Scoliosis Secondary to an Unusual Rib Lesion

Abstract:
NG Burke, J Walsh, S McEvoy, E Heffernan, S Dудeney
Department of Orthopaedic Surgery, St Vincents University Hospital, Elm Park, Dublin 4

Tumours of the chest wall are uncommon and are usually malignant. A bone haemangioma is a rare benign vascular neoplasm, which more commonly occurs in middle-aged patients. We present the case of a scoliosis caused by a rib haemangioma in an adolescent male. Other causes of scoliosis secondary to rib lesions are discussed.

Case Report
A 16 year old boy was referred for further assessment by of a right-sided scoliosis. He complained of an aching back pain after exertion over a 2 year period previously, which had gradually worsened. He had no recent history of anorexia, night pain, sweats, or trauma. His mother had noticed a curvature in his spine that had got progressively worse over the last 9 months. He had no significant past medical or family history. On physical examination, he had a right thoracic curvature with a mild trunk shift to the right. He had no noticeable lordosis in the thoracic region, but was minimally tender over the posterior left lower rib region. He had no neurological deficit, including the presence of abdominal reflexes. A standing postero-anterior radiograph of the spine showed a right-side scoliosis with a Cobb angle of 40 degrees and a smoothly marginated, expansile, sclerotic lesion in the posterior aspect of the left 8th rib at the apex of the scoliosis as shown in Figure 1. CT chest showed diffuse sclerosis within the expansile rib lesion (Figure 2). The rib mass measured 7.2 x 3.7 x 4.0 cm. MRI of the thoracic spine was also performed. On T1-weighted imaging, there was extensive abnormal increased signal in the soft tissues of the left posterior chest wall. An isotope bone scan revealed no other skeletal abnormality. All laboratory studies including serum tumour markers were normal.

A CT guided biopsy of the rib lesion and the surrounding soft tissues was performed. Histology showed benign vascular proliferative features consistent with a cavernous haemangioma. The patient underwent a surgical resection of the rib lesion as an outpatient procedure. Post-operatively, the patient had no complications. This young boy is currently under review, and now at one year following surgery is doing well with no further progression of his scoliosis.

Discussion
The causes of scoliosis are classified broadly as congenital, idiopathic, neuromuscular, syndrome-related and spinal curvature due to secondary reasons. Scoliosis associated with rib pathology is uncommon, but has been reported previously with tumours such as an osteoblastoma and osteoid osteoma. This is the unique case of a 16 year old adolescent with a scoliosis secondary to a cavernous haemangioma of a rib. Rib tumours account for 6-10% of all primary bone neoplasms, with approximately half of these being malignant. Other causes of scoliosis secondary to rib lesions are discussed.

Figure 1: Chest radiograph shows moderate scoliosis of the thoracic spine secondary to a large, expansile sclerotic lesion in the posterior aspect of the left 8th rib (arrow).

Figure 2: Transverse CT image demonstrating the expansile rib lesion and abnormal low density throughout the soft tissues of the posterior chest wall (arrows). This abnormality contains both fat and soft tissue density components.

Cavernous haemangioma is one of the most common haemangioma variants to be found in bone, and is compromised of dilated intercommunicating vascular cavity lined by a single layer of endothelium cells separated by bony trabeculae. Radiologically, these are usually well demarcated lucent lesions, which in flat bones expand with a thin cortex giving a honeycomb or sunburst appearance. Sclerosis of these lesions may also occur as in this case study, and this may lead to difficulty excluding metastatic disease. The differential diagnosis of a rib lesion includes primary tumours and metastatic lesions. Malignant primary rib neoplasms such as chordosarcoma, osteosarcoma, and Ewing sarcoma must be considered, as well as benign lesions such as osteochondroma, enchondroma, fibrous dysplasia, eosinophilic granuloma and aneurismal bone cysts. Imaging is often not reliable for a definitive diagnosis, so it is important that a biopsy or wide excision resection is performed. A careful, complete evaluation of a patient with scoliosis is essential and should include an integrated clinical, radiographic and histological approach. Rib lesions should be considered as a secondary cause of the scoliosis, and if present the differential diagnosis should include a bone haemangioma.

References