

## Unusual presentation of more common disease/injury

## Exact moment of bilateral scapular fracture during skydiving captured on video

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### Summary

A skydiving athlete suffered bilateral scapular fracture while jumping from the plane. A camera showed the exact moment of fracture. The injury seemed to occur during hyperextension of the arms; however, the most common mechanism of fracture is during direct trauma of the shoulder. The patient was treated by immobilisation with a sling for 3 weeks and had a good outcome. Clinical and radiographic consolidation occurred 8 weeks after the injury. The athlete returned to competitive activities after 4 months.

### BACKGROUND

Scapular fractures are rare, accounting for approximately 1% of all fractures and 5% of shoulder fractures. Scapular fractures are generally the result of a high-energy trauma with a high incidence of significant associated injuries (local and remote). These associated injuries are often major, multiple and sometimes life threatening, therefore requiring priority in treatment.<sup>1</sup>

There are few reported cases of scapular fractures resulting from indirect trauma caused by muscular contractions, especially in athletes.<sup>2,3</sup>

This case report aims at demonstrating the exact moment when a skydiver suffered bilateral scapular fracture while jumping, with no history of direct trauma, and the subject presented a good outcome after non-surgical treatment.

### CASE PRESENTATION

The authors describe a case of a 49-year-old male patient, who had been a skydiver for a long time and felt a severe pain after jumping. The subject reported that during

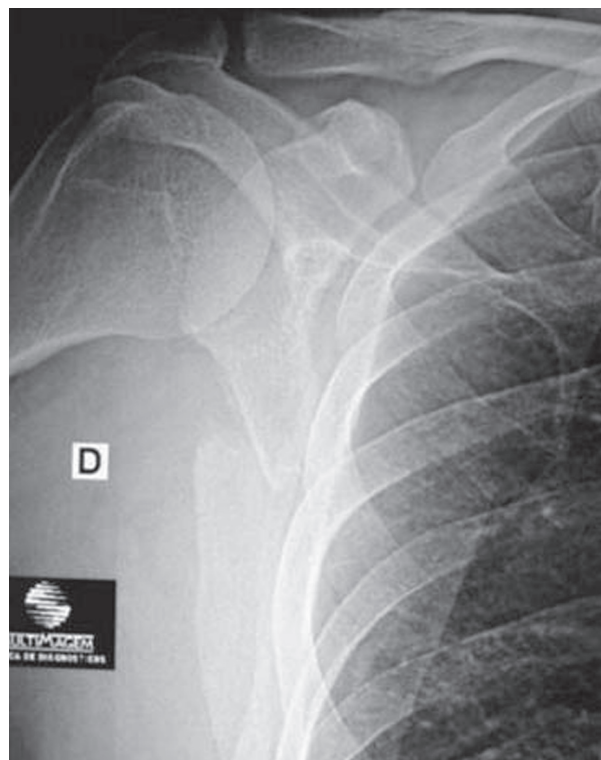
hyperextension of the upper limbs, after exiting the plane, he felt a snap (figure 1). In sequence, he completed the jump as usual by opening the reserve parachute (video 1). Despite the pain, the subject did not show a deficit of motion or deformity in the shoulder.

#### Video 1 The exact moment of injury.

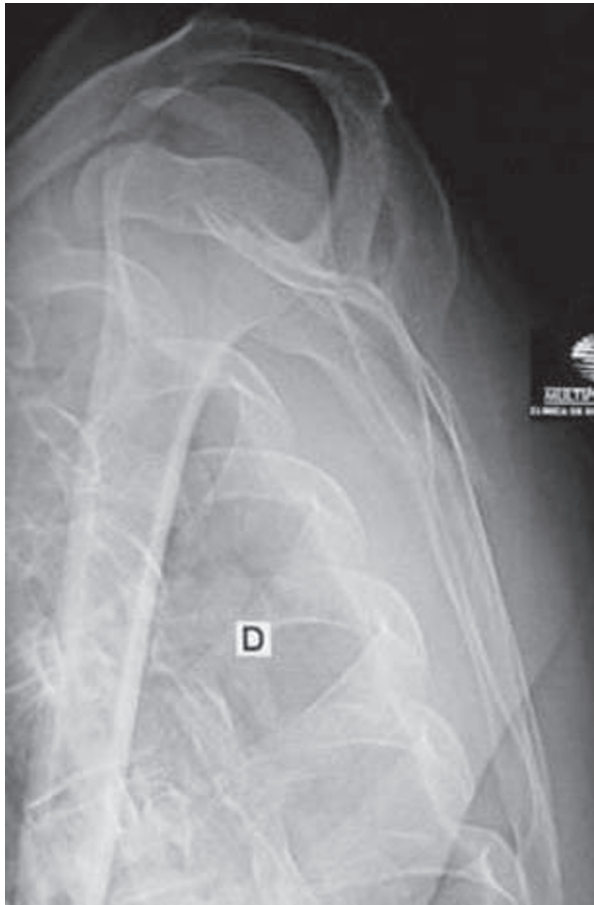
Radiographs showed bilateral scapular body fracture, without any evidence of damage to the articular surface (figures 2–5). CT scan highlighting the radiographic findings



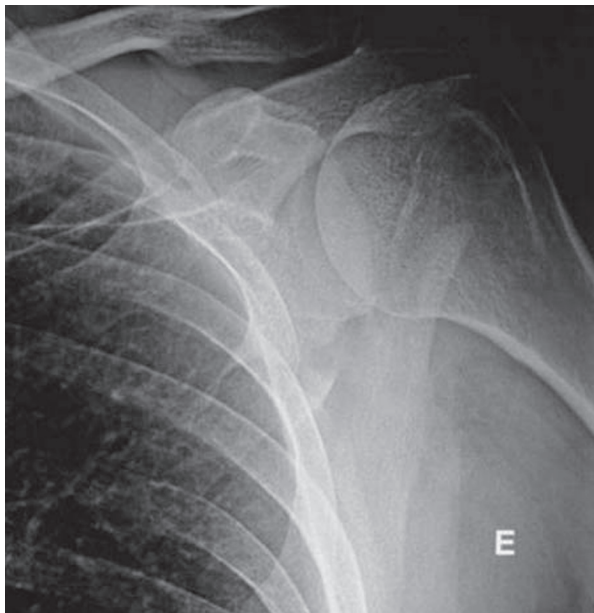
**Figure 1** Exact moment of fracture during hyperextension of the upper limbs.



**Figure 2** Right shoulder radiographic anterior view – scapular extra-articular fracture.

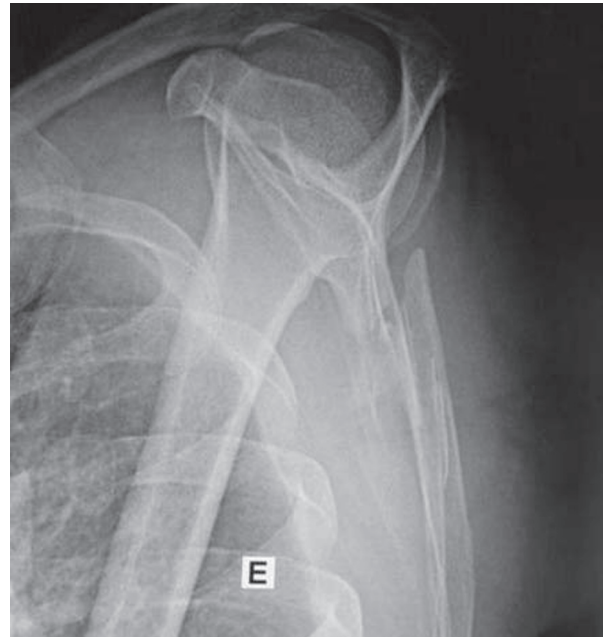


**Figure 3** Right shoulder radiographic lateral view – scapular extra-articular fracture.



**Figure 4** Left shoulder radiographic anterior view – scapular extra-articular fracture.

showed comminution of the fracture on the scapular body, which was more intense on the left shoulder (figures 6–8).



**Figure 5** Left shoulder radiographic lateral view – scapular extra-articular fracture.



**Figure 6** Tridimensional right shoulder CT scan (anterior view) highlighting the radiographic findings showed comminution of the scapular body.

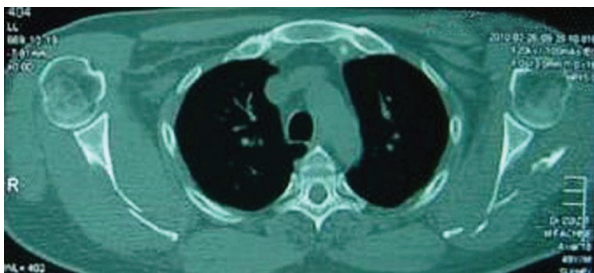
Before the examinations, we opted for a non-surgical treatment of the fracture and the patient was immobilised by a sling for 3 weeks.

#### OUTCOME AND FOLLOW-UP

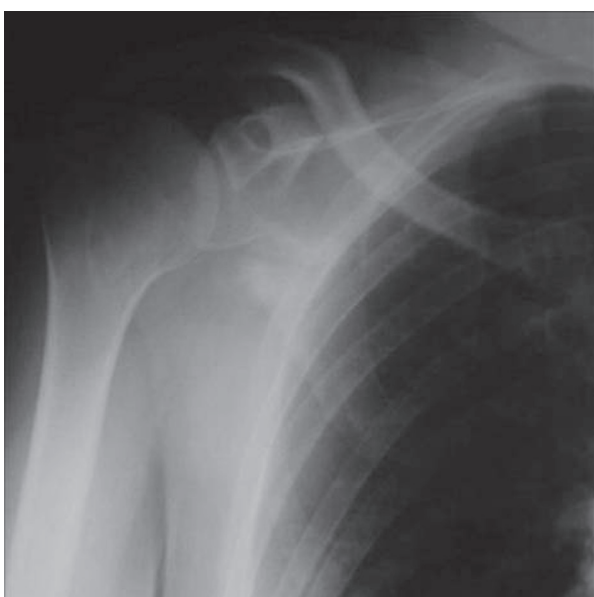
With the improvement of pain symptoms, the subject began physical therapy to gain range of motion, and the patient was well, asymptomatic and with radiographic consolidation of the fractures at a period of 8 weeks after the accident (figures 9–12).



**Figure 7** Tridimensional left shoulder CT scan highlighting the radiographic findings showed comminution of the scapular body.



**Figure 8** CT scan (axillary view) highlighting the radiographic findings showed comminution of the scapular body, no articular damage.



**Figure 9** Right shoulder anterior view – fracture consolidation after 8 weeks.



**Figure 10** Left shoulder anterior view – fracture healing after 8 weeks.

The general role of the scapula in athletic function is often misunderstood. This can lead to a failure in correctly diagnosing a shoulder problem.<sup>2</sup>

Most scapular fractures are the result of high-energy macrotrauma and are usually associated with more serious injuries.<sup>1–7</sup> However, in this case, there was no additional injury. The authors believe that hyperextension of the upper limbs caused traction of the periscapular muscles, which was the reason for the referred fracture.

Evaluation of the scapula is often difficult because of the complex nature of scapular function and should be performed from a posterior aspect. Abnormalities of winging, elevation or rotation may be first examined in a resting position. Local tenderness, swelling, haematoma formation over the fracture site and pain with movement of the shoulder are often clearly visible signs during physical examination.<sup>2</sup> Nevaizer described weakness around the shoulder joint that mimics rotator cuff injury as ‘pseudorupture’ of the rotator cuff secondary to haemorrhage, pain and loss of scapular integrity. Our patient reported severe pain and weakness, but no oedema or ecchymosis.

High-quality radiographic imaging (shoulder trauma series including the anteroposterior, lateral and axillary views) and CT scan are very important in order to decide the correct approach to the treatment of the patient.

Surgical treatment is indicated in cases where displacement of the glenoid fossa is greater than 5 mm, displacement of the glenoid rim is greater than 10 mm or disruption of the superior shoulder suspensory complex is present (reviewed by Goss).<sup>1,2,8</sup>

Translation of the glenoid neck greater than 1 cm or angulation greater than 40° is a surgical indication.<sup>1</sup> Surgical fixation may also be recommended for athletes with avulsion fractures of the coracoid tip. Even in cases with significant



**Figure 11** Physical examination – normal range of motion (elevation).



**Figure 12** Physical examination showing recovery of the range of motion.

displacement, fractures have healed well and rarely leave patients with shoulder disability.<sup>29</sup>

In our study, the patient suffered minimal displacement and was treated in non-surgically. He made a complete recovery in both shoulders after 3 weeks of immobilisation and returned to practicing sports after 4 months of the injury.

With the improvement of pain symptoms, the subject began physical therapy to gain range of motion, and the patient was well, asymptomatic and with radiographic

consolidation of the fractures at a period of 8 weeks after the accident (figures 9–12).

**Competing interests** None.

**Patient consent** Obtained.

## Learning points

- ▶ Indirect trauma/traction movement can produce scapular fractures.
- ▶ The periscapular muscle contraction can pull bone insertions causing fractures.
- ▶ The video captured showed the exact moment of the fracture.
- ▶ Conservative treatment produces good functional outcomes in scapular fractures.

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