



X-RAY / IMAGING / MRI

Osteoporosis Isn't Always the Case

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What is your diagnosis? (Figure 1) The patient is a 58-year-old female with back pain. I am sure all of you see the compression fracture at L2; however, there are some findings that suggest this is not a compression fracture due to osteoporosis: the appearance of a lucent lesion in the vertebral body of L2 and possibly also in the L4 vertebral body. Yet I am certain everyone would suspect this would be osteoporosis because the patient is female.

This is actually multiple myeloma. Are you able to pick up on the findings that suggest this patient has something more than osteopenia? Of course, we don't treat patients for multiple myeloma, but we do treat patients with back pain. Back pain was this patient's main complaint, which led them to the chiropractor's office for care.

[Multiple myeloma](#) is a debilitating malignancy that is part of a spectrum of diseases ranging from monoclonal gammopathy of unknown significance (MGUS) to plasma cell leukemia. Because the plasma cells are malignant, they may cause unusual manifestations. Can you recognize this condition? Test your knowledge with this short quiz.

What Is the Most Common Presenting Symptom for Patients With Multiple Myeloma?



FIG. 1 Test your knowledge - what is your diagnosis based on this radiograph?

Bone pain is the most common presenting symptom. Approximately 70 percent of patients have bone pain at presentation. The lumbar spine is one of the most common sites of pain. Other symptoms patients with multiple myeloma typically present with include general malaise, infection, fever, paresthesia, sluggish mentation and sensory loss. Patient typically experience these symptoms when their serum viscosity is greater than four times that of normal serum.

What Tests Are Part of the Standard Diagnostic Workup in Patients Suspected to Have MM?

- Serum and urine assessment for monoclonal protein
- Serum-free light chain assay
- Bone marrow aspiration and/or biopsy
- Serum beta(2)-microglobulin, albumin, and lactate dehydrogenase measurement
- Standard metaphase cytogenetics
- Fluorescent *in situ* hybridization (FISH)
- Skeletal survey
- MRI

Multiple myeloma is the most common primary malignant neoplasm of the skeletal system. It is seen primarily in patients over 40 years of age, with a predilection for males 2 to 1 over females. It accounts for 1 percent of all malignancies and 10 percent of all hematological disease. Together with osteosarcoma, multiple myeloma accounts for 50 percent of all primary bone malignancies.

The disease is a malignancy of plasma cells. Radiologically, it presents most often with multiple destructive lytic lesions of the skeleton, as well as severe demineralization. The etiology of the disease is the monoclonal proliferation of plasma B cells, with resultant marrow infiltration and increase of a single immunoglobulin and its fragments in the serum and urine. Electrophoretic analysis shows increased levels of immunoglobulins in the blood, as well as light chains (Bence-Jones protein) in the urine.

What Is the Treatment for MM?

Currently, multiple myeloma remains incurable, although the introduction of new drugs such as thalidomide, lenalidomide and bortezomib (proteasome inhibitor) has provided significant treatment gains. These are typically used in combination with older agents such as cyclophosphamide, melphalan, prednisolone and doxorubicin. Treatment response is usually evaluated by measuring serum markers and bone marrow sampling. Stem-cell harvest and autologous stem cell transplant post chemotherapeutic / radiotherapy bone marrow ablation is also used.



FIG. 2 Classic multiple punched-out lesions in the skull from multiple myeloma.

Treatment protocols are complicated and beyond my scope of practice, but if you are interested, check out [this site](#), which gives the accepted guideline for the treatment of many cancers.

Radiographic Features and Clinical Presentation

What I think is important for us to know are the radiographic features of multiple myeloma and the clinical presentation. The most common clinical symptom, as I noted earlier, is bone pain, followed by general malaise. Radiographic features that are classic for this disease are numerous well-circumscribed, [lytic bone lesions](#) in the axial skeleton, most commonly in the vertebrae. Less commonly, the radiographic appearance is generalized osteopenia, often associated with vertebral compression fractures. However, it should be noted that initially, radiographs may be normal despite the presence of symptoms.

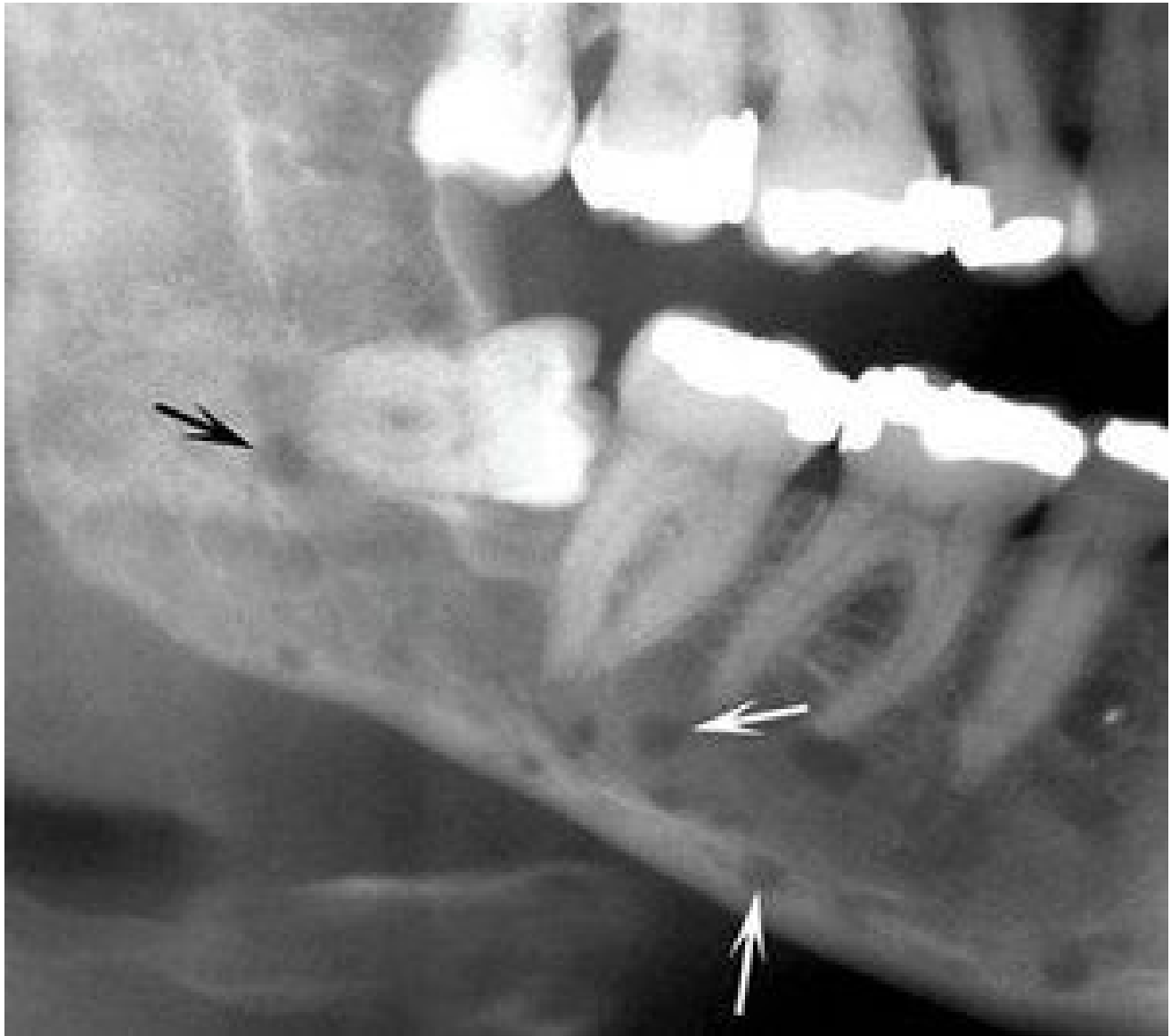


FIG. 3 Multiple punched-out lesions in the mandible from MM.

Clinical Statistics:

- Average age is 60-70 years.
- Condition is much more common in men than women.
- Most patients have an elevated serum protein, with 80-90 percent in the globulin fraction, especially IgG.
- Bence-Jones protein present in 40-60 percent of patients (light chains).

Radiographic findings

- Osteoporosis is the most common skeletal abnormality in this disease.
- Lesions are usually multiple and found in vertebrae, ribs, skull, pelvis and femur. (Figure 2)
- More than 50 percent of solitary lesions are found in vertebrae.
- The mandible is involved in one-third of patients with diffuse involvement. (Figure 3)
- Widespread lucencies found in bone, discrete lesions; uniform in size.
- In spine, multiple myeloma destroys the body and spares the pedicle.

I am not suggesting we chiropractors need to do the workup on a patient we suspect might have multiple myeloma. However, we do need to be aware that patients with osteopenia and bone pain might seek care initially with a chiropractic practitioner. We don't want to misdiagnose this condition as osteoporosis.

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