging might not be sufficient. Thus, MR arthrography, with its superior visualization of joint structures, is considered a golden standard for such injuries [5].

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In this article, we describe a case of a posterior shoulder instability due to a complete posterior IGHL tear and a PHAGL lesion (humeral avulsion of the posterior IGHL).

Case Report

A 42-year-old patient presented with right shoulder joint instability after suffering two posterior shoulder dislocations that were not initially diagnosed. He also reported posterior shoulder pain, more prominent with backward shoulder movements.

On clinical examination, patients range of motion on the right side was decreased. Tests for diagnosing subacromial impingement syndrome were positive (Neer’s Sign and the Hawkins-Kennedy test). Speed test, used to test for superior labral tears, was also positive. Neurovascular examination showed no deficits.

Based on clinical presentation, subacromial impingement syndrome and SLAP lesion (superior labral anterior-to-posterior tear) were suspected.

Diagnostic procedure started with a standard X-ray that was used to exclude bone fracture and assess shoulder joint congruence (Figure 1).

![Figure 1: Standard radiogram of the right shoulder, AP projection: no visible bone fracture or joint dislocation.](image)

Afterwards, an MR arthrography was performed. It showed a complete, grade 3, tear of the posterior IGHL. Furthermore, a posterior humeral IGHL avulsion (PHAGL) was detected, alongside scar tissue in the axillary pouch (Figure 2).

Considering an MR arthrography was unable to exclude glenoid lesions, additional CT imaging was required. CT scans showed visible degenerative changes of the glenoid but excluded any traumatic bone lesions (Figure 3).
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**Figure 2a:** MR arthrography, T1 FS TSE, coronal plane: grade 3 tear of posterior IGHL.

**Figure 2b:** MR arthrography, T1 FS TSE, sagittal plane: grade 3 tear of the posterior IGHL and scar tissue in the axillary pouch.

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Figure 2c: MR arthrography, T1 FS TSE, transversal plane: posterior humeral IGHL avulsion (PHAGL).

Figure 3: CT, coronal plane: degenerative changes of the glenoid, no bone lesions.
Upon analyzing all the radiology findings, arthroscopic surgical reconstruction was decided as the best treatment option.

Discussion

This article presents a complex case of posterior shoulder instability due to a complete posterior IGHL tear and a PHAGL lesion.

Posterior instability, opposed to the anterior one, is quite uncommon, occurring in only 2 to 4% of shoulder instabilities [6]. Patients often present with confusing clinical symptoms, sometimes reporting only shoulder pain [3]. This clinical confusion was also present in our case, when even after a thorough clinical examination, GHL lesions were not primarily suspected. Castagna., et al. reported how physical examination of a PHAGL lesions (present in this case, as well) can be misleading and can’t be properly diagnosed without an MRI [7].

When analyzing the pathology of IGHL complex, it’s important to distinguish injuries of the ligament’s glenoidal and humeral insertion, from tears of the ligament itself (also known as midsubstance tears), keeping in mind that the mechanism of injury and the injuries itself are often overlapping [8]. Study done by Bigliani., et al. tested the tensile properties of the IGHL complex, reporting glenoid lesions with prevalence of 40%, midsubstance of 35% and humeral portion of 25% [9].

Midsubstance injuries usually occur following a traumatic shoulder dislocation and, as majority of the ligament injuries, can be categorized into three grades; where grade 1 represents a sprained ligament, grade 2 a partial tear and grade 3 a complete tear [8]. Grade 3 tears, presented in this article, are very rare and to the best of our knowledge, scarcely described in literature.

On the other hand, avulsion of glenohumeral ligaments from their humeral insertion is a frequent injury. Most common is the humeral avulsion of the anterior IGHL, known as HAGL. In the case presented here, posterior IGHL was the one separated from its humeral insertion, injury known as posterior HAGL or PHAGL. PHAGL is far less common than HAGL. It presents with shoulder pain or posterior instability and is often (in 67%) associated with other intra-articular shoulder pathology, proving that ours was a typical PHAGL injury [7].

Similar to beforementioned HAGL and PHAGL, GAGL or glenoid avulsion of the glenohumeral ligament is a shoulder injury that involves avulsion of the IGHL from the glenoid, alongside a separation from an intact labrum [10]. This injury was initially suspected, but additional CT imaging excluded a GAGL lesion in our patient [11].

Conclusion

In conclusion, case presented in this article is a combination of three relatively rare medical entities; posterior shoulder instability, PHAGL lesion and a complete, grade 3, IGHL tear, making this a uniquely complex shoulder injury worth reporting.

Conflict of Interest

The authors declared no conflict of interest.

Bibliography


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