

An exceptional case of posterior shoulder fracture dislocation in patient with recurrent anterior dislocation forming “Mirror Hill-Sachs lesion”

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Abstract

A posterior dislocation should be always kept in mind in a painful shoulder especially after trauma or seizure. Even in the presence of recurrent dislocation, the direction may be different from one episode to another.

KEYWORDS

bidirectional shoulder dislocation, Hill-Sachs lesion, posterior fracture dislocation, recurrent anterior dislocation, Reverse Hill-Sachs lesion

1 | INTRODUCTION

A 27-year-old male with history of recurrent anterior shoulder dislocations (ASD) presented with undiagnosed posterior fracture dislodgement, following an episode of seizure. Posterior dislocation is even more likely to be missed in the presence of recurrent anterior dislocation.

Shoulder joint is often referred as “golf ball on tee,” this distinct architecture allows wide arc of motion but at the expense of integral instability that may result in dislocation.¹ Forward directed displacement of the humeral head out of the socket results in anterior glenohumeral dislocation and contrasting mechanism of trauma can cause posterior shoulder dislocation (PSD).² Recurring trauma can cause unidirectional glenohumeral instability leading to recurrent anterior shoulder dislocation (ASD).³ To the best of our knowledge, there is no report of recurrent ASD presenting with posterior dislocation or vice versa.

Glenohumeral instability could be traumatic unidirectional or atraumatic multidirectional.⁴ Patients with multidirectional instability (MDI) express hyper-laxity of glenohumeral capsule and an instable shoulder in more than one direction.⁵ Patients with recurrent traumatic dislocations have primary

direction of instability, and it is rare that anterior and posterior dislocations occur in the same patient. However, in our patient there was no MDI at play rather a recurrent traumatic unidirectional anterior dislocation and presented with first ever PSD. This is unusual, as he had no previous history of seizure disorder or evidence of capsular laxity.

Majority of shoulder dislocations are anterior displacements with postero-lateral humeral defect known as “Hill-Sachs lesion.”^{2,6} In contrast, PSD are relatively rare and occasionally present with antero-medial defect of humeral head “Reverse Hill-Sachs.”^{7,8} An unusual presentation in this patient was a double lesion. We termed it “Mirror Hill-Sachs” and discussed it further. Given the infrequency, PSD are known to be easily missed.⁸ In patients with recurrent ASD chances of missing, a PSD could be remarkably high.

Here we present a case of recurrent ASD with an acute episode PSD. Purpose of this report was threefold. First, inform orthopedic community that even a patient with known unidirectional dislocation can present with other forms displacement. Second, highlight the complexity of diagnosis and management of such presentation. Third, highlight the ongoing problem of missed posterior fracture dislocations.

2 | CASE HISTORY/ EXAMINATION

Twenty-seven-year-old male presented to shoulder clinic with 10-day history of diffuse pain in right shoulder, restricted range of motion, and arm held in internal rotation. Patient had history of traumatic anterior shoulder dislocation (ASD) 5 years ago and has been recurrent since then. He had no history of multidirectional instability (MDI) or convulsion disorder except this one event of seizure triggered by Tramadol, following which his shoulder symptoms began. Patient immediately visited emergency department where he was diagnosed with spontaneously reduced ASD and discharged after antero-posterior (AP) shoulder X-ray was read normal (Figure 1).

Patient visited us with a flexed, adducted, and internally rotated shoulder. We obtained orthogonal views (Figure 2) and discovered posterior fracture dislocation of right shoulder. Further evaluation was done with magnetic resonance imaging (MRI) (Figure 3) and computed tomography (CT) scan (after surgery) (Figure 4). We noted Hill-Sachs lesion on posterior-lateral surface of humeral head, reverse Hill-Sachs lesion on antero-medial surface, and a fracture line connecting these lesions (Figure 4). This coexistence of two Hill-Sachs lesions simultaneously is unique, in fact never observed before. “A Mirror Hill-Sachs lesion.”



FIGURE 1 X-ray AP view postseizure taken at the emergency department

3 | TREATMENT

Considering the time elapsed after dislocation and accompanying fracture, closed reduction was not attempted and patient was prepared for open reduction. Deltopectoral approach was used, and joint space was accessed through rotator interval. Posteriorly dislocated humerus was reduced under direct vision then we noticed complete detachment of anterior labrum from glenoid rim; however, there was no glenoid bone defect. Subscapularis peeling was done from lesser tuberosity, and anterior labrum was repaired to glenoid using two 2.8 anchor sutures. Reverse Hill-Sachs lesion was remplissaged by previously peeled off subscapularis tendon (Figure 5). Proximal humerus anatomic locking plate was used for fracture fixation and as fracture was undisplaced did not require reduction.

Postoperative X-ray showed reduced glenohumeral joint (Figure 6), subsequent examinations prior to discharge showed stable fixation and no joint dislocation.

Outcome and follow-up.

Follow-up at 1, 4, 8, and 12 weeks after the surgery showed good recovery and surgical outcome. As shown in Figure 7, acceptable range of motion was regained; flexion: 140°, abduction: 100°, internal rotation: L2, external rotation: 60°. Patient follow-up continued for 2 years, and so far, no dislocation was reported; neither anterior nor posterior. Informed consent was obtained for publication of this report.

4 | DISCUSSION

This case emphasizes that patients with recurrent unidirectional glenohumeral dislocations can present with a shoulder dislocation in opposite direction. However rarely this event may occur, it may occur. Such an injury presents with both diagnostic and treatment challenges. We like to highlight on how often a posterior shoulder dislocation is missed and factors that play a role in this neglect.

Primary traumatic glenohumeral dislocation in young patients has reoccurrence rate of 55%-66%.³ Recurrent dislocations cause impairment in shoulder function and hinder daily living activities.³ Over 90% of shoulder dislocations are anterior, occurring mostly in young men with high-energy trauma.⁹ PSD are rare, easily missed or delayed diagnosed in 50%-70% of cases.¹⁰ Missed PSD can be attributable to (a) infrequency, (b) subtle clinical examination findings, (c) clinician underestimating the importance of patient presentation, (d) inadequate initial imaging.^{8,10,11}

Few signs to look for PSD in AP view include a bulb sign owing to internally rotated humerus and no overlap of humeral head over glenoid.⁸ However, in patients with humeral engagement, glenohumeral overlap can be found as in our patient and it increases the chances of dislocation being overlooked

FIGURE 2 A, AP view of right shoulder demonstrating internal rotation of humerus. Arrow: Fractured fragment. B, Lateral view of right shoulder indicating posterior dislocation. Locked engaging posterior dislocation makes diagnosis difficult. Extreme internally rotated proximal humerus in AP view (A) and placing humeral head out of center of Y and under Acromion process in Y-view (B) are signs of posterior dislocation

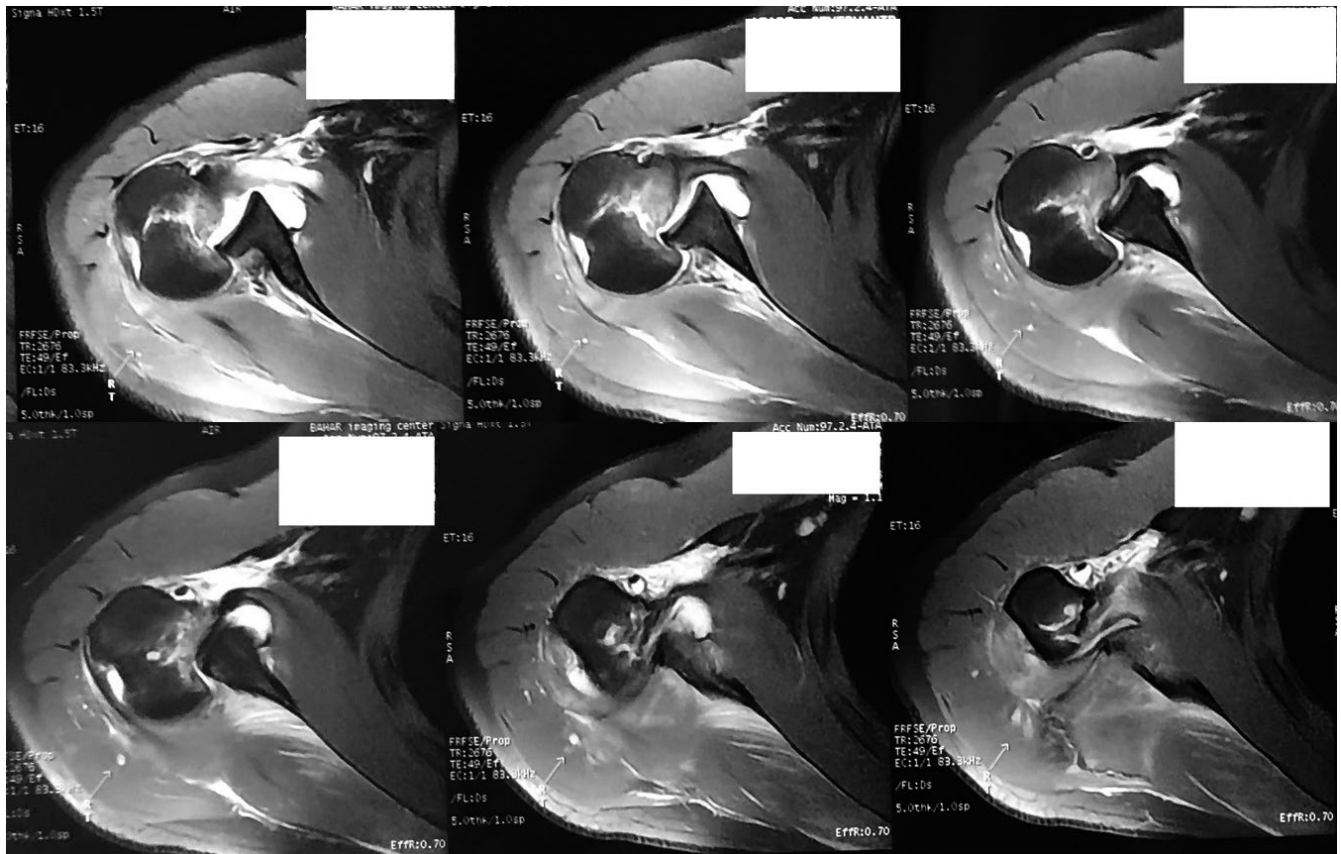
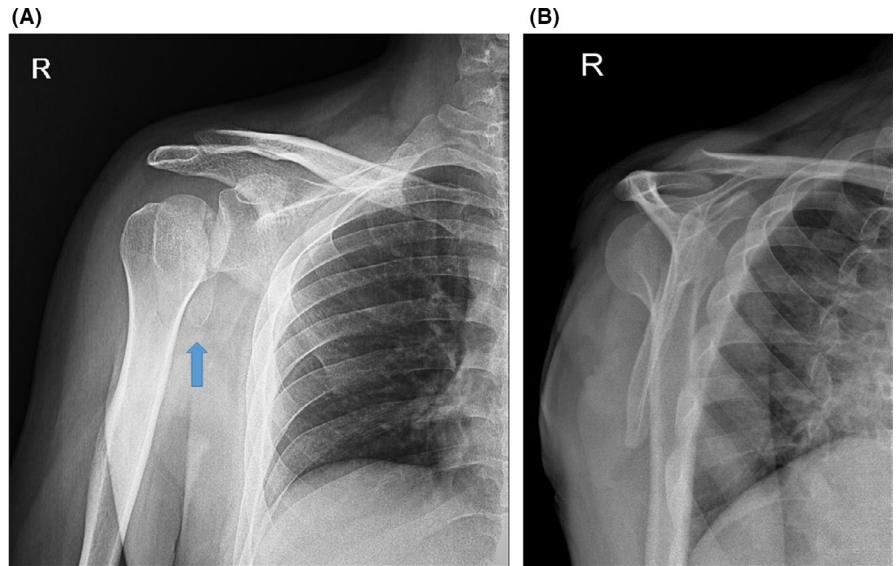


FIGURE 3 Magnetic resonance imaging of shoulder axial view (fat-saturated T2-weighted-STIR) demonstrating posteriorly locked humeral head with glenoid. Presence of Hill-Sachs and reverse Hill-Sachs lesion, fracture line, joint hematoma, and complete detachment of anterior labrum are other findings in this image

(Figure 1). Therefore, shoulder evaluation should as well include an orthogonal (Y) view, which significantly reduces the rate of missed diagnosis (Figure 2).¹² In such cases having computed tomography (CT) scan of shoulder would not only help in diagnosis but aid in guiding appropriate surgical plan.

The glenohumeral joint is enforced and stabilized by ligamentous structures. Any compromise in glenohumeral stabilizers leads to subluxation, eventually creating instability.¹³ Recurrent episodes of unidirectional dislocations result in ligamentous laxity thereby permitting more easy displacement



FIGURE 4 Computed tomography scan axial view; A, blue arrow-bicipital groove, green arrow-fracture line. B, marked outline showing Mirror Hill-Sachs lesion

in same direction.¹⁴ Therefore, any patient sustaining shoulder-displacing forces; the joint effortlessly dislocates in the direction of ligamentous instability. Although our patient was suffering from traumatic recurrent anterior shoulder dislocation (unidirectional instability), this one episode of seizure caused glenohumeral joint to dislocate posteriorly rather than just displacing in the direction of instability.

Patients with MDI report of subluxations in more than one direction more commonly antero-inferior or posterior-inferior. These displacements in MDI are the result of generalized ligamentous capsular laxity and are different from true traumatic dislocations.¹⁵ Patients with convulsion disorder are reported to have MDI and seldom may present with different forms dislocation.¹⁶ However, our patient was neither

involved in seizure disorder (except this one episode) nor did he had signs and symptoms of MDI prior to this posterior dislocation.

Recurrent ASD creates an osseous defect on posterior-superiolateral surface of humeral head. Coined as “Hill-Sachs lesion” after *H A Hill* and *M D Sachs* described it in their paper “The grooved defect of the humeral head” in 1940.¹⁷ Later, *C S Neer* detailed several other fractures of humeral head associated with dislocations including “Reverse Hill-Sachs Lesion” of posterior dislocation.¹⁸ It is also known as *McLaughlin's* lesion, who did an extensive study on posterior dislocations and developed a celebrated technique for repair of this antero-medial lesion.¹⁹ Remarkably, we noticed something unusual in this case, a double Hill-Sachs lesion.

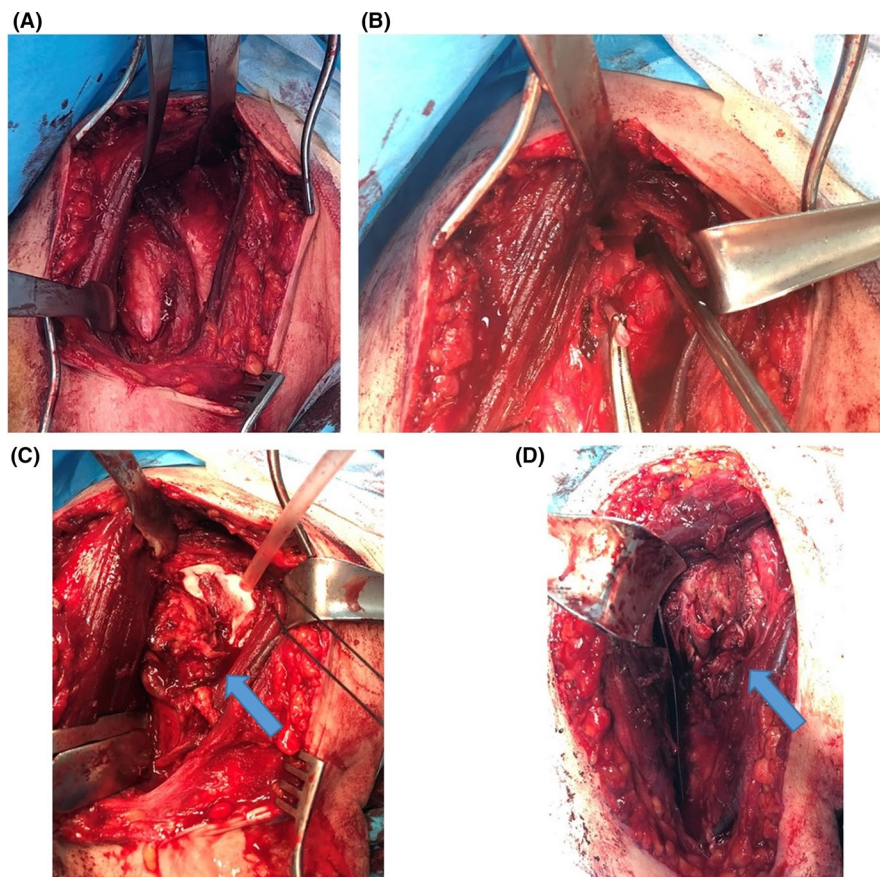


FIGURE 5 Intraoperative images; A, Deltopectoral interval & absence of humeral head curvature indicating posterior dislocation. B, Opening of rotator interval & biceps tenotomy for open reduction. C, Reverse Hill-Sachs lesion. D, Reverse Hill-Sachs defect repaired with subscapularis

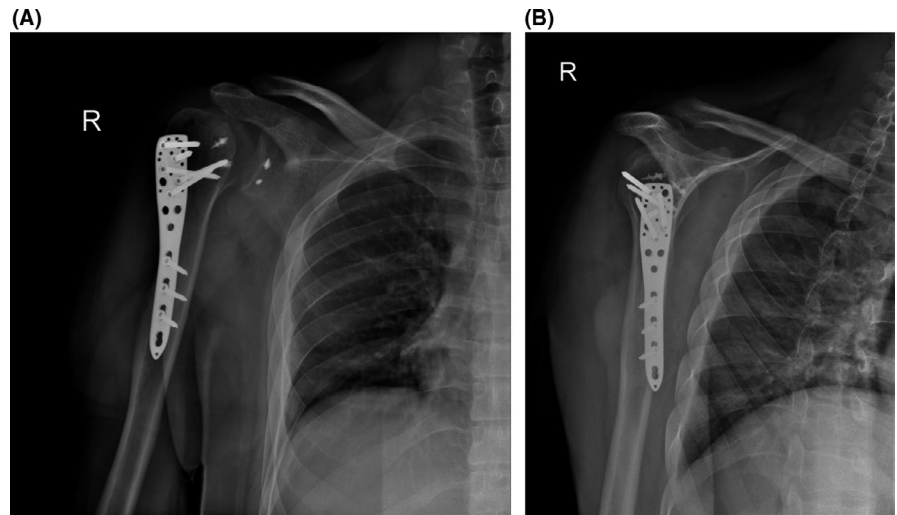


FIGURE 6 Postoperative X-rays A, AP, B, Lateral view

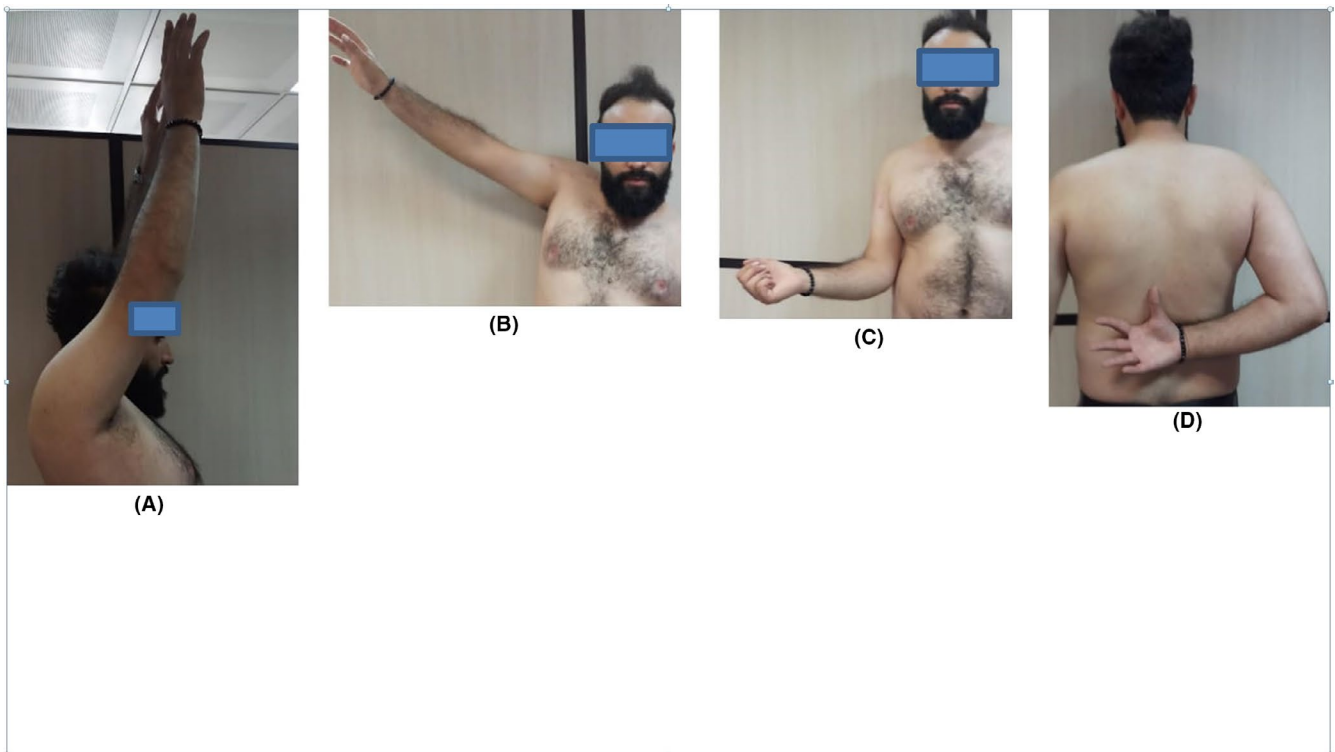


FIGURE 7 Follow-up after 12 mo showed A, 140° elevation B, 90° abduction C, Internal rotation up to T12 D, 50° external rotation

A postero-lateral humeral defect as result of recurrent ASD and this event of PSD caused an antero-medial lesion. A sign never noticed before. We termed it “Mirror Hill-Sachs lesion” as both lesions appear to be mirror images of each other through their respective opposite surfaces of humerus.

As our patient, a case of recurrent anterior dislocation presented with posterior fracture dislocation. We proclaim that any patient with recurrent unidirectional glenohumeral dislocation can present with other forms of shoulder displacement. The case could alarm all of us that every dislocation episode

may be in any direction regardless of previous history. This report as well emphasize that posterior shoulder dislocations are easily missed at initial presentation; high suspicion and comprehensive examination including orthogonal shoulder view is prerequisite in detecting such injuries. Therefore, not only X-rays but also patient presentation is worth our attention.

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CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTIONS

MRG: Participating in patient's surgery, Editing the manuscript and final approve of the article. FMYK: Participating in writing the manuscript, patient's follow-up and preparing photographs. NB: Patient's main surgeon, participating in writing and editing the manuscript, patient's follow-up and preparing the patient's data.

ETHICAL APPROVAL

Informed consent was obtained from the patient for this report.

DATA AVAILABILITY STATEMENT

All the data consisting X-rays, Full CT scan, and MRI images are available on demand.

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REFERENCES

- Dumont GD, Russell RD, Robertson WJ. Anterior shoulder instability: a review of pathoanatomy, diagnosis and treatment. *Curr Rev Musculoskelet Med*. 2011;4(4):200-207.
- Theivendran K, Thakrar RR, Deshmukh SC, Dwan K. Closed reduction methods for acute anterior shoulder dislocation. *Cochrane Database Syst Rev*. 2019;2019(1):CD011051.
- Robinson CM, Howes J, Murdoch H, Will E, Graham C. Functional outcome and risk of recurrent instability after primary traumatic anterior shoulder dislocation in young patients. *JBJS*. 2006;88(11):2326-2336.
- Warby SA, Watson L, Ford JJ, Hahne AJ, Pizzari T. Multidirectional instability of the glenohumeral joint: etiology, classification, assessment, and management. *J Hand Ther*. 2017;30(2):175-181.
- Hirakawa M. Pathophysiology of the loose shoulder presenting a high degree of loosening. *Jpn J Rheum Joint Surg*. 1991;10(3):369-374.
- Provencher MT, Frank RM, LeClere LE, et al. The Hill-Sachs lesion: diagnosis, classification, and management. *J Am Acad Orthop Surg*. 2012;20(4):242-252.
- Guehring M, Lambert S, Stoeckle U, Ziegler P. Posterior shoulder dislocation with associated reverse Hill-Sachs lesion: treatment options and functional outcome after a 5-year follow up. *BMC Musculoskelet Disord*. 2017;18(1):442.
- Perron AD, Jones RL. Posterior shoulder dislocation: avoiding a missed diagnosis. *Am J Emerg Med*. 2000;18(2):189-191.
- Cutts S, Prempeh M, Drew S. Anterior shoulder dislocation. *Ann R Coll Surg Engl*. 2009;91(1):2-7.
- Jacobs RC, Meredyth NA, Michelson JD. Posterior shoulder dislocations. *BMJ*. 2015;350:h75.
- Espag M, Back D, Baroni M, Bennett A, Peckham T. Diagnosing shoulder dislocations: time for a change of view. *Ann R Coll Surg Engl*. 2002;84(5):334.
- Robinson CM, Seah M, Akhtar MA. The epidemiology, risk of recurrence, and functional outcome after an acute traumatic posterior dislocation of the shoulder. *JBJS*. 2011;93(17):1605-1613.
- Hess S. Functional stability of the glenohumeral joint. *Man Ther*. 2000;5(2):63-71.
- Burkart AC, Debski RE. Anatomy and function of the glenohumeral ligaments in anterior shoulder instability. *Clin Orthop Relat Res*. 2002;400:32-39.
- Castagna A, Grasso A, Vinanti G. Minor shoulder instabilities. In: Lajtai G, Snyder SJ, Applegate GR, Aitzetmüller G, Gerber C, eds. *Shoulder arthroscopy and MRI techniques*. Berlin, Heidelberg: Springer; 2003:193-212.
- Thangarajah T, Lambert S. The management of recurrent shoulder instability in patients with epilepsy: a 15-year experience. *J Shoulder Elbow Surg*. 2015;24(11):1723-1727.
- Hill HA, Sachs MD. The grooved defect of the humeral head: a frequently unrecognized complication of dislocations of the shoulder joint. *Radiology*. 1940;35(6):690-700.
- Neer CS. Displaced proximal humeral fractures: part II. Treatment of three-part and four-part displacement. *JBJS*. 1970;52(6):1090-1103.
- McLaughlin HL. Posterior dislocation of the shoulder. *JBJS*. 1952;34(3):584-590.

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