

# Irreducible Posterior Fracture Dislocation of the Shoulder: A Case Report

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## Abstract

Posterior shoulder fracture-dislocation is a rare traumatic entity. Early diagnosis results in the adequate treatment of these lesions and prevents serious complications, such as avascular necrosis.

Several therapeutic options have been proposed depending on the size of the humeral defect, duration of the dislocation, age of the patient, associated comorbidities, and functional requirements. For this kind of injury, early open anatomical reduction and stable internal fixation remain the optimum treatment option. Arthroplasty is often the last resort for active young patients, particularly in cases of avascular necrosis, humeral head complex fracture, or undiagnosed posterior shoulder dislocation.

Here, we report a case of a complex posterior shoulder fracture-dislocation in a young man, which was treated surgically with open reduction and locked plate osteosynthesis using a deltopectoral approach.

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**Categories:** Trauma

**Keywords:** surgical treatment, rare, complex, shoulder, posterior fracture-dislocation

## Introduction

Posterior shoulder dislocation represents fewer than 5% of all shoulder dislocations. According to Neer and Foster, when associated with a fracture, it is much more uncommon [1,2]. PDS can be complicated by a fracture of the anatomical neck, known as a complex posterior shoulder fracture-dislocation. It is most commonly observed in highly kinetic trauma [3] and seizures and electrocution, in which the mechanism is a forced flexion associated with adduction and internal rotation of the shoulder [4]. Early diagnosis results in the adequate treatment of these lesions and prevents serious complications, such as avascular necrosis [5].

Several therapeutic options have been suggested for these lesions, ranging from non-surgical methods to surgical repair or prosthetic replacement; however, optimal treatment management remains a subject of controversy [6-8].

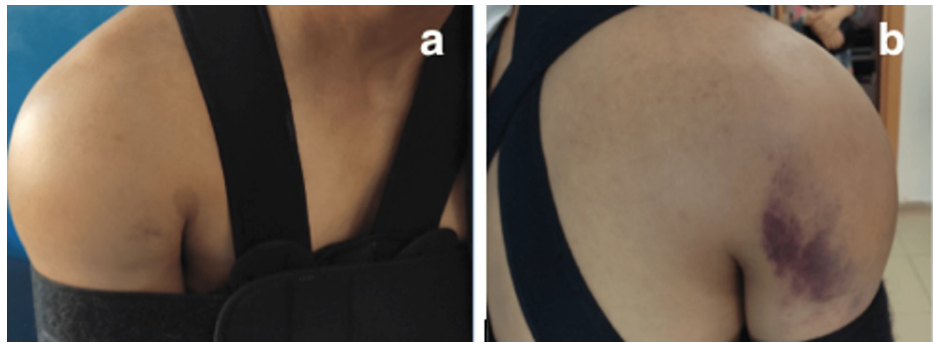
Here, we report a case of a complex posterior shoulder fracture-dislocation in a young man, which was treated surgically with open reduction and locked plate osteosynthesis using a deltopectoral approach.

## Case Presentation

A 34-year-old man with no history of pathology fell from a scaffold (estimated at 6 m high). The clinical examination revealed a painful, edematous right shoulder with ecchymosis on the posterior surface. The vascular-nervous examination was normal (Figure 1).

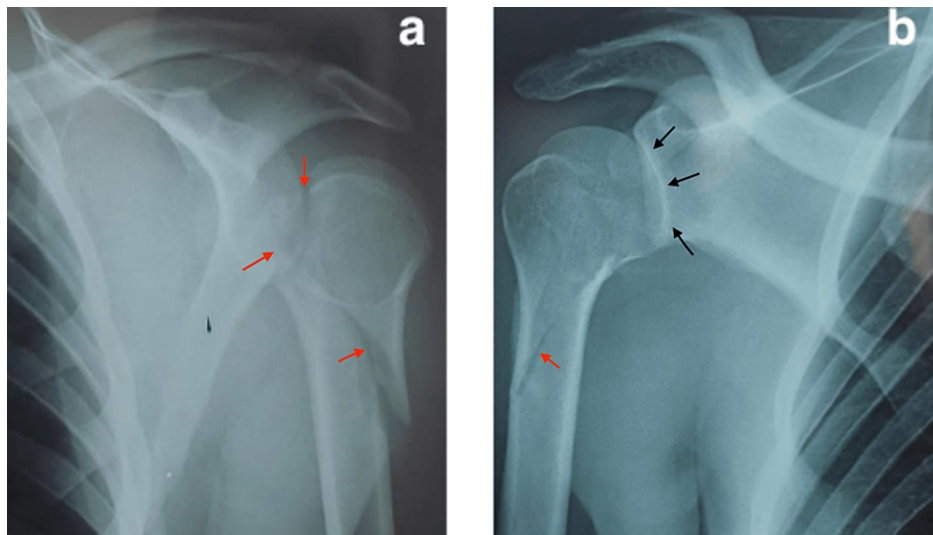
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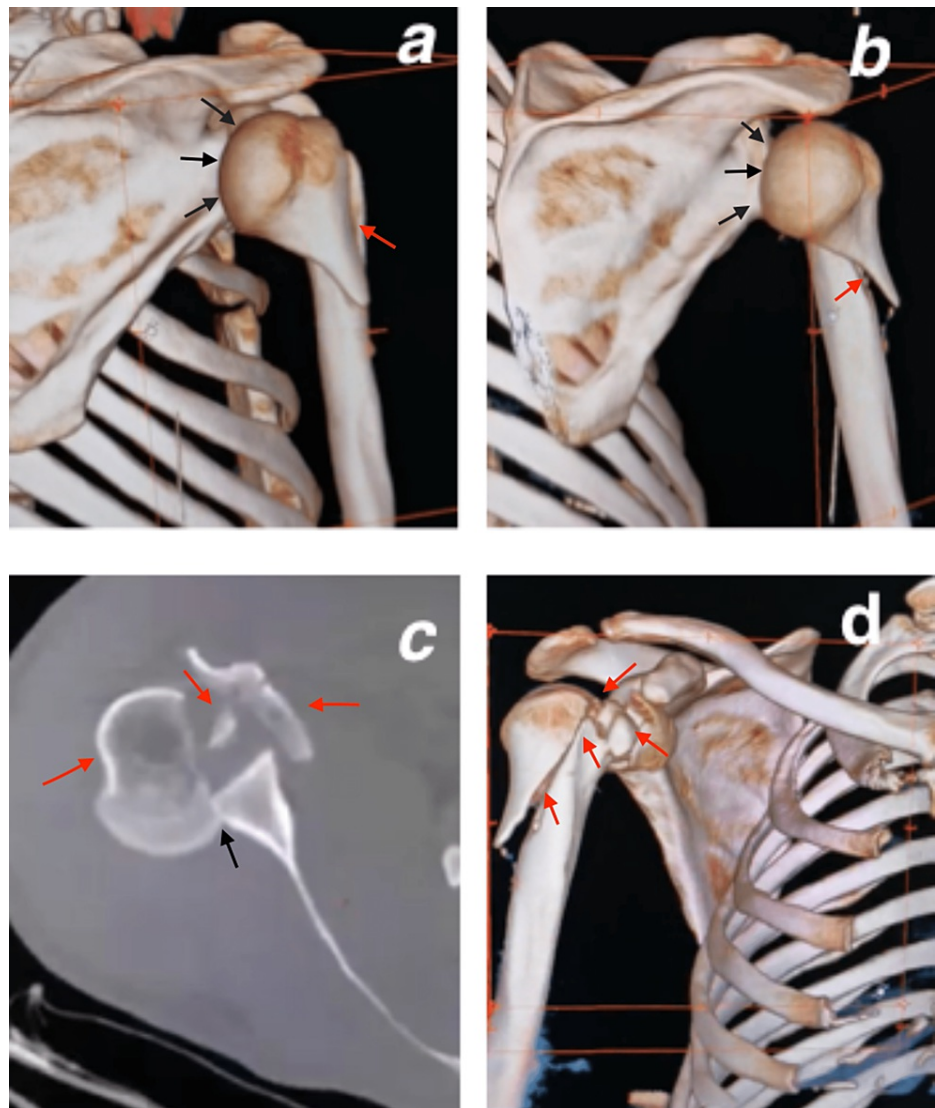


**FIGURE 1: Clinical aspect of the patient's right shoulder after the trauma showing edema and ecchymosis posteriorly.**

The radiological assessment using standard radiographs (Figure 2) and CT scan (Figure 3) of the right shoulder showed a posterior shoulder dislocation with a complex three-part fracture of the humerus proximal extremity, as classified by Neer and Foster [2], with failure of the closed reduction, which was performed under sedation.

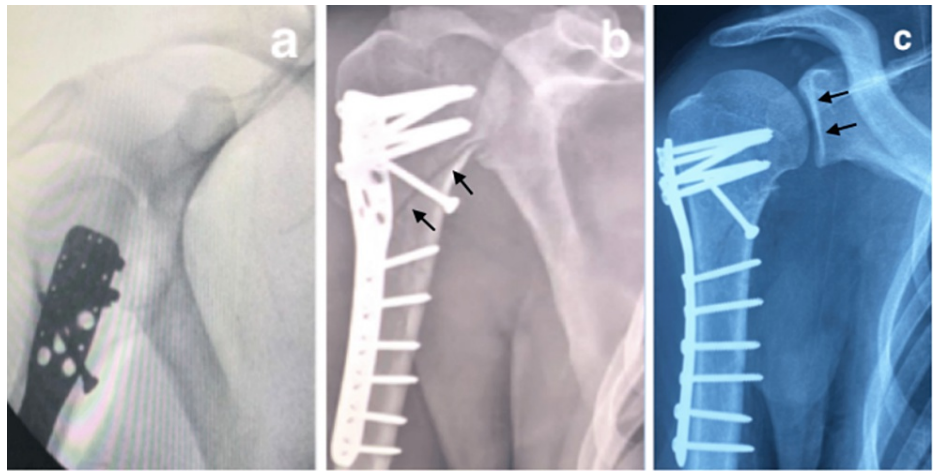


**FIGURE 2: X-rays of the right shoulder after the trauma showing a fracture (red arrow) of the right proximal humerus, with a posterior dislocation (black arrow) of the humeral head.**



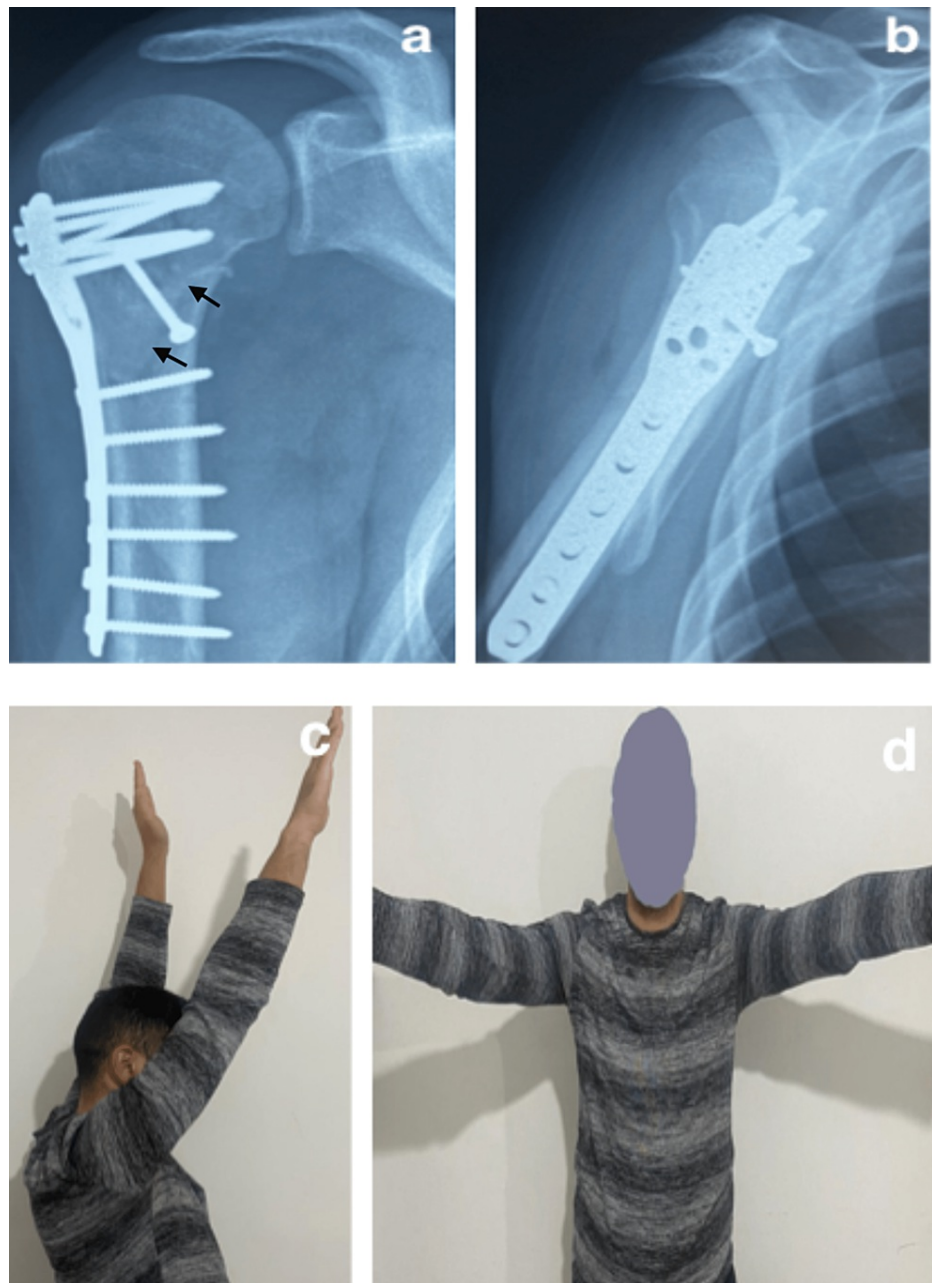
**FIGURE 3: CT scan of the right shoulder after the trauma shows the three-dimensional reconstruction slices (a-d), axial slice (c), and a complex three-part posterior fracture (red arrow) with dislocation (black arrow) of the right shoulder.**

Surgical management was performed under general anesthesia in a beach-chair position, using the deltopectoral approach. The first surgical step consisted of disengaging the proximal portion of the humerus blocked posteriorly. After debridement and adequate exposure, the reduction was obtained by traction in the axis of the upper limb, with disimpaction of the humeral head using a Kocher forceps from the belly of the deltoid muscle, we maintained fracture reduction provisionally with forceps. Then, we applied a direct screw perpendicular to the fracture line to approve the reduction. The second surgical step consisted of placing a locked plate just below the greater tuberosity and slightly behind the bicipital groove. We passed heavy sutures through the subscapular and supraspinatus tendons and through the plate to reduce the fracture fragments of the lesser tuberosity. Intraoperative and postoperative radiographs showed a good reduction of the fracture and the posterior shoulder dislocation (Figures 4a, 4b). The rehabilitation protocol was started on the second postoperative day, with pendular movements of the shoulder with flexion and extension of the elbow helped by the contralateral hand. In the third week, we started active movements (Figure 4c).



**FIGURE 4: Intraoperative (a), postoperative (b), and three-week radiographs showing good reduction of the posterior shoulder fracture-dislocation (black arrow).**

The patient's postoperative clinical and radiological evolution was closely monitored, and the results were favorable. Radiography of the shoulder at six weeks had objectified a complete consolidation (Figures [5a](#), [5b](#)). At the last visit, the patient was very satisfied (Figures [5c](#), [5d](#)) with a Constant score of 85/100 [9].



**FIGURE 5: (a, b) Radiographs at six weeks showing consolidation of the posterior fracture-dislocation (black arrow), (c, d) with satisfactory shoulder function at six months.**

## Discussion

The posterior dislocation fracture is a rare lesion. Despite its rarity in daily clinical practice, it remains an important diagnosis because it is observed, especially in young active patients, and often goes unnoticed [10]. It has been reported to escape diagnosis at the first examination in most cases, which leads to complications, such as stiffness, persistent pain, and thus the inability to perform the movements of daily life [11-13], not to mention the major risk of avascular necrosis of the humeral head if the reduction is not performed within 48 hours of the injury [5]. An early and thorough diagnosis associated with a complete radiological assessment is the key element for well-adapted management [14].

In the case of a suspected dislocation fracture of the shoulder, the authors recommend a series of three views, namely, anterior-posterior, scapular Y, and axillary. Nowadays, CT has become a valuable examination tool for confirming these types of lesions before any attempt at closed reduction [6,12] and helps in planning the surgical procedure [1,15].

The surgical management of posterior shoulder dislocation with fractures is a controversial issue as there are various therapeutic means that vary according to the age of the lesion and the percentage of defects of the humeral head, along with the patient's associated factors (such as age, history) [16]. Early open anatomical reduction and stable internal fixation remain the optimum treatment option for young and active patients, arthroplasty is often the last resort, particularly in cases of avascular necrosis, humeral head complex fracture, or undiagnosed posterior shoulder dislocation. Several approaches have been described by the authors for this type of lesion, with the deltopectoral approach being the most commonly used, especially to expose the anterior glenohumeral joint [1], which we used in our patient. The posterior approach is frequently used in dislocations with a significant defect of the humeral head [17]. It is known widely that the crucial factor in avoiding capsular contracture and the subsequent shoulder stiffness that follows the surgical treatment of a proximal humerus fracture is prompt initiation of motion and rehabilitation.

In our case, as the patient was young and active, we adopted an early open anatomical reduction and internal fixation while ensuring a good and immediate rehabilitation which explains the favorable outcomes.

## Conclusions

Posterior shoulder fracture-dislocations are rare injuries. The key components of well-adapted management are an early physical examination and a complete radiological workup. The optimum treatment option for this kind of fracture in young and active patients remains open reduction and stable internal fixation.

## Additional Information

### Disclosures

**Human subjects:** Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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