

# RECURRENCE OF PROSTATE ADENOCARCINOMA PRESENTING WITH MULTIPLE MYELOMA SIMULATING SKELETAL METASTASES OF PROSTATE ADENOCARCINOMA

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## ABSTRACT

We present the case of a 77-year-old man with recurrence of prostate adenocarcinoma and widespread skeletal lesions. The skeletal lesions were found to be caused by multiple myeloma rather than metastatic spread of prostate adenocarcinoma. Various aspects of the radiographic imaging, evaluation of elevated prostate-specific antigen, and treatment of prostate adenocarcinoma are discussed. *UROLOGY* **60**: 1111xiv–1111xvi, 2002. © 2002, Elsevier Science Inc.

The most common cancers that metastasize to bone include prostate, breast, kidney, thyroid, and lung cancers. In a patient with previously diagnosed prostate cancer, the development of skeletal lesions seen on imaging studies accompanied by elevations of prostate-specific antigen (PSA) usually suggests the recurrence of prostate cancer. We present the case of a patient who had a recurrence of prostate adenocarcinoma simultaneously with skeletal lesions caused by multiple myeloma rather than metastatic spread of prostate adenocarcinoma.

## CASE REPORT

A 77-year-old man with hypertension presented for a follow-up evaluation. He had been diagnosed with prostate cancer and had undergone radical prostatectomy 8 years previously. The pathologic examination had shown moderately differentiated adenocarcinoma of the prostate (Gleason grade 3 + 4 = 7) with level 1 capsular invasion and perineural involvement. The seminal vesicles and pelvic lymph nodes were normal. His PSA level had gradually increased during the past 3 years, with the most recent measurement at 12.0 ng/mL. The patient remained asymptomatic without any

sphincter dysfunction, weakness, or bone pain. Digital rectal examination revealed a smooth prostatic bed with no palpable nodules.

A ProstaScint study was positive, showing an area of focally increased uptake in the prostatic bed, suggesting a recurrence of prostate carcinoma. A nuclear bone scan revealed moderate to severe degenerative changes in the vertebrae, pelvis, and femurs, but without identifiable metastases. Computed tomography of the abdomen and pelvis also revealed numerous areas of lucency and sclerosis in the axial skeleton. Abnormal pelvic lymphadenopathy was not found. To characterize the suspicious lesions further, a magnetic resonance imaging (MRI) bone survey was performed that showed a lobular pattern of diffuse bone marrow replacement throughout the spine, pelvis, and proximal femurs (Fig. 1). Given the patient's PSA levels and medical history, the skeletal lesions seen on the imaging studies were considered to most likely represent skeletal involvement by metastatic disease from the prostate. The plan was to treat the patient with total androgen blockade with leuprolide and bicalutamide, followed by another MRI bone survey to assess the response and extent of disease.

After treatment with hormonal therapy for 2 months, the patient continued to be asymptomatic, with his PSA level decreasing to 0.1 ng/mL. However, the follow-up MRI bone survey did not show any significant change from the previous study and continued to be consistent with widely metastatic disease. To explore other etiologies, the patient underwent bone marrow aspirate, clot, and biopsy

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*Submitted: June 10, 2002, accepted (with revisions): August 9, 2002*



FIGURE 1. MRI bone survey demonstrating diffuse bone marrow replacement throughout the lumbar spine.

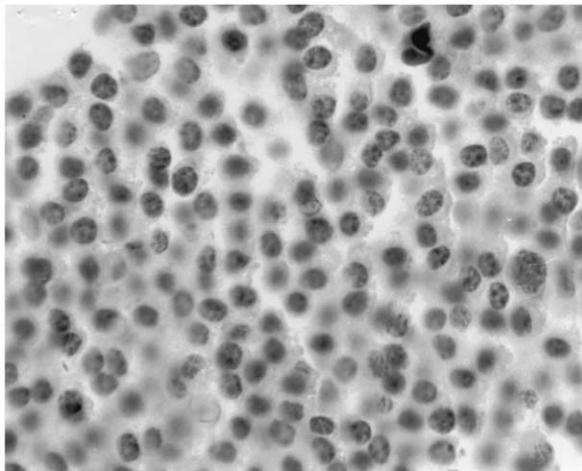


FIGURE 2. Bone marrow biopsy showing multiple myeloma with plasma cells replacing the normal marrow cells.

that revealed multiple myeloma (Fig. 2), confirmed by immunohistochemical stains positive for lambda-light chain and negative for PSA. Urine and serum protein electrophoresis and Bence-Jones protein in the urine confirmed this diagnosis, and the patient was referred to a hematology oncologist for further treatment of his multiple myeloma. The patient subsequently completed 4 months of hormonal therapy and underwent conformal intensity-modulated radiotherapy, delivering 64 Gy to the prostatic bed for local tumor re-

currence control. At the latest follow-up, 20 months after completion of the combined treatment, the patient's PSA level had decreased to 0.06 ng/mL. His digital rectal examination was unremarkable, and he remained asymptomatic.

## COMMENT

Cancers that commonly metastasize to bone include prostate, breast, kidney, thyroid, and lung cancers. Prostate cancer metastases are characterized by diffuse involvement of the axial and proximal appendicular skeleton, such as were seen in this patient's imaging studies, and they are usually accompanied by elevated PSA levels that suggest tumor recurrence. However, several aspects of this patient's presentation were not typical of prostate cancer metastases and, in retrospect, suggested the possibility of another disease process.

Approximately 80% of prostate cancer metastases are osteoblastic lesions. The degenerative changes seen on this patient's bone and computed tomography scans indicated an osteolytic process. Lytic lesions are very infrequent, with 15% mixed osteoblastic and osteolytic and only 5% solely osteolytic.<sup>1</sup> When the lesions do have a lytic component, the primary prostate tumors are usually squamous cell carcinomas or sarcomas.<sup>2</sup> It should also be noted that although MRI bone survey is considered very sensitive in examining bone marrow invasion, radionuclide bone scintigraphy is the preferred imaging study because of its ability to assess the entire skeleton.<sup>1</sup> The disadvantages of the MRI bone survey are its additional cost and that its examination of the ribs is not ideal.

A widely metastatic prostate cancer with imaging findings similar to this patient's would generally give rise to a much higher PSA than 12 ng/mL. A relatively lower PSA level in the presence of widespread metastases, such as in this case, may suggest the possibility of a very high-grade poorly differentiated or de-differentiated prostate adenocarcinoma or other pathologic entities such as small cell carcinoma, neuroendocrine tumor, or multiple myeloma.

Some studies have described the implications of PSA doubling times in postprostatectomy patients with subsequent PSA elevations. It has been reported that patients who ultimately progress to distant failures typically have a PSA doubling time of less than 12 months, and those of patients with local failure can range anywhere from 1 to 99 months.<sup>3</sup> The patient in this case had a PSA doubling time of 7.1 months, which does not convincingly predict the likelihood of him having local or distant failure. If his PSA doubling time had been greater than 12 months, the likelihood that the skeletal lesions were due to distant metastatic dis-

ease from the prostate would have been very low; thus, prompting the clinicians to explore other etiologies such as those listed above.

Finally, it is important to note that his pre-hormonal/radiotherapy PSA level was relatively high at 12 ng/mL, and it was recognized that the outcome of patients with postprostatectomy PSA levels greater than 2 ng/mL treated with radiotherapy alone was not satisfactory. This may be due to the presence of micrometastases leading to distant failure despite local radiotherapy. Our current approach for these patients with a preradiotherapy PSA level greater than 2 ng/mL has been combined radiotherapy and hormonal therapy. However, this approach is still controversial according to a recent American Society for Therapeutic Radiation and Oncology consensus meeting.

### CONCLUSIONS

This case illustrates the importance of a thorough evaluation in those patients with elevated

PSA levels after treatment. This case should raise the suspicion for another neoplastic process, because the PSA level and doubling times did not seem to correspond with such widespread osteolytic involvement. The workup for these patients in whom the etiology is unclear should always include radionuclide bone scintigraphy, complementary MRI bone survey, and, possibly, definitive bone marrow biopsy. In addition, the finding of two unrelated malignancies will have a significant impact on treatment of the patient.

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