CLINICAL VIGNETTE

When Back Pain is Osteosarcoma

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A 33-year-old female presented complaining of right upper back pain for three weeks. She noticed a lump in her right upper back which was growing in size and getting more painful. She described the pain as a dull ache with some radiation down her back. Extending her arms out made the pain worst. Nothing had relieved her symptoms, prompting her to come in for evaluation. Review of systems was negative for fevers, chills, numbness, tingling, or weakness in her extremities.

Vital signs were unremarkable. On physical exam, she was well appearing in no acute distress. She had a hard subcutaneous mass over her right posterior chest wall, 4x4 centimeters in diameter. There was mild tenderness to palpation over the mass. Her heart, lung, abdominal, and neurological examinations were unremarkable.

An x-ray of the right scapula, thoracic spine, and right ribs showed a mineralized mass which appeared attached to the inferior border of the ninth rib and possibly destroying parts of the tenth rib. CT scan of the ribs showed an expansile lesion affecting the posterior aspect of the tenth rib with a well-defined nonaggressive lytic central area. There was some soft tissue extension impressing upon the pleural surface but no soft tissue mass associated with the lesion and no pneumothorax. The findings were most consistent with fibrous dysplasia.

She was urgently referred to cardiothoracic surgery. PET scan showed an expansile right tenth rib lesion with focal areas of uptake considered nonspecific and possibly an atypical representation of fibrous dysplasia versus malignancy. There was no evidence of abnormal uptake in the chest, abdomen, or pelvis. A CT guided biopsy revealed atypical cells and giant cells. These cells are not typical of fibrous dysplasia. The atypical nature of the cells was concerning for malignancy, prompting a recommendation for an open biopsy or excision for definitive characterization. The patient underwent right video assisted thoracoscopic surgery with resection of multiple ribs. During the operation, there were extensive changes noted along the pleura, suggesting invasion. Pathology revealed high grade osteosarcoma.

Discussion

Osteosarcomas are rare, malignant bone tumors. They account for only one percent of all bone cancers diagnosed in the United States,[1] or about 1,000 new cases diagnosed each year.[2] In children, osteosarcomas are mainly sporadic. In adults, osteosarcomas are mostly considered secondary neoplasms, which can arise from sarcomatous transformation of Paget's disease or other benign bone lesions. Risk factors for developing osteosarcomas include prior radiation, Paget's disease, or having other benign bone lesions. In children, they are most commonly found in the distal femur, proximal tibia, and proximal humerus compared to adults, where osteosarcomas are more commonly found in the axial locations.[1]

Intermittent pain with or without the presence of a palpable mass is often the presenting symptom.[3] Systemic symptoms are usually absent. Laboratory values are usually normal. However, alkaline phosphatase, lactate dehydrogenase, and erythrocyte sedimentation rates can be elevated in some cases. Given its rarity, osteosarcomas are not usually high on the list of differential diagnoses when a young adult presents with acute back or rib pain. However, a hard palpable mass should prompt the clinician to pursue imaging so diagnosis is not delayed. A plain radiograph is the initial diagnostic step. Some classic radiological signs are destruction of the bone cortex, a mix of radiodense and radiolucent areas, and the presence of periosteal new bone formation. Regardless of radiographic findings, a biopsy is required for definitive diagnosis.

Prior to the utilization of systemic chemotherapy, the majority of patients with osteosarcoma would develop metastases and ultimately die from their disease. This was thought to be due to subclinical metastases at the time of diagnosis, which would go untreated with surgery of the primary site alone. Survival rates have improved dramatically with the use of adjuvant chemotherapy compared to surgery alone.[4] Therefore, chemotherapy is now a standard part of the treatment regimen for osteosarcoma.

Primary care physicians have a unique role in the practice of medicine as they are often the first ones to evaluate a wide range of symptoms. This case illustrates the need to always keep your list of differential diagnoses broad, as uncommon illnesses can often present with common symptoms.

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