

# Back Pain Caused by a Solitary Plasmacytoma of Bone

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This article presents initial diagnostic workup and criteria for diagnosing solitary plasmacytoma of bone (SPB) versus multiple myeloma. The authors discuss the incorporation of current imaging technologies into the diagnosis and staging of SPB and multiple myeloma. In addition, the article addresses treatment modalities and discusses the importance of oncology nurses' awareness of this rare condition.

## Case Study

Mr. J is a 44-year-old African American patient with a chief complaint of "low back pain." He presented as a follow-up to his initial appointment four weeks prior for back pain. He stated that his back pain had decreased from a level of 5 to 3 on most days, but he still had pain, particularly in the evening.

Mr. J had had three sinus infections with antibiotic treatment in the past year. He has no known chronic medical conditions. At 74 inches tall and weighing 180 lbs., he follows a vegan diet and exercises five to seven days per week. Mr. J's focused physical examination found him to be alert with no acute distress. His spinal examination showed paraspinal tenderness in the lumbar (or L-S) region and forward flexion and extension without limitation, with no lesions noted. Mr. J's deep tendon reflexes scored normal at +2, symmetric; his muscle strength also was normal at +5/5.

The healthcare team planned to take an x-ray of Mr. J's lumbar spine and continue nonsteroidal medication. Follow-up would occur in two to three weeks if no improvement was noted or sooner if symptoms increased or x-ray abnormalities were found. X-ray revealed a single focal osteolytic lesion in the lumbar vertebrae. With a differential diagnosis of solitary plasmacytoma of bone (SPB), the team planned to do a workup to rule out multiple myeloma.

## Diagnostic Evaluation

The initial diagnostic workup for SPB requires a number of baseline blood studies, including a complete blood count with differential and platelet count, blood urea nitrogen, serum creatinine and serum electrolytes, serum calcium, albumin, lactate dehydrogenase, beta-2 immunoglobulin, quantitative immunoglobulin levels, serum protein electrophoresis, and serum immunofixation electrophoresis. Baseline urine analyses include 24-hour urine, urine protein electrophoresis, and urine immunofixation electrophoresis (National Comprehensive Cancer Network [NCCN], 2009). Results of the workup can be used to rule out multiple myeloma versus a localized plasmacytoma. Necessary criteria for a diagnosis of plasmacytoma are summarized in Figure 1.

Mild hemolytic anemia is seen with the systemic disorder multiple myeloma, although hemoglobin levels remain in the normal range in SPB. Bone damage can result in calcium mobilization from the affected bone into the serum, leading to hypercalcemia. The serum calcium alteration is seen more frequently in multiple myeloma, with serum calcium

levels generally remaining within the normal range in SPB. Elevated creatinine and blood urea nitrogen are indicative of decreased kidney function and often are seen in multiple myeloma; the renal involvement is not present in SPB (DeFilippo et al., 2008).

In addition to testing for serum protein level, a 24-hour urine specimen is collected and tested for total protein. High levels of monoclonal protein in serum and urine are indicative of multiple myeloma. SPB typically is characterized by absent or low serum or urinary levels of monoclonal protein. Although elevated levels of monoclonal protein are seen in 24%-72% of patients with SPB, the levels are much lower than those seen in patients with multiple myeloma (DeFilippo et al., 2008).

Clonal plasma cells produce monoclonal immunoglobulin, which may appear as a monoclonal spike on serum electrophoresis. In addition, an assay for serum immunoglobulin free light chains allows quantitation of both kappa and lambda light chains that are not bound to intact immunoglobulin molecules, allowing for determination of clonality based on the kappa to lambda ratio. An abnormal free light chain ratio is prognostic

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