

# Pure Intrathoracic Scapular Dislocation

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## Abstract

Scapular dislocation, also known as locked scapula or scapulothoracic dislocation, is a rare entity that can be identified as extrathoracic or intrathoracic dislocation, depending on the penetration of the scapula into the thoracic cavity.

The 3 reported cases of intrathoracic scapular dislocations in the literature are associated with a preexisting condition, such as sternoclavicular separation, prior rib fracture, thoracotomy for a lung transplant procedure, or surgical resection of superior ribs during breast or pulmonary tumor excisions. There are also 3 published cases of intrathoracic scapular impaction, involving comminuted scapular fractures with intrathoracic impaction of the inferior fragment through intercostal space.

We report an intrathoracic scapular dislocation that was not associated with fracture of the scapula or predisposing factors. To our knowledge, this is the first case of pure intrathoracic dislocation.

Scapular dislocation, which is also termed *locked scapula* or *scapulothoracic dislocation*, is an unusual condition that can be described as extrathoracic or intrathoracic dislocation, depending on the penetration of scapula into the thoracic cavity.

There have been 3 reported cases of intrathoracic scapular dislocations in the literature,<sup>1-3</sup> all associated with a preexisting condition (eg, sternoclavicular separation, prior rib fracture, thoracotomy for a lung transplant procedure, or surgical resection of superior ribs during breast or pulmonary tumor excisions). Three published cases of intrathoracic scapular impaction involve comminuted scapular fractures with intrathoracic impaction of the inferior fragment through intercostal space.<sup>4-6</sup>

Here we report an intrathoracic scapular dislocation that was not associated with fracture of the scapula or predisposing factors. To our knowledge, this is the first case of pure intrathoracic dislocation. The possibility of intrathoracic scapular dislocation should be considered as part of the differential diagnosis even in patients with a negative anamnesis for predisposing factors, such as lung or chest surgery. The patient provided written informed consent for print and electronic publication of this case report.

## Case Report

A 29-year-old woman presented to the emergency department after a motor vehicle accident. She had tenderness over the left shoulder and left elbow with decreased range of motion; however, motor and sensory examination of the wrist and fingers were normal. No distal neurovascular deficit was noted.

Physical examination revealed pain on pelvic compression. We observed an asymmetrical appearance between shoulders; the left shoulder was superior when compared with the right side (Figure 1). Palpation of the scapula aggravated the pain. The inferior angle of the left scapula was not palpable, and the medial border was palpated through the intercostal space between the third and fourth ribs.

Initial radiographs showed additional left olecranon and bilateral ramus pubis fractures. A chest radiograph showed non-

Figure 1. Appearance of the patient. Note the asymmetry between shoulders.



displaced fractures of the second and third ribs without any obvious hemothorax or pneumothorax. No other pathology involving the chest, such as resection of the ribs or congenital anomaly, was observed. The patient reported no history of thoracic trauma or lung surgery. There were no fractures of the scapula, humerus, or clavicles. Thoracic computed tomography was performed, and

Figure 2. Three-dimensional computed tomography reconstruction clearly shows the intrathoracic dislocation of the left scapula.



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3-dimensional (3D) reconstruction showed that the inferior angle of scapula penetrated into the thoracic cavity through the third intercostal space (Figure 2).

Given the intrathoracic scapular dislocation diagnosis, closed reduction under sedation was planned. The patient was placed in the supine position, and reduction was performed by applying pressure on the shoulder anteriorly. This maneuver increased deformity. At the same time, another physician pulled the spine of the scapula superiorly, releasing the scapula out of the thoracic cavity. When the arm was slightly lowered to neutral position, scapular deformity was no longer present (Figure 3). A shoulder sling was applied, and the patient was hospitalized for surgical fixation of pelvic and olecranon fractures. The arm was immobilized in a sling for 1 week, and shoulder exercises were started immediately afterward.

At 1-month follow-up, full shoulder range of motion was achieved, although rehabilitation for the elbow continued. Final follow-up examination at 4 months revealed no difference between shoulders, and no recurrence occurred.

### Discussion

Intrathoracic scapular dislocation is a rare injury. There are only a few cases reported in the literature, and most of them are well associated with a predisposing factor. Nettrour and colleagues<sup>1</sup> described the first intrathoracic scapular dislocation, which occurred 6 weeks after sternoclavicular separation and fracture of a rib. In the case reports of Ward and colleagues<sup>2</sup> and Fowler and colleagues,<sup>3</sup> the predisposing factor was resection of the ribs due to pancoast tumor and breast carcinoma, respectively. The mechanism of these dislocations depends on a weak area over the thoracic cage, creating a fulcrum point for levering the scapula into the thoracic cavity.

There are other cases of scapular dislocations that are accompanied by a comminuted fracture of scapula; a review of the literature revealed 3 cases.<sup>4-6</sup> In our opinion, fracture of the inferior pole of the scapula leads to injury of the soft tissues and also results in intrathoracic impaction by creating a weak area over the thoracic cavity. This mechanism

can be referred to as penetration.

Our case is singular because it is the first case that is not associated with fracture of the scapula or predisposing factors. Consequently, we report the first pure intrathoracic scapular dislocation in the literature. It is important to suspect intrathoracic scapular dislocation in the case of deformity (Figure 1), even in the absence of any predisposing factors or scapular fracture.

Although plain radiographs may not be elucidative, 3D reconstruction of computed tomography (Figure 2) reveals the pathology and plays an important role in guiding treatment.

In the treatment of our patient, relying on the unique dislocation mechanism without any fracture of the scapula or ribs, we started early active shoulder movement after 1 week of immobilization in a shoulder sling, which prevented recurrence of dislocation. In addition to presenting the first pure intrathoracic scapular dislocation, this case demonstrated satisfactory clinical results with short-term immobilization and early rehabilitation.

### Conclusion

Contrary to the literature, the possibility of intrathoracic scapular dislocation should be considered in the differential diagnosis even in patients with a negative anamnesis for predisposing factors, such as lung or chest surgery, and when no fractures are detected. Shoulder or thorax computed tomography, especially 3D reconstructions, are helpful in diagnosing the condition and in guiding treatment. Closed reduction under sedation followed by early rehabilitation is an appropriate treatment method, which resulted in a full return of function in 1 month in our patient.

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Figure 3. Appearance of the patient after reduction; compare with Figure 1.

*This paper will be judged for the Resident Writer's Award.*