



Review article

A treatment algorithm for locked posterior dislocation of shoulder

Ashish Babhulkar*, Vishnu Unnithan, Prateek Patil

Dept of Shoulder & Sports medicine, Deenanath Mangeshkar Hospital, Pune, 411004, India



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ABSTRACT

Aim: The purpose of the study was to analyse features of locked posterior shoulder dislocation and provide a surgical algorithm to facilitate optimal results in this complex condition and present the results in 31 consecutive cases in 30 patients.

Materials and methods: We present a retrospective series of 39 patients with locked posterior shoulder dislocation. 31 locked posterior dislocations (one bilateral posterior locked dislocation) in 30 consecutive patients of the 39 are included. Patients were classified according to the measured reverse Hill Sachs defect and critical fragment. UCLA scores were measured at a minimum of six months post-operative follow up and radiographs were taken at yearly follow up.

Results: The average UCLA score was 28.61 (minimum 15 and maximum of 35). 17 cases had a good to excellent result with 11 of these 17 achieving a score of 35. There were 9 fair and 5 poor results amongst the 31 cases.

Conclusion: Early diagnosis is desirable to avoid invasive non-anatomical procedures. Assessment of critical fragment and reverse Hill Sachs will achieve a more accurate osteotomy. A native cartilage transfer is much better than iliac crest grafting. The derotation osteotomy is reserved for malunited fracture dislocation patients presenting late and less than optimal results are likely. All the patients presenting late beyond a year inevitably required a hemiarthroplasty.

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* Corresponding author.

E-mail address: docshoulder@gmail.com (A. Babhulkar).

1. Introduction

Even in this modern age, posterior dislocation of the shoulder joint is commonly missed at the first instance, leading to a complex condition of persistent dislocation, chronicity, pain and dysfunction. Although the incidence of posterior dislocations amongst shoulder injuries is less than 2%,¹ worldwide reported rates for missed posterior dislocation vary from 50% to 79%.^{2–6} All aspects of locked posterior dislocation are convoluted as compared to anterior shoulder dislocation that is more common, overt and obvious. The rarity of this condition along with its typical manifestations often eludes a prompt diagnosis, further complicating its treatment. The condition is variably named as locked, chronic, missed, persistent or even locked posterior dislocation. The patient not only presents with limited range of movement but pain in the initial stages. While the incidence of nerve injury in locked posterior dislocation of shoulder has not been highlighted in the literature, it is possible that the incidence of nerve injury is more common. In addition to the physical dysfunction, patients of locked posterior dislocation suffer emotionally as their diagnosis was missed and the delay compromises recovery and causes at least temporary disability. Recurrence after surgery is also not unknown and addressing a failed surgery for the same can be an intricate issue. Since there are several variables influencing the outcome of surgery in locked posterior dislocation of the shoulder it has been difficult to give a treatment algorithm for locked Posterior dislocation of shoulder. Due to the paucity of reports and rarity of the condition, it is often difficult to advocate a standard regimen. Age of the patient, duration of the dislocation, extent of the reverse Hill Sach's defect, status of the cartilage, size of the critical fragment (CF) (ref 1.4.a section), neurological status are important factors that need to be considered in decision making. With the wide number of surgical options available, it is the aim of this study to provide a guideline for the treatment of locked dislocation of the shoulder. In addition, after analysis of the factors studied, we have devised a classification system that would make surgical decision making simpler. There is sparse literature on the subject and even fewer papers that provide an algorithm for treatment except for Cicak¹ and Jochen et al.⁷

2. Clinical features

The mechanism of injury is adduction, internal rotation and flexion. Bulky posterior shoulder musculature and the natural lie of the shoulder in internal rotation further mask the deformity. Even then simple understanding of the pathology and awareness of the condition can prevent a misdiagnosis. This is probably the only condition where the affected arm is steeply fixed in internal rotation. In the initial few weeks, pain is disproportionately severe to the apparent lack of deformity. The patient is unable to externally rotate even a few degrees but seldom may reach just short of neutral. If the arm can rotate beyond neutral position it is highly unlikely to be a posterior dislocation of shoulder. The axial movements of forward flexion and abduction are deceptively impressive, though not full. With such robust clinical findings, there is no true differential for this condition. Few conditions mimic a locked posterior dislocation of shoulder closely and an experienced surgeon should easily discern between the two. Rowe & Zarins test⁸ demonstrates the inability to fully supinate the affected side forearm, in the presence of a locked posterior dislocation. Although forearm supination is unrelated to shoulder dislocation biomechanically, it is the steeply internally rotated shoulder that causes the lack of supination. (Fig. 1)

A severe frozen shoulder with loss of rotation can imitate a locked posterior dislocation of shoulder. However, in frozen shoulder, both internal and external rotations are affected unlike



Fig. 1. Rowe Zarins test.

a locked posterior dislocation of shoulder where external rotation is predominantly affected. A malunited proximal humerus with restricted rotations comes a close second but again there is usually a global loss in the range of movement, including the axial movements. Apart from these two conditions a locked posterior dislocation of shoulder is unlike any other disorder but is still a dilemma for the surgeon who has never seen one.

In late presentations and lean patients, the humeral head may be felt posteriorly along with some amount of wasting of the posterior muscles. Unlike a chronic anterior dislocation, however, the round contour of the shoulder is retained. To the attentive eye, the coracoid process may be prominent on the affected side.

Seldom locked posterior dislocation of shoulder is associated with neuropathy, usually of the Suprascapular and Axillary nerves. Locked posterior dislocation with an associated neuropathy would complicate an already difficult problem.

AP Radiographs add to the predicament, as they appear spuriously normal. On the AP radiograph the head of humerus appears to be in steep internal rotation; an **inverted light bulb appearance** (Figs. 2 and 3). On a closer look, the glenoid also appears empty; a **vacant glenoid sign**. Like a standard anterior instability, there is a humerus defect, albeit positioned anterior-medially; a reverse hill Sachs defect. This can also appear as a **double trough sign** on an AP radiograph. A lateral radiograph is crucial to the diagnosis and if the surgeon were to take a lateral radiograph, it would be diagnostic. The lateral radiograph provides important information about the humeral head position and the size of the reverse Hill Sachs defect.⁹ The humeral head can be seen clearly posterior to glenoid and would also reveal the reverse Hill Sachs, which is typically medial to the long head of biceps groove, in the antero-medial sector of the humeral head. Unfortunately, often, an axial radiograph is not done - partly as it is difficult and also because a primary clinical diagnosis was never made. Whenever the surgeon is perplexed at the presence of disproportionate symptoms compared to the clinical appearance, he should not hesitate to seek a CT Scan that would clinch the diagnosis. A CT scan is recommended even if a correct diagnosis has been made on radiographs. The CT will allow classification of the dislocation and

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