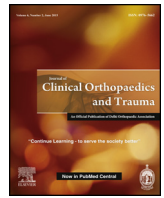




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## Case report

# Intrathoracic fracture–Dislocation of the shoulder

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### ABSTRACT

Intrathoracic dislocation of the shoulder is a rare condition that usually occurs after high-energy trauma. Etiology, mechanism of injury and associated lesions are diverse. We present the case of a patient who suffered a great height fall, treated with removal of the humeral head and implantation of a shoulder hemiarthroplasty. One year after the surgery, the patient was pain free and the Constant score was 70 points.

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## 1. Introduction

Intrathoracic fracture–dislocation of the humeral head is a very rare entity. The early description belongs to Watson-Jones,<sup>1</sup> who referred to some cases published in the German literature in 1865. West<sup>2</sup> in 1949, and Glessner<sup>3</sup> in 1961, would be who reported the first international articles of this injury. Henceforward, only about twenty cases have been described in the literature.

The aim of this paper is to review the published cases to determine etiology, mechanism of production, associated injuries and treatment of this serious injury.

Below, we present the case of a 60 years old woman who suffered an intrathoracic fracture–dislocation of the humeral head after a great height fall.

## 2. Case presentation

We present the case of a 60 years old woman who suffered an accidental six meters fall in the countryside. She injured her left shoulder presenting local tenderness and loss of function. Also blunt chest trauma occurred with respiratory distress. She did not address any prior medical history.

On arrival at our hospital the patient was awake and oriented, hemodynamically stable, with an oxygen saturation of 89%, without oxygen therapy. Furthermore, subcutaneous emphysema was detected on the left costal grill and pain increased concomitantly with breathing movements.

In the nerve examination of the extremity no alteration was found. Radial and ulnar pulses were present.

Laboratory studies showed mild leukocytosis with neutrophilia and hemoglobin level of 11 g per deciliter, as only significant findings.

In a standard radiographic study of the left shoulder, a four-part fracture–dislocation of the proximal humerus was observed, being the humeral head displaced intrathoracically (Fig. 1). Here, a CT scan was performed showing a marked medial displacement of the humeral head besides the second rib fracture and a left lung hemopneumothorax (Fig. 2).

Following forty-eight hours in the intensive care unit where the patient was stabilized, we proceeded to the surgery. Firstly, through axillary thoracotomy, the humeral head was removed and a chest tube was left in collaboration with a thoracic surgeon. No rib fixation was performed. Afterwards, through deltopectoral approach, a cemented hemiarthroplasty (Global-FX. DePuy®) was implanted and tuberosities were anatomically reduced and fixed (Figs. 3 and 4). Forty-eight hours after the surgery, the patient was allowed to perform passive rehabilitation exercises. Five days after the surgery, she was discharged from our hospital remaining respiratory stable and continuing rehabilitation treatment on an outpatient basis.

One year after the surgery, the patient was pain free. Her shoulder range of movement (ROM) consisted of: flexion 120°, abduction 100°, internal rotation 30° and external rotation 50° (Fig. 5). These values in ROM made her independent in activities of daily living. The postoperative Constant score of the patient was 70 points.

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Fig. 1. Radiographic study showing the intrathoracic fracture dislocation.

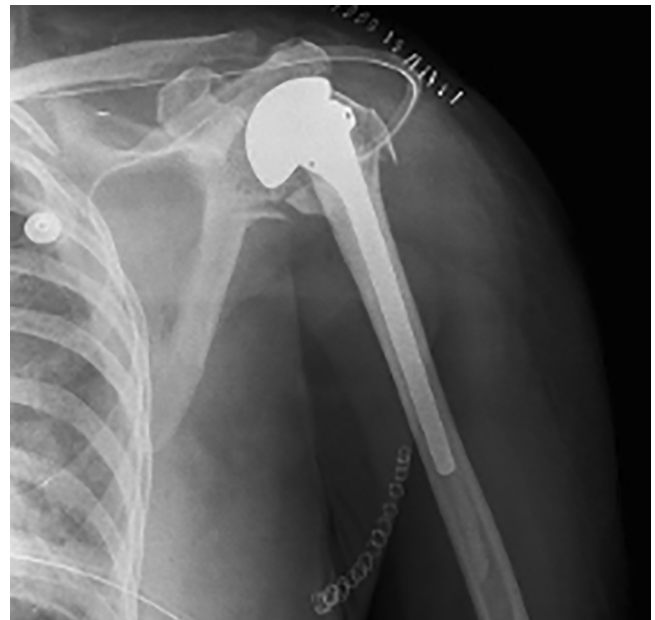


Fig. 4. Radiographic study showing the hemiarthroplasty. Note the second rib fracture.

### 3. Discussion

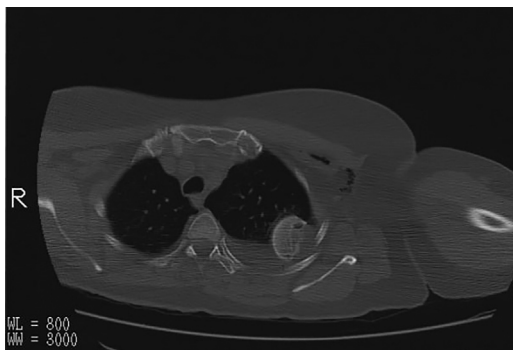


Fig. 2. CT-scan showing the intrathoracic localization of the humeral head.

The early description belongs to Watson-Jones,<sup>1</sup> who referred to some cases published in the German literature in 1865. West<sup>2</sup> in 1949, and Glessner<sup>3</sup> in 1961, would be who reported the first international articles of this injury. Henceforward, only about twenty cases have been described in the literature.

Intrathoracic fracture-dislocation of the humeral head is a rare injury that requires the conjunction of a high energy trauma, combined with a specific mechanism.

Enumerating the mechanism of injury, we can review 16 falls from height (same mechanism of our case),<sup>2,4–11,13–19</sup> one fall of a bicycle,<sup>12</sup> five motor vehicle accidents,<sup>20–24</sup> and two were knocked down by a motor vehicle.<sup>25,26</sup> Two exceptions can be made regarding the mechanism of high energy: the cases published by Griffin et al. and Salhiyyah et al. in which the injury was a fall from standing height.<sup>28,28</sup>

The fracture mechanism was raised by Hardcastle et al. in 1981, who suggested two stages for the injury to occur.<sup>29</sup> First a drop in forced abduction with external rotation causing dislocation and moves the humeral head toward the chest. Subsequently, a sharp adduction causes fracture of the humeral head. Glessner and Patel, previously (1961 and 1963), had suggested a similar mechanism, in which a forced abduction dislocated the shoulder into the chest cavity, and in the process of impact against the ribs would be when the fracture took place.<sup>3,4</sup>

Karr et al., suggested another possible mechanism of injury. It is a fall on the hand with the elbow extended that causes the fracture and dislocation of the humeral head, followed by a lateral impact on the shoulder resulting in fracture of the ribs and the entry of the head fragment into the chest.<sup>6</sup>

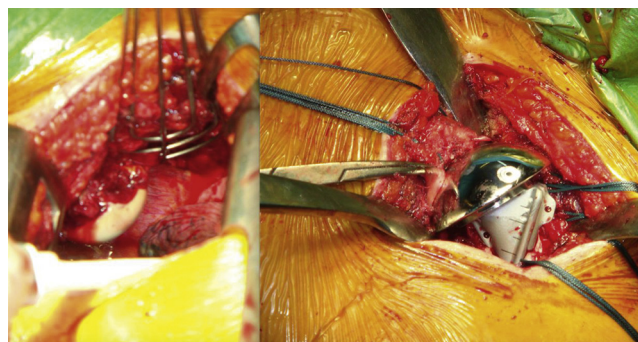


Fig. 3. Intraoperative images showing the humeral head and the hemiarthroplasty replacement.

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