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Case Report

Glenoid Fracture Plus Anterior Labral Periosteal Sleeve Avulsion (ALPSA) Lesion. The GALPSA Lesion

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Abstract

In this case report, we describe a bony glenoid fracture associated with an Anterior Labral Periosteal Sleeve Avulsion (ALPSA) lesion. To the best of our knowledge, ALPSA lesion plus glenoid fracture (GALPSA) has not been previously described. This diagnosis can be difficult and delayed.

Keywords: Shoulder arthroscopy, Glenoid fracture, Anterior Labral Periosteal Sleeve Avulsion

Introduction

Shoulder dislocations, most commonly anterior, represent 50% of all major joint dislocations. In these lesions, the pathological findings are usually fibrous or soft tissue (Bankart, SLAP, ALPSA, etc.) and bone lesions (Hill-Sachs, rim fracture, etc.) Fibrous Bankart lesion is an anterior and inferior labral detachment from the glenoid with an associated capsuloligamentous injury below the equator of the glenoid [1]. Bony Bankart is an anterior rim fracture with avulsion of the humeral labral complex [2]. Rim and glenoid fractures are different entities. Anterior Labral Periosteal Sleeve Avulsion (ALPSA) is an avulsion of the anterior labrum in which the periosteum remains intact, with subsequent healing of the labrum in a medialized position on the glenoid neck [3]. In this case report, we describe a bony glenoid fracture associated with an Alpsa lesion. To the best of our knowledge, ALPSA lesion plus glenoid fracture (GALPSA) has not been previously described. This diagnosis can be difficult and delayed.

Case Report

A 29-year-old male presented at the emergency department with right shoulder pain after a fall with direct trauma, and with the arm abducted and externally rotated. He had a limited range of motion, gross shoulder deformity and no associated neurovascular lesions. After plain radiographs were obtained, anterior shoulder dislocation was diagnosed, and the dislocation was easily reduced without general or local anesthesia. A 3D reconstructed CT image was obtained for a suspected glenoid fracture, confirming the diagnosis of a minimally displaced glenoid fracture (Figure 1), and conservative therapy was initiated according to our protocol involving immobilization in a sling for 4 weeks. A CT image was taken at 4 months and showed fracture consolidation (Figure 2). At the 6-month review, the patient maintained feelings of instability and shoulder pain and was unable to return to sports. During the physical exam, he had a load shift test grade I and a positive apprehension test. An MR arthrogram was obtained, and the patient exhibited an ALPSA lesion in the 2-6 o'clock position and a glenoid fracture consolidated in anatomic position with a minimal articular step (Figure 3). On the basis of these findings, arthroscopy was performed in the lateral decubitus position under general anesthesia, and arthroscopic technique consisted in converting the ALPSA lesion into a Bankart lesion and thereafter fixing the labrum with 4 all suture anchors (Jugger-Knot Zimmer Biomet®) according to the protocol described by Neviaser [4]. (Figure 4,5). The patient followed a 4 weeks of inmobilitation with a sling, after which physical therapy was initiated. At the 6-month follow-up after the surgery, the patient reported no pain and no sensation of instability and returned gradually to sports.

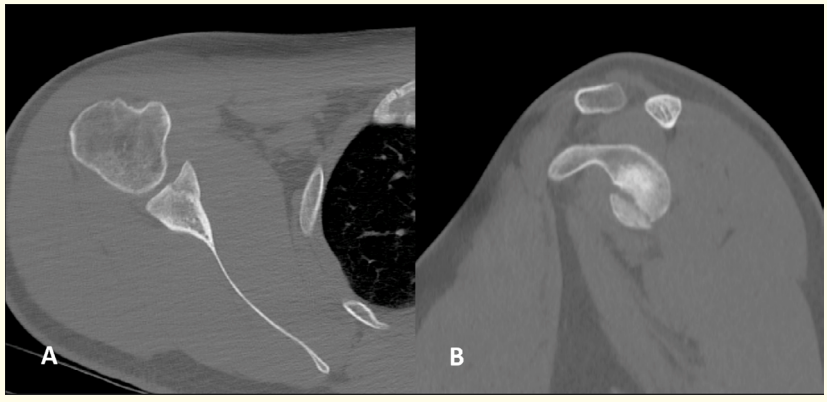

Figure 1: Right shoulder: (A)Saggital and (B)coronal CT image showing minimally displaced glenoid fracture.

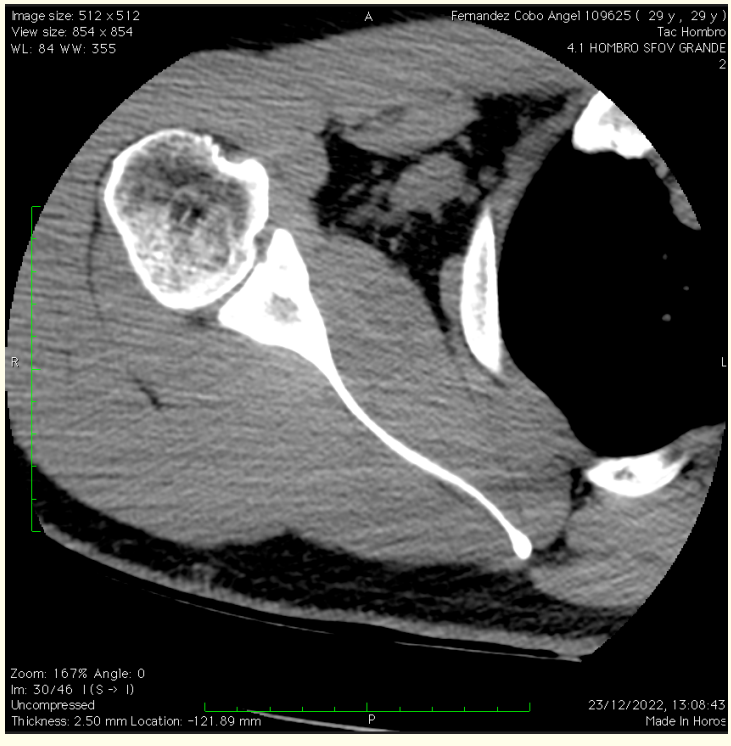

Figure 2: Right shoulder. Axial CT image showing consolidated fracture and congruent glenoid cavity.

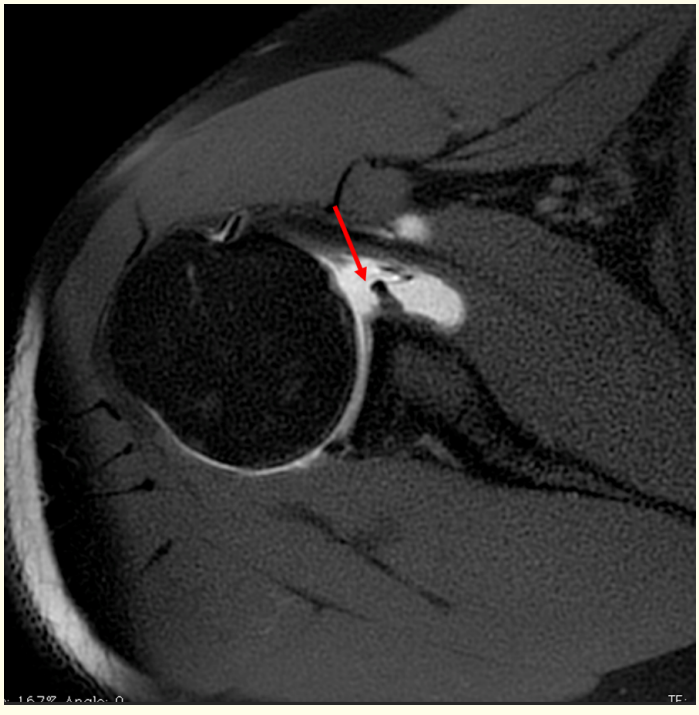

Figure 3: MR Arthrogram. Axial T1 fat-saturated arthrographic image showing an ALPSA lesion (Red arrow).

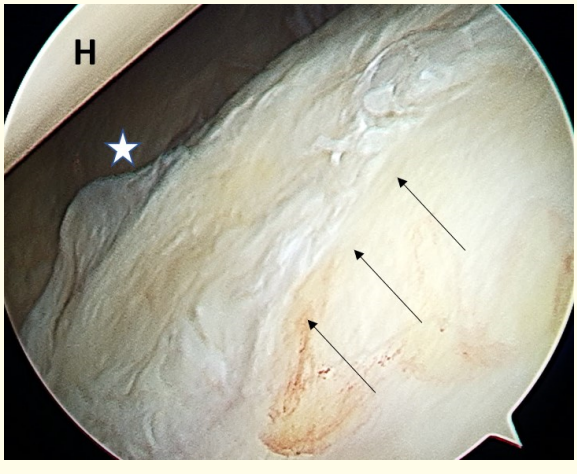

Figure 4: Right shoulder. Arthroscopic view of the consolidated glenoid fracture (arrows) and ALPSA lesion (star) H (Humerus).

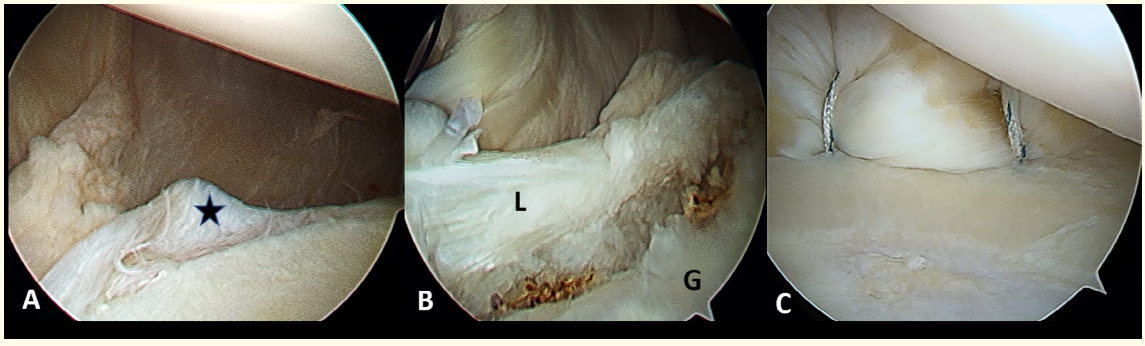

Figure 5: Right shoulder. (A)ALPSA lesion (Black star) (B) Conversion of the ALPSA lesion into a Bankart lesion (C) Final result after fixation with all suture anchors. L (Labrum) G (Glenoid).

Discussion

Although glenoid bone loss is a well-recognized complication of anterior shoulder instability [5], to our knowledge, the association of an undisplaced glenoid fracture with anterior labroligamentous periosteal sleeve avulsion (ALPSA) has not been described before (GALPSA lesion). Glenoid fractures and rim lesions are different entities. Bigliani., *et al*. [6] divided rim lesions into 3 variants: Type I represents an avulsion fracture with intact soft tissue attached, type II includes a medially displaced fragment, and type III represents chronic erosion of the rim. The most commonly used classification for glenoid fractures is the Ideberg´s classification[7] and this particular classification does not offer any useful information on the condition of surrounding soft tissues. Our patient had a minimally displaced glenoid fossa fracture type 1B according to Ideberg´s classification but also had a medially dislocated capsuloligamentous complex, which cannot be framed in any of the 3 Bigliani variants. Previous studies have regarded ALPSA lesions as chronic rather than acute [8]. Habermeyer., *et al*. [9] described the development of periosteal sleeve detachment as a progressive process from reiterated instability insults and defined it as a "triple lesion" to underlie its evolutive nature. Interestingly, our case challenges this piece of common knowledge. Our patient, in fact, did not sustain any further dislocation episodes outside the first injury. Rather, he complained of persistent pain and an overall sense of instability from the very beginning, potentially suggesting that a major compromise of soft tissues happened in the acute setting. To explain the process of injury, we propose a "two-hit hypothesis" mechanism. We believe that first, direct impaction injury occurred between the humeral head and the glenoid fossa, resulting in the large glenoid fracture observed here. Then, the continuous vector of force applied on an abducted and externally rotated arm induced anterior translation of the humeral head with subsequent peel-off of the capsuloligamentous complex, thereby resulting in an ALPSA lesion. Therapy for a large glenoid fracture in patients with anterior glenohumeral instability remains controversial. Sugaya., *et al*. [10] divided glenoid rim fractures into small, medium and large fractures according to the percentage of glenoid articular surface involved. He advocated for open or arthroscopic repair in the first two categories and bone block procedures for larger defects. The belief of a need for intervention was generated by the work of Itoi., *et al*. [11], who showed how a bone defect encompassing 25% or more of the glenoid fossa might predispose patients to further instability in the future. However, a recently published study [12] challenged this concept, underlining how acute defects substantially differ from the bone erosion observed in chronic instability, often due to repetitive episodes of instability. The first report on conservative treatment for large glenoid fractures was performed by Ernstbrunner [13], who reported good to excellent results when the humeral head remained centered in the glenoid fossa after reduction.

Conclusion

The presented case highlights the importance of understanding the role of soft tissues in glenoid fractures. We believe that orthopedic surgeons should consider this possibility when patients complain of a feeling of instability after conservative treatment of large, undisplaced glenoid fractures. A careful history should inquire how the trauma occurred and, in the presence of a fall with the upper limb in abduction and external rotation, evaluate the need for an MRA instead of a classical MRI to avoid missing important soft tissue lesions with severe consequences on patients' joint function.

Patient Consent Disclosure Statement

The author(s) attests that consent has been obtained from any patient(s) appearing in this publication.

Conflict of Interest Statement

None declared.

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