

## Unusual presentation of a spontaneous fracture of a first rib: a case report

*Nadir bir birinci kaburga spontan kırığı: Olgu sunumu*

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Spontaneous fractures of the first rib are rare. In this article, a 16-year-old male, with a spontaneous first rib fracture, was reported. Most fractures in the first rib occur at the subclavian groove which is the thinnest and weakest portion of the rib. However, in this case the fracture occurred at an uncommon region, posterior to the insertion of the scalenus medius muscle, in the first rib. Patient was presented with a mass lesion at posterior part of the right first rib which was discovered accidentally on chest X-ray done for medical follow-up.

*Key words:* Chest pain/therapy; magnetic resonance imaging; rib fracture/diagnosis.

Spontaneous fractures of the first ribs are rare.<sup>[1]</sup> Most cases are stress fractures that occur at the subclavian artery groove, which is the thinnest and weakest portion of the rib, between the attachments of the scalenus anterior and scalenus medius muscles.<sup>[1,2]</sup> We report the case of a young male with a stress fracture of the first rib located uncommonly at the posterior portion of the rib that presented as a first rib mass.

### CASE REPORT

A 17-year-old male student, who was right-handed, was referred to our unit for investigation of a right first rib mass which was discovered accidentally on follow-up chest X-ray after an episode of pneumonia. He had no history of trauma to the shoulder girdle. On physical examination, the patient had no atrophy of his chest or upper extremity muscles, either anteriorly or posteriorly. No pain could be elicited with breathing or with arm movement. The ranges of motion of both shoulders were normal. No tenderness was

Birinci kaburganın spontan kırıkları nadir görülür. Bu makalede, spontan birinci kaburga kırığı olan 16 yaşında bir erkek hasta sunuldu. Birinci kaburganın kırıklarının çoğu, kaburganın en ince ve en zayıf bölümü olan subclaviyan olukta meydana gelir. Bununla birlikte, bu olguda kırık birinci kaburgada nadir bir bölgede, scalenus medius kasının yapıldığı bölgenin posteriorunda meydana gelmiştir. Hasta sağ birinci kaburgasında tıbbi takip için çekilen bir göğüs filminde şans eseri tespit edilen bir kitle lezyonuyla başvurmuş idi.

*Anahtar sözcükler:* Göğüs ağrısı/tedavi; manyetik rezonans görüntüleme; kaburga kırığı/tanı.

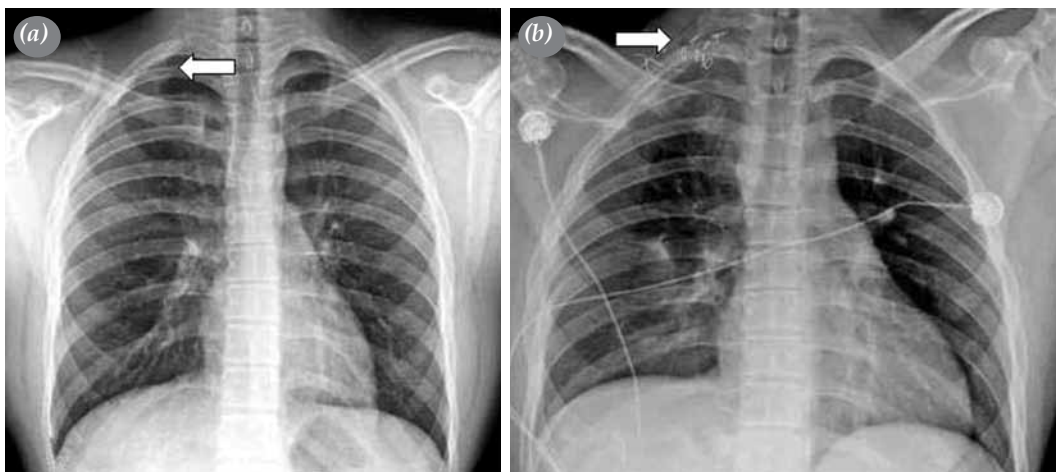
elicited with deep palpation in regions of the right anterosuperior chest or the superomedial border of the right scapula. Radiographs demonstrated a radio opaque mass lesion at the posterior part of the right first rib (Figure 1a). A computed tomography (CT) scan suggested a mass with rib destruction posterior to the insertion of the scalenus medius muscle. We considered it as a first rib neoplasm. A bone scan could not exclude a malignant lesion, and a biopsy of the lesion was not feasible.

We prepared the patient for surgical excision of the lesion. We used the supraclavicular approach to reach the lesion and excise it completely (Figure 1b and 2).

Pathological examination of the specimen demonstrated mature, trabecular bone tissue with a bone callus composed of hyaline cartilage and foci of ossification. Postoperatively, the patient had no discomfort in his shoulder girdle during any physical activity.

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**Figure 1.** (a) Preoperative chest X-ray showing the mass lesion situated posteriorly at the right first rib (arrow). (b) Postoperative chest X-ray showing the defect left after surgical resection of the mass lesion of the right first rib (arrow).

## DISCUSSION

Previous reports have fully described the anatomical features of the first rib and the causes of stress fractures of the rib. The groove for the subclavian artery is the most common location for stress fractures.<sup>1,2</sup> Our case demonstrated a healing fracture of the first rib that was uncommonly located at the posterior portion of the rib distal to the insertion of the scalenus medius muscle. There have been few reports of a spontaneous stress fracture<sup>3,4</sup> at this same site. However, the mechanism for fractures of the first rib at this location is unclear. Gregory et al.<sup>5</sup> reviewed the clinical aspects of stress fractures of the first rib. The onset is usually insidious, although it can start with sudden acute pain. There may be tenderness either medial to the superior angle of the scapula, at the root of the neck, at the supraclavicular triangle, or deep in the axilla. Shoulder movements

may be painful or restricted. Plain chest radiographs are usually initially negative, and diagnosis requires CT or magnetic resonance imaging (MRI). The recommended treatment for a first rib stress fracture involves immobilization of the shoulder girdle on the affected side with a sling and adequate analgesia. Long-term follow-up with serial radiographs for six months is advised to assess late-developing complications. Our case had a different presentation. The patient was asymptomatic and presented as a first rib neoplasm. Radiological studies could not rule out a malignant bone lesion, so it was dealt with surgically as a first rib tumor.

In conclusion, spontaneous first rib fractures are rare. They can be asymptomatic and present as a bone mass lesion. Difficulties can be encountered in establishing a precise diagnosis of first rib fractures, and sometimes surgical resection is the only feasible way to obtain an accurate diagnosis and rule out tumors.

## Declaration of conflicting interests

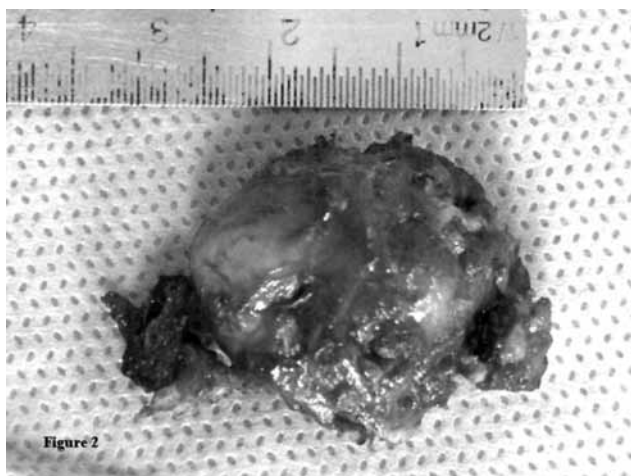
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**Figure 2.** Excised mass with a part of the first rib.

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