RADIOLOGY ROUNDS

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What are these punched-out lesions?

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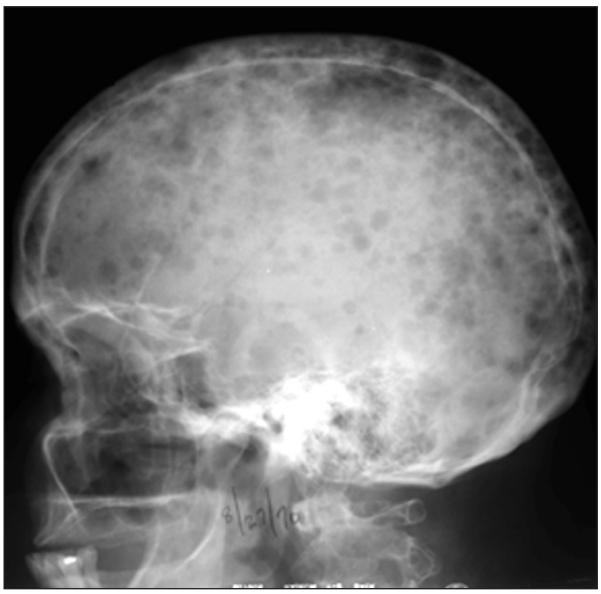

Figure 1 This lateral radiograph of the skull displays many punched-out, sharply defined lytic defects throughout the skull, as well as the cervical spine and mandible. The lesions do not seem to have a sclerotic border, and the foci spare the inner table of bone.

A 35-year-old woman comes in who had fallen while moving from her wheelchair to her bed. When she fell, she struck her head on a chair, lost her sense of direction, and injured her left hip. She is complaining of rib pain that worsened with movement. Her medical history includes recurrent bacterial infections. Physical examination finds kyphosis of the thoracic spine but no other abnormalities. Laboratory findings include a normocytic, normochromic anemia, Bence Jones proteinuria, and an M (for monoclonal) spike in the gamma globulin region on serum protein electrophoresis.

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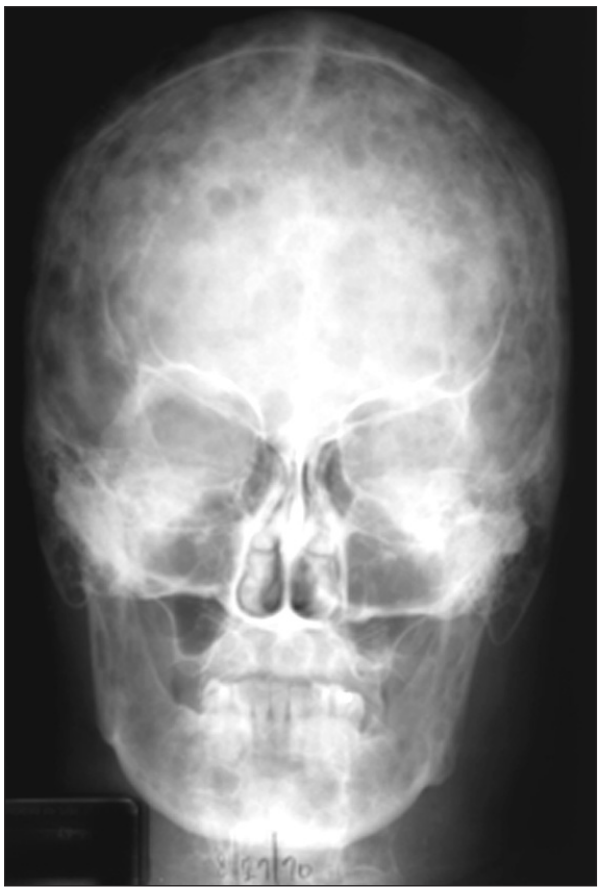

Figure 2 This anteroposterior skull radiograph cross-references Figure 1 to display the multiple lytic defects throughout the skull and mandible.

Radiographic findings

Lateral (Figure 1) and anteroposterior ([AP] Figure 2) radiographs of the skull display sharply defined multiple round, punched-out lucent foci, with sparing of the inner table of bone. The lesions do not seem to have a sclerotic border. The mandible and cervical spine are also involved. Lumbar spine films (not included here) display extensive demineralization and severe com-

pression fractures at the T10-T11 and L4 vertebrae. A posteroanterior chest radiograph (not included) confirm rib fractures, lytic bone defects, a questionable left lower lung infiltrate, and kyphosis of the thoracic spine. The AP pelvis radiograph (Figure 3) displays multiple, variable, sharply defined lytic areas and contrast (Ethiodol) enhancement from a lymphangiogram in the right inguinal lymph nodes.

Diagnosis

The differential diagnosis includes round cell tumors of the bone, especially, multiple myeloma and lymphoma. The skull findings are classic for myeloma, and the diagnosis is multiple myeloma. Postmortem evaluation disclosed malignant reticuloendotheliosis, mild myocardial and pulmonic calcinosis, nephrocalcinosis, and pericardial effusion.

Discussion

Multiple myeloma is a malignant round cell tumor of bone that contains a neoplastic proliferation of plasma cells. An estimated 15,980 new cases will be diagnosed in 2005 in the United States, and some 11,300 persons will die of the disease.[1] Myeloma is considered by some to be the most common primary lesion of bone. Incidence is rare in those younger than 40 and increases with age, having a median age at presentation in the mid-60s. Bony signs and symptoms vary from localized pain and tenderness to fractures, particularly involving bones of the spinal column although some patients are asymptomatic and the myeloma is found incidentally. Pain, the most common symptom, is reported by 70% of patients.[2] Recurrent bacterial infections are a presenting feature in about one fourth of patients, and another three fourths will have a serious infection during the course of the disease.[1] Other conditions associated with multiple myeloma include anemia, hypercalcemia (which can lead to renal disease and even renal failure), and neurologic symptoms such as weakness, confusion, and hyperviscosity.[2]

On plain radiographs, lesions may appear as solitary, generalized, or multiple. Extraskeletal myeloma (nasopharyngeal or oral cavity mass, that is, plasmacytoma) is rare. Since the lesions are lytic and seldom associated with osteoclastic new bone formation, plain radiography is more useful than radioisotopic bone scans in making the diagnosis. Laboratory findings may include Bence Jones protein in the urine, anemia, abnormal renal function results, and a monoclonal spike in the globulin fraction on serum electrophoresis.

Figure 3 This anteroposterior pelvic radiograph displays multiple lytic areas and contrast material from a lymphangiogram in the right inguinal lymph nodes (arrows). Observe the endosteal scalloping of lucent areas within the femurs (bar arrow).

Treatment of multiple myeloma has improved significantly during the last few decades and generally includes systemic chemotherapy to slow myeloma progression and supportive care against its complications such as bisphosphonates to reduce skeletal problems.[2]

Take-home messages from this case

When a patient's presenting complaint is chest pain, consider a plain radiograph directed to the area of pain—and do not forget to look at the bones. In plain radiographs with multiple, lytic, bony lesions, think of round cell tumors of bone, particularly multiple myeloma and lymphoma. The lytic, punched-out lesions are typical of myeloma. ■

REFERENCES

1. American Cancer Society. Cancer Facts & Figures 2005. Atlanta, Ga: American Cancer Society; 2005:4.
2. Longo DL, Anderson KC. Plasma cell disorders. In: Kasper DL, Braunwald E, Fauci AS, et al, eds. Harrison's Principles of Internal Medicine. 16th ed. New York, NY: McGraw-Hill; 2005:656-662.