RADIOLOGY ROUNDS

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A man with worsening sacroiliac pain 3 months after a fall

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A 72-year-old man came to the outpatient clinic with complaints of severe left sacroiliac pain. He had fallen about 3 months earlier, and the pain he incurred then had worsened over the past 2 weeks. He had a 10-year history of myasthenia gravis for which he had been treated with pyridostigmine bromide (Mestinon) that provided symptomatic relief.

Findings of the physical examination were generally within normal limits. He reported pain over his left first rib and left sacroiliac region. He had no abdominal masses, and digital rectal examination showed that his prostate was of normal size.

In the first stage of the workup, radiographs were done of the chest, pelvis, and left first rib. Because of lytic defects in the sacrum and left posterior first rib, a bone scan and percutaneous biopsies under fluoroscopic control were ordered. Scheduled laboratory studies included a urinalysis, acid phosphatase and prostate-specific antigen (PSA) levels, and, if indicated, an intravenous pyelogram.

The radiographic findings

An anteroposterior (AP) radiograph of the pelvis displayed a large lytic defect in the left sacrum (Figure 1). A coned-down posteroanterior (PA) chest radiograph of the left shoulder revealed near complete lytic destruction of the proximal left first rib (Figure 2). A bone scan (Figure 3) demonstrated increased isotope uptake in the region of left posterior first rib and minimal but increased activity in the area of the left sacrum and at approximately the level of T12. Such scans are often used to indicate the safest site for percutaneous biopsy.[1] A prone pelvic radiograph, with the Craig biopsy needle in place, displayed a compression fracture at L4 (Figure 4). The left pedicle of L4 is destroyed, with an associated loss of height of the vertebral body.

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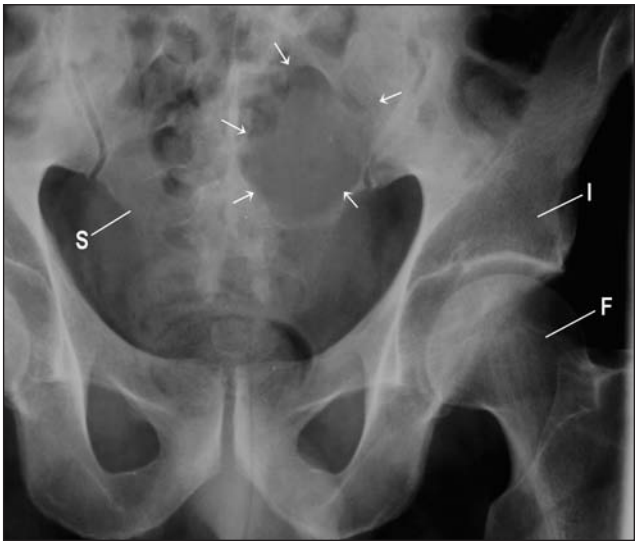

Figure 1 This anterior posterior radiograph of the pelvis displays lytic destruction (arrows) of the left sacrum (S). F = femur; I = ilium.

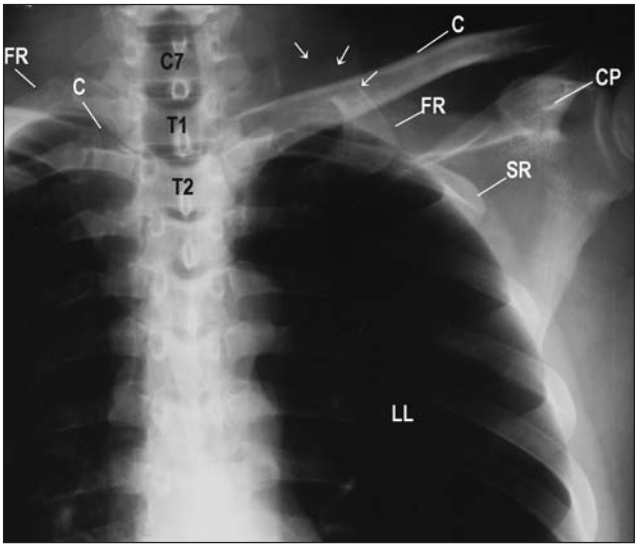

Figure 2 This coned-down anteroposterior chest radiograph displays lytic destruction (arrows) of the left first rib (FR). C = clavicle; CP = coracoid process; C7 = 7th cervical vertebra; LL = left lung; SR = second rib; T1 and T2 = 1st and 2nd thoracic vertebrae.

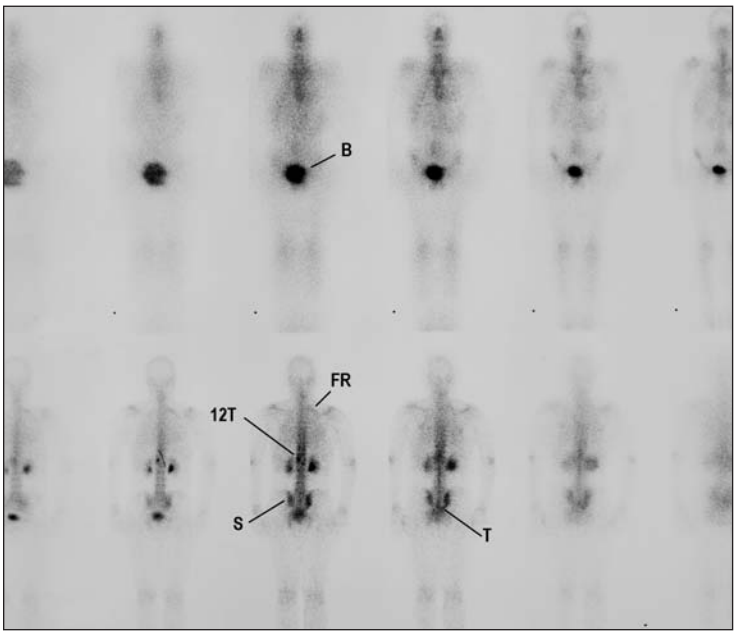

Figure 3 In this technetium 99m methylene diphosphonate (99m Tc MDP) whole-body bone scan, the upper level displays anterior images; the lower level, posterior images. Observe landmark anatomy of the bladder (B) in the upper level and increased uptake over the region of the left first rib (FR) and 12th thoracic vertebra (T12), and tumor destruction (T) of the left sacrum (S) in the lower.

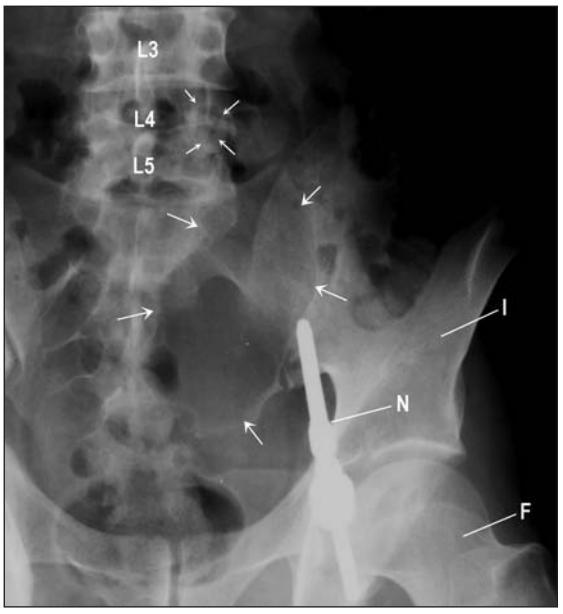

Figure 4 This prone posteroanterior radiograph documents the fixed position of a Craig biopsy needle (N) over the lateral margin of the lytic lesion (large arrows) in the left sacrum, and lytic destruction of the left pedicle (small arrows) of the compressed 4th lumbar vertebra (L4). F = femur; I = ilium; L3 and L5 = 3rd and 5th lumbar vertebrae.

The differential diagnosis included metastatic carcinoma to bone, with prostate carcinoma as the most probable primary site, or metastasis from primary renal cell carcinoma. The histologic picture was most consistent with metastatic adenocarcinoma from primary prostatic carcinoma, which was the opinion of the consulting pathologists and is rapidly fatal. PSA levels were significantly elevated.

Discussion

Most bony metastases found during routine examinations originate in the breast or prostate. Metastases in bone from the kidney are also common, but these primary tumors are relatively rare. The lungs are the source of the third most common primary tumors metastasizing to bone. Other cancers likely to metastasize to bone are thyroid and kidney. Metastatic tumors are more common than primary tumors in bone.

The appearance of metastases is variable. They may be osteoblastic, osteolytic, or a combination of the two. The great majority of metastases are osteolytic; those from the prostate and bladder are usually osteoblastic.

A summary of common metastatic characteristics[2]:

• *Breast* Nearly all are osteolytic, with lesions almost invariably multiple and several centimeters in diameter. About 10% of breast carcinoma metastases are osteoblastic, and 10% are mixed.

• *Prostate* Unlike breast metastases, nearly all from the prostate are osteoblastic.

• *Lung* Second to prostate as the source of metastases in men, these lesions are almost always osteolytic.

• *Kidney* Metastases of renal cell carcinoma are typically osteolytic and may cause marked expansion of the affected area. They are usually responsible for solitary (and no more than six) bone metastases.

Take-home message

This patient's disease was not suspected, and he did not have a prostatic disease workup, which is usually done soon after the diagnosis of prostate cancer to determine the risk of metastases or to stage metastatic prostate disease. His pain required a baseline plain film that detected lytic lesions. The technitium bone scan was selected because it is the most reliable and least expensive choice to detect lesions not displayed on plain films. ■

REFERENCES

1. Collins JD, Bassetet L, Main GD, et al. Percutaneous biopsy following positive bone scans. Radiology 1979;132:439-442.
2. Meschan I. Radiolucent bone diseases of multiple extremeties or regions. In: Synopsis of Analysis of Roentgen Signs in General Radiology. Phildelphia, Pa: WB Saunders; 1976:79.