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SPONTANEOUS HEMOTHORAX, A RARE FACE OF VERTEBRAL OSTEOCHONDROMA

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☐ **Abstract—Background: Osteochondroma is the most common benign tumor of the bone. It is usually asymptomatic, but complications may result from mechanical injury to adjacent anatomic structures, such as the diaphragm and lung, when located intrathoracically. Case Report: We report the unusual occurrence of a large hemothorax and lacerated right diaphragm in a 41-year-old woman caused by vertebral osteochondroma affecting the eleventh thoracic vertebra. Thoracoscopic exploration with resection of the osteochondroma and repair of the diaphragm was performed. Why Should an Emergency Physician Be Aware of This?: Spontaneous hemothorax is a potential life-threatening condition when the initial diagnosis is postponed and hemodynamic instability and hypovolemic shock occurs. Osteochondroma as a cause of spontaneous hemothorax is uncommon but may require urgent surgical intervention with video-assisted thoracoscopic surgery of thoracotomy to control the hemorrhage and prevent recurrence.**

☐ **Keywords—diaphragmatic injury; osteochondroma; spontaneous hemothorax; vertebral exostosis**

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INTRODUCTION

Hemothorax is in most cases related to chest trauma or has an iatrogenic cause (e.g., placement of central lines, thoracentesis, or pleural biopsy). Spontaneous hemothorax (SH) is much less common and typically associated with coagulopathies, vascular malformations, pneumothorax, or malignancy.

We report the unusual occurrence of a large hemothorax and lacerated right diaphragm in a 41-year-old woman caused by solitary vertebral osteochondroma.

CASE REPORT

A 41-year-old woman was admitted to the emergency department with acute right-sided pleuritic chest pain and progressive shortness of breath for 2 days. The patient denied any cough, fever, or trauma. Vital signs included a heart rate of 109 beats/min, blood pressure of 141/81 mm Hg, and a respiratory rate of 18 breaths/min. Her oxygen saturation was 98% on room air measured by pulse oximetry. The physical examination revealed decreased breath sounds at the right lower and midlung fields. No biochemical abnormalities were noted. Hemoglobin level at the time of admission was 13.2 g/dL (reference range, 12.3–15.3 g/dL). A chest radiograph revealed a large pleural effusion with compression atelectasis of adjacent lung tissue

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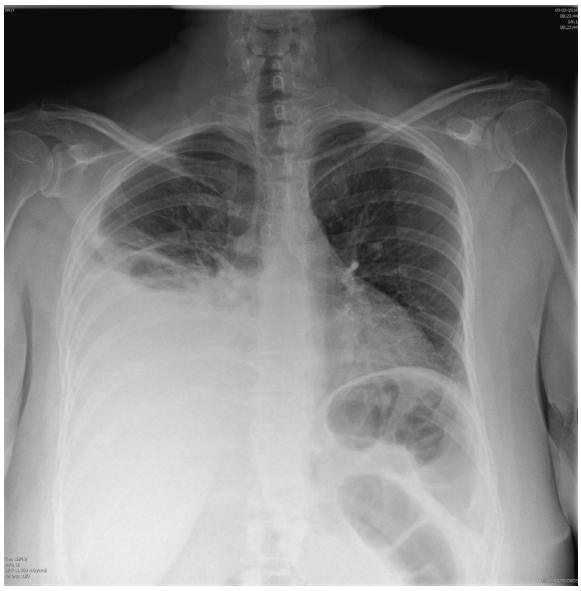

Figure 1. Chest radiograph showing right-sided hemothorax.

(Figure 1). Subsequent chest computed tomography (CT) scan showed a slight cardiomediastinal deviation to the left. Active arterial bleeding into the pleural cavity from a small diaphragmatic artery was detected (Figure 2), necessitating urgent thoracoscopic exploration. Intraoperatively, erosion of an osteochondroma on the lateral aspect of the vertebral body of T11 into the diaphragm was found. The surgical procedure consisted of hemostasis, resection of the granuloma along with the vertebral exostosis, and repair of the diaphragmatic erosion (Figure 3). The subsequent postoperative course was uneventful, and the patient was discharged home on postoperative day 4 without complications. After 4 months of follow-up, there was no evidence of any residual or recurrent hemothorax.

DISCUSSION

Hemothorax is often suspected in patients presenting with overt trauma to the chest wall. However, we present an occurrence of SH caused by a solitary vertebral exostosis or osteochondroma. Osteochondromas are the most common benign bone tumors (1). They arise from subperiostal displacement of epiphyseal growth plate cartilage. Persistent growth of this fragment and its subsequent enchondral ossification results in a subperiostal osseous excrescence with a protective "cartilaginous" cap. Osteochondromas have a predilection for the metaphyseal region of the long bones of the extremities (i.e., the femur, tibia, fibula, humerus, radius, and ulna) but have been reported to exist in a variety of other locations (i.e., the scapula, pelvis, ribs, clavicle, and vertebra) (2). They are usually solitary or appear as a manifestation of a genetic disorder (hereditary multiple exostosis), characterized by multiple osteochondromas during childhood and adolescence (1).

Osteochondromas are usually asymptomatic and present as a palpable mass. Pain and neurologic signs caused by compression of adjacent nerves may also occur (3). Malignant transformation into chondrosarcoma is rare in cases of solitary osteochondroma, but the incidence reported in patients with hereditary multiple exostosis in a recent study by Czajkais et al. is 2.7% (4).

Osteochondromas may become symptomatic through vascular complications. As a consequence of the frequency of osteochondroma in the lower extremity, vascular complications in the popliteal artery are well described (i.e., aneurysm, pseudoaneurysm, or thrombosis) (2). Patients with costal osteochondroma are at risk for intrathoracic vascular complications. Damage is thought to occur when the cartilaginous cap of the tumor begins to reabsorb during ossification, exposing the new

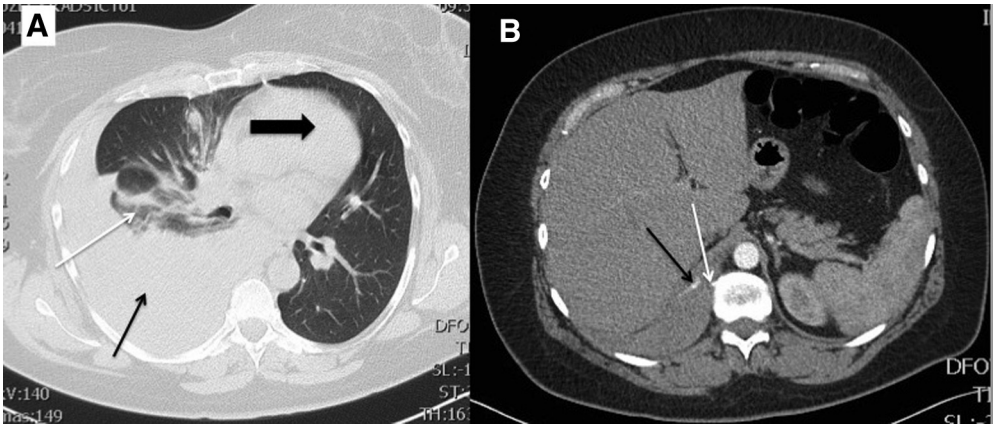

Figure 2. Computed tomography scan of the chest. (A) Hemothorax (small black arrow), compressed lung tissue (white arrow), mediastinal shift to the left (large black arrow). (B) Computed tomography scan showing the vertebral exostosis (white arrow) and zone of active bleeding on the diaphragm (black arrow).