

## Intrathoracic rib: a case report\*

Costela intratorácica: relato de caso

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**Abstract** Intrathoracic rib is defined as a rare congenital anomaly, possibly caused by an incomplete fusion of cephalic and caudal processes of sclerotomes during embryogenesis. Frequently, such abnormality is incidentally found, but may be associated with vertebral malformation and some symptoms such as chest pain. The authors report the case of a patient with left-sided intrathoracic rib in association with vertebral malformation, with a non-specific clinical picture.

**Keywords:** Intrathoracic rib; Costal anomaly; Computed tomography.

**Resumo** Costela intratorácica é definida como uma anomalia congênita rara, possivelmente causada por uma fusão incompleta dos processos cefálico e caudal dos esclerótomos durante a embriogênese. Frequentemente é achado incidental, porém, pode estar associada a malformações vertebrais e a alguns sintomas como dor torácica. O quadro apresentado é de costela intratorácica à esquerda, associada a malformação vertebral, com quadro clínico inespecífico.

**Unitermos:** Costela intratorácica; Anomalia costal; Tomografia computadorizada.

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### INTRODUCTION

Anatomic rib variants are found in 2% of the population<sup>(1)</sup> and include bone dysplasias, focal abnormalities, cervical rib, intercostal synostosis, bifid anterior extremity, either in association or not with thoracic vertebral malformations. Intrathoracic rib was first described in 1947 by Lutz, and since then it is presented as a rare, generally symptomatic congenital abnormality, most of times diagnosed as an additional finding at chest radiography<sup>(2-4)</sup>. However, in cases where the abnormality arises from a vertebral body, the diagnosis by conventional radiography becomes more difficult and in such cases computed tomography (CT) is required, principally for diagnostic differentiation from hilar or mediastinal masses<sup>(5-7)</sup>.

### CASE REPORT

Female, 51-year-old patient with left-sided sharp chest pain for approximately

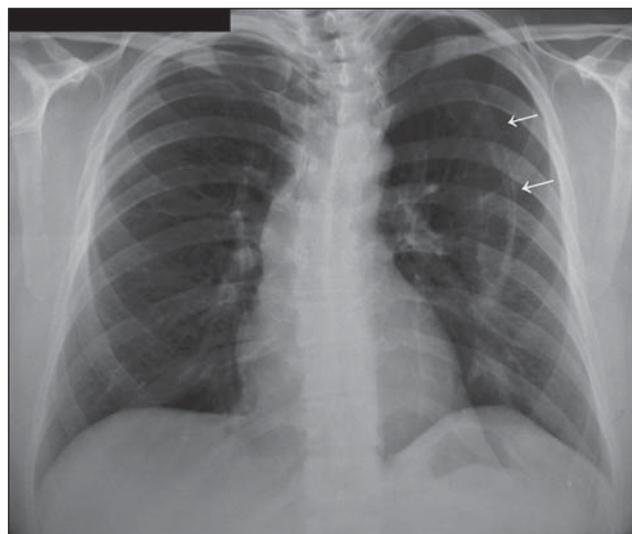
two years with progressive development to cervicobrachialgia associated with a subtle thoracic scoliosis. After consultations with an orthopedist and recurrence of the painful condition, radiography of the chest and cervical spine was requested to elucidate the diagnosis.

Chest radiography demonstrated bone density image, with bone cortex and medulla, lateral convexity, progressive reduction of craniocaudal dimensions, located in the upper and middle thirds of the left hemithorax, associated with thoracic scoliosis (Figure 1). Once the presence of intrathoracic rib was observed, CT was suggested for a better evaluation. With the

aid of 3D reconstruction, it was possible to thoroughly visualize a vertical bone image joining the fourth rib posteriorly at left (Figure 2), better identified on oblique view (Figure 3). Coronal reconstruction of the thoracic spine allowed characterization of dextroconcave scoliosis in association with structural deformity at T4-T5 level (Figure 4).

### DISCUSSION

Despite the 45 cases reported in the English literature<sup>(4)</sup>, the mechanism of development of such anomaly is still to be understood. The most accepted hypothesis



**Figure 1.** Chest radiography. Posteroanterior view demonstrating bone density image with bone cortex and medulla, lateral convexity, progressive reduction of craniocaudal dimensions, located in the upper and middle thirds of the left hemithorax, associated with thoracic scoliosis.

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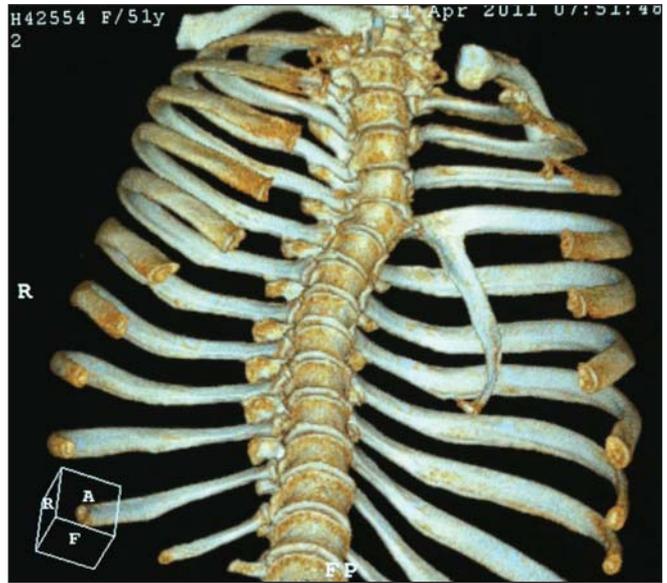
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**Figure 2.** Computed tomography 3D reconstruction demonstrating vertical bone image joining the fourth rib posteriorly at left.



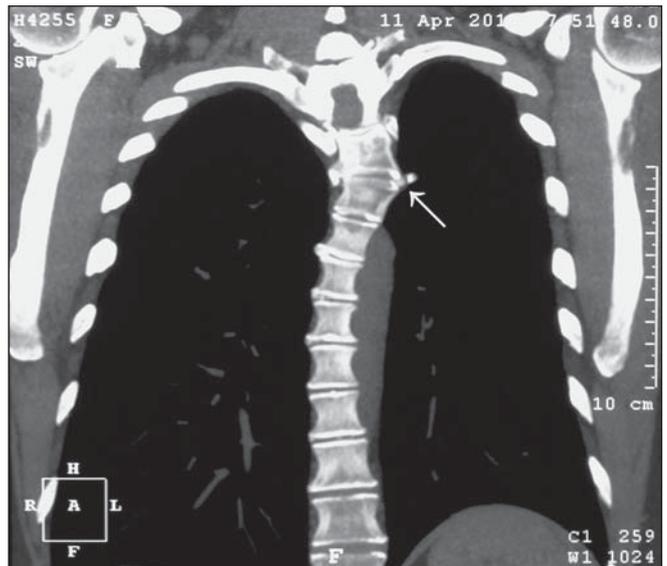
**Figure 3.** Computed tomography 3D reconstruction. Oblique view providing a better visualization of the bone image insertion into the anteroinferior aspect of the fourth costal arch posteriorly.

would be that of a failure in the fusion of cephalic and caudal processes of sclerotomes between the fourth and sixth embryogenesis weeks<sup>(1,4)</sup>. With no sex prevalence, most frequently at right, and with morphology similar to a normal rib extending laterally downwards in the extrapleural space, intrathoracic rib may reach the diaphragm.

The range of differential diagnosis includes: exostosis, bone tumors, chest drain and calcified pleural plaques. The condition is generally asymptomatic, but chest pain and dyspnea have already been reported<sup>(3)</sup>. It is strongly suggested that the risk for pulmonary injury is enhanced if these patients are affected by chest trauma.

The early diagnosis based on either an additional finding or any sign/symptom related to the malformation is extremely relevant, principally because it rules out differentially diagnosed conditions which would require follow-up and a possible definitive treatment.

It can be affirmed that, in spite of being a rare malformation, intrathoracic rib is relatively easy to diagnose by means of conventional radiography in cases where it arises from an otherwise normal rib. However, in cases where the rib arises from a vertebral body, CT becomes essential for a correct diagnosis, avoiding not only un-



**Figure 4.** Computed tomography coronal reconstruction of thoracic spine showing dextroconvex scoliosis associated with structural deformity at T4-T5 level.

ecessary interventions, but also avoiding that differentially diagnosed conditions go untreated.

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