A Man With Pain and a Large Nevus on His Thigh

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CLINICAL HISTORY

A 17-year-old male student was admitted for evaluation of left upper limb and back pain with fever of 5 months' duration. He was well until February before his admission, when he first experienced mild, intermittent right anterior thigh pain gradually increasing in frequency and severity. After 1 month, he experienced lower back pain and tenderness, especially about the sacroiliac joints. By June of the same year, he had developed similar pains in the left anterior thigh, both calves, and biceps muscles. He complained additionally of persistent headache, nausea, and fatigue. He had fevers and sweats the month before hospitalization and a 2.27-kg weight loss over the week prior to his admission.

PHYSICAL EXAMINATION

Blood pressure was 130/80 mm Hg; pulse, 72 beats per min; temperature, 98.6ºF; and respiration, 18 breaths per minute. He had palpable tenderness over the posterior lower left ribs and sacroiliac joints. A large, flat black nevus without obvious malignant change was identified over the right anterior thigh. The remainder of the examination was unremarkable.

RADIOGRAPHICAL FINDINGS

A posterior-anterior chest radiograph revealed a lytic lesion without sclerotic changes in the lateral left eighth rib (not displayed). An anterior-posterior radiograph of the skull displayed multiple areas of increased lucency in the frontal and parietal regions similar to those described in the pelvis (Figure 1). An anterior-posterior radiograph of the thoracic spine displayed compression fractures of the 6th, 10th and 11th thoracic vertebrae (Figure 2). Multiple biopsies were requested to determine the exact diagnosis: a cone-down anterior-posterior right pelvis at biopsy (Figure 3); anterior-posterior radiograph of the left ribs and scapula (Figure 4), and the anterior posterior pelvis post–open biopsy of the left ilium (Figure 5).

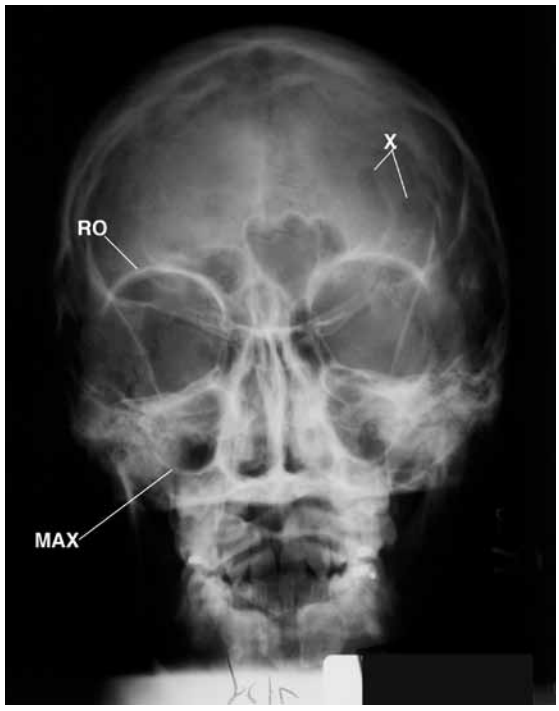
DIFFERENTIAL DIAGNOSIS OF LYTIC BONE LESIONS

- Infections: actinomycosis and blastomycosis
- Endocrine: osteitis fibrosa cystica generalisata
- Neoplastic: primary bone tumors, ie, multiple myeloma and metastatic bone tumors such as Hodgkin's disease, lymphoma, and leukemia; carcinomas of the lung, thyroid; breast, ovary, uterus, melanoma, gastrointestinal tract, and the kidney.

HOSPITAL COURSE

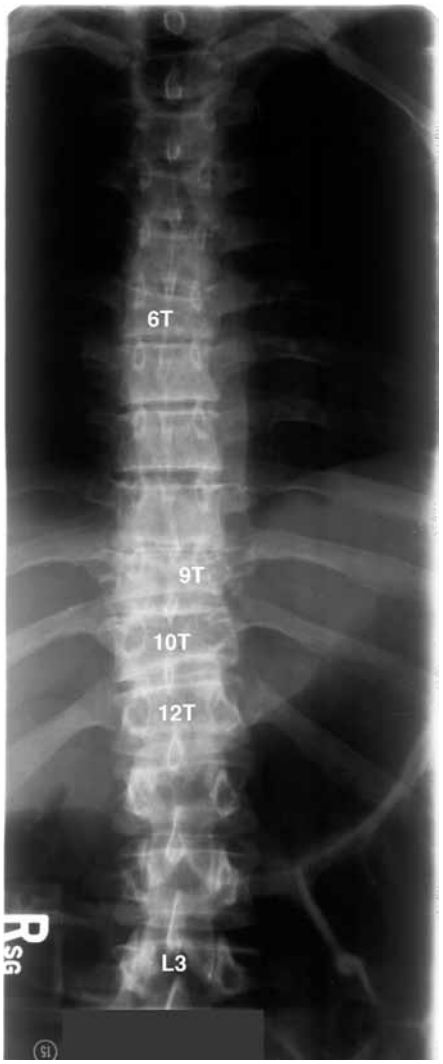
Percutaneous bone biopsies (bone and marrow) under fluoroscopic control were obtained of the right

Figure 1. Lytic Areas of the Skull Within the Left Frontal and Parietal Region (X)



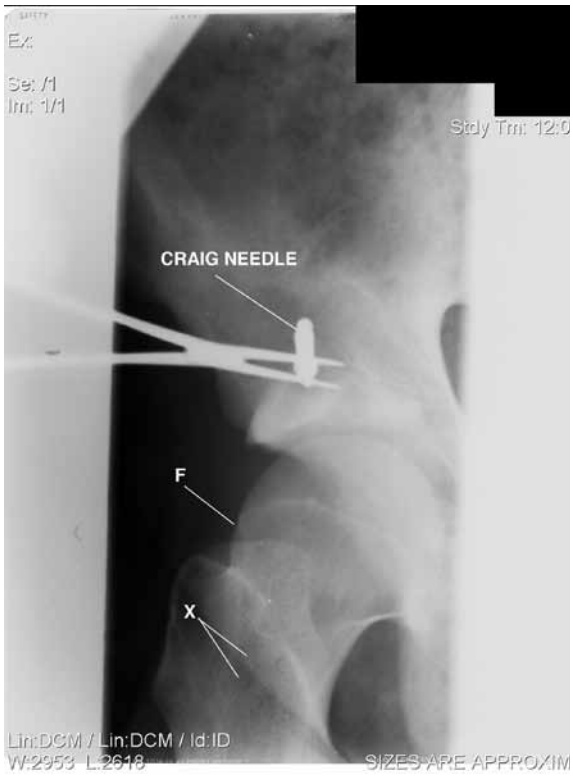
Landmarks of the right orbit (R0) and right maxillary sinus (Max).

Figure 2. Anterior-Posterior Radiograph Displays Thoracolumbar Spine With Lytic Destruction of Thoracic Vertebrae (6T, 9T, 10T, 12T)



Abbreviations: L3, third lumbar vertebra; R, right; RL, right lung.

Figure 3. Cone-Down Posterior-Anterior Radiograph of Right Pelvis Displaying the Craig Needle in Position for the Percutaneous Biopsy



Abbreviations: F, femur; X, lytic area right femur.

ilium and left scapula (Figures 3 and 4). An open biopsy of a lytic lesion of the left iliac crest under general anesthesia was obtained to confirm a single pathological process. All specimens yielded a whitish tumor tissue softer than the surrounding bone. The microscopic examination of the tissues revealed masses of polygonal cells, with some containing brownish pigment granules. The appearance was thought to be most consistent with amelanotic melanoma. The patient developed management problems resulting directly from widespread bony invasion and necrosis that included hypercalcemia up to 17 mg/dL treated with mitramycin, hyperuricemia up to 14 mg/dL treated with allopurinol, myelopthiasis anemia with a hematocrit of 20% treated with multiple blood transfusions, and spiked fevers with elevated lactate dehydrogenase and fibrin split products due to multiple foci of marrow necrosis, confirmed by biopsy. A course of DTIC (decarbazine, a chemotherapy drug given for types of cancer such as melanoma, Hodgkin's disease, and soft-tissue sarcomas) was instituted but failed to halt the rapid progression of the lytic lesions. He was discharged in rapidly deteriorating condition.

DIAGNOSIS

Amelanotic melanoma

DISCUSSION

Melanoma is a very vascular malignant tumor that originates in melanocytes, the cells that produce the pigment melanin that colors our skin, hair, and eyes. The majority of melanomas are black or brown. Some may be skin colored, pink, red, purple, blue, or white. Melanoma is the most serious form of skin cancer. Risk factors include sun exposure, number of moles on the skin, skin type, and family history (genetics). Ultraviolet (UV) rays and sunburns may induce melanomas. Tanning booths or tanning beds are most dangerous since they increase exposure to UV rays, increasing the risk of melanoma and other skin cancers. Fairer-skin people are at increased risk, as are those with basal cell and squamous cell carcinomas. If recognized and treated early, melanoma is nearly 100% curable. If not, the

cancer may advance and spread to other organs, and is thereby hard to treat and may be fatal. While it is not the most common skin cancer, it causes the most deaths. The American Cancer Society estimates that fatalities in men outnumber women.

The incidence of bony metastases from malignant melanoma has been variously reported as being between 2% and 10%. Such metastases are more likely to occur in flat bones, with the highest incidence in the axial skeleton, including the skull, spine, pelvis, and ribs. The lesion, initially medullary in location, is osteolytic of varying shape and degree of lysis as in our patient. Some are cyst like, with dense margins of reactive bone formation, while the margins of other lesions are ill defined, gradually fading into the normal bone. Many show a spotty, moth-eaten type (like multiple myeloma) with endosteal scalloping destruction with the overlying cortex being destroyed with little evidence of periosteal new-bone formation.[1-3]

Research from more than 102 patients suspected of metastatic melanoma to the lungs and magnetic resonance imaging (MRI) of various sizes of melanomas in the skin revealed 3 mm as the smallest within the skin. The T1-weighted MRI signal intensities of the melanoma lesions were identified as intermediate gray proton densities (reflecting high vascular supply) often recurring within the lymphatics at the same site of resection.[4,5]

TAKE-HOME MESSAGE

Melanomas are very malignant tumors and are considered as a very serious form of skin cancer. Risk factors include sun exposure, number of moles on the skin, skin type, and family history (genetics). Fair-skin people are at increased risk, as are those with basal cell and squamous cell carcinomas. Melanomas as small as 3 mm may be detected on MRI of landmark anatomy encompassing the area of lymphatic drainage. If the melanoma is not treated early, the cancer may be fatal. While it is not the most common of the skin cancers, it causes the most deaths. Health professionals should be aware that other organs may be primary for malignant melanoma such as the eye, gastrointestinal tract, and the genitourinary system.

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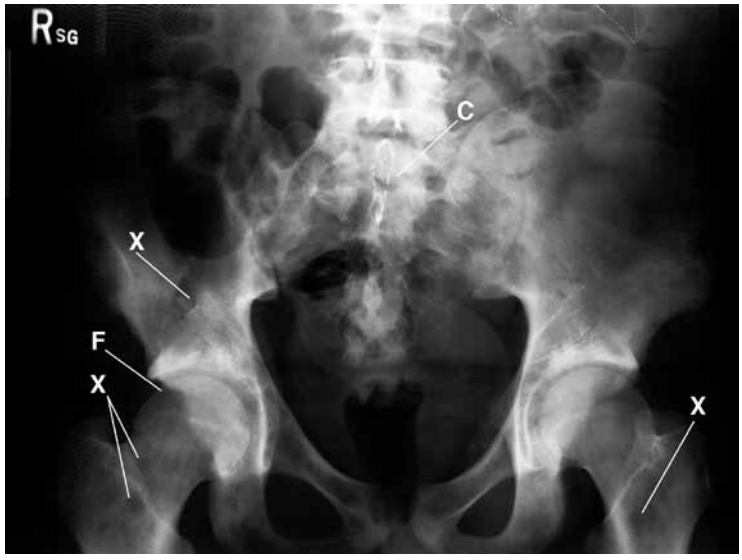
Figure 4. Left Ribs and Third Biopsy Site Within the Left Scapula (X); Lytic Destruction of the Left Posterior Eighth Rib Not Clearly Identified

Abbreviations: FR, first rib; X, third biopsy site of the left scapula.

Figure 5. Pelvis Post Biopsy With Residual Contrast Within The Spinal Canal (C) of the Sacrum and the Lytic Areas in the Right Pelvis (X) And Femurs (X)



Abbreviation: F, femur.