



Minimally Invasive Approach of Lumbar Plasmacytoma: Case Report

André Guimarães^{*}, Rita Sousa, Sara Neves, Pedro Teixeira Gomes, Luís Castelo

Abstract

Solitary Bone Plasmacytoma is a subtype of Solitary Plasmacytoma characterized by a mass of monoclonal plasma cells with involvement of bony structures. This pathology presents a high risk of progression to Multiple Myeloma with systemic involvement. In vertebral involvement it can lead to lytic lesions with progression to vertebral collapse and instability. The clinical case is a female patient with no medical history, with a clinic of low back pain with evolution for more than 1 month, radiography showed wedge of L4 and computed tomography a lytic lesion of that level, was hospitalized for pain control and study. The Magnetic Resonance came to discard the compression of noble parts. She was admitted for surgery due to vertebral instability and minimally invasive L2-L3-L5 posterolateral fixation was performed with transpedicular bars and screws, tissue biopsy and decompression with L4 partial facetectomy laminectomy. Surgery was uneventful and the patient was discharged 3 days after a complementary study of the disease. After 1 month, the patient showed clear improvement in pain and after half a year, the fixation was stable without instability or deformities. The patient was followed up by Orthopedics and Hematology. Plasmacytoma is an uncommon neoplasm and the main symptoms are low back pain, as in the case described. Radiotherapy is the treatment of choice, however surgery has been growing as an adjuvant and clinical improvement. This case demonstrates a unique treatment, not previously described with a percutaneous fixation with good results.

Keywords: Solitary Plasmacytoma; Solitary Bone Plasmacytoma; Vertebra; Minimally Invasive Fixation; Spine Surgery

Introduction

Solitary Plasmacytoma (PS) is a single mass of neoplastic clones of plasma cells, representing about 5% of all cellular dyscrasias[1-4] with an incidence of 0.15/100,000 people [2]. It can be subdivided into Solitary Bone Plasmacytoma (PSO) or Solitary Intramedullary Plasmacytoma (PSE), depending on the location it involves, PSO involves only the bone structure and PSE the soft tissues or other organs such as Head, neck and respiratory and gastrointestinal tract [1,2]. 70% of all PS are PSO and comprise all bones with bone marrow respectively: vertebra, femur, pelvis and ribs [2]. Radiotherapy and alternative surgery are treatment modalities, but the results are variable, with a high risk of progression to Multiple Myeloma (MM) 50% PSO and 30% in 10 years [2,4]. PSO can rarely lead to pathological vertebral fractures and consequently to spinal cord instability and compression [5].

Case Report

The clinical case is of a 66-year-old female patient, with no relevant personal and family history, who went to the emergency department for

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non-radiating low back pain with evolution for 1 month. On physical examination, the patient was in good general condition, hemodynamically stable and afebrile, with normal gait but with pain on trunk mobilization, without sciatica, negative provocation tests and normal neurological examination. Lumbar spine radiography (RX) showed L4 wedge (Figures 1,2), but no other changes. Computed Tomography (CT) was performed on the lumbar spine and showed a vertebral canal with normal dimensions and an osteolytic expansive lesion of the L4 body with erosion of the cortical walls, with somatic flattening and bulging of its contours extending to the pedicles of greater area. Left (Figures 3,4). There were no other associated bone lesions,

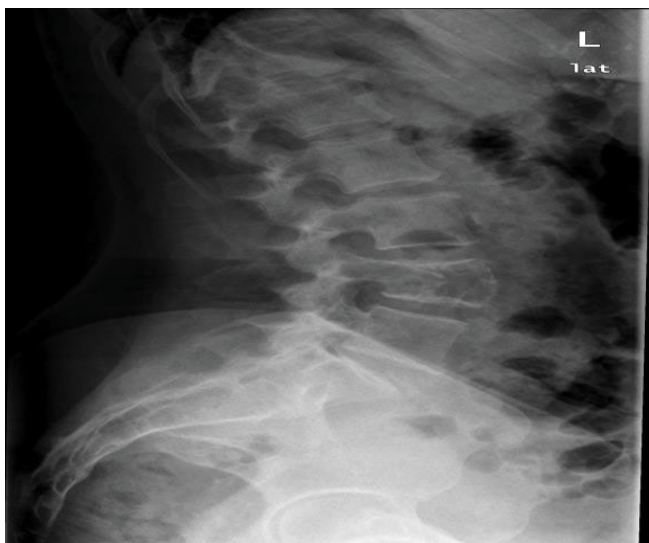


Figure 1: RX Sagittal.



Figure 2: RX Coronal.



Figure 3: CT Sagittal.



Figure 4: CT Horizontal.

there was also an anterior thickening at this level that could compromise the thecal sac and its roots. Therefore, the patient was hospitalized for pain control and study of the lytic lesion. During hospitalization, an MRI was performed, which showed no apparent endocanal involvement of the lesion and adjacent tissues. Due to her L4 instability, she was admitted for orthopedic surgical treatment.

Minimally invasive posterolateral fixation (Orthofix MBA) L2-L3-L5 with transpedicular bars and screws was performed percutaneously, tissue biopsy and decompression with partial facetectomy laminectomy of L4 through a small midline incision (Figures 5,6). The surgery was uneventful, the next day the patient presented with clear improvement in pain and no deficits again. During hospitalization, the

patient underwent the analytical study with no evidence of anemia with normal renal function and no other changes and underwent a bone marrow biopsy. After 3 days, the patient was discharged with controlled pain. After 2 weeks, the patient had some discomfort in the area of the surgical scar, but no other changes. Tissue biopsy revealed a cluster of well-differentiated plasma cells with CD138 and CD56 staining and the myelogram showing 6.8% of plasma cells, also in this period a study of Positron Emission Tomography with Fluoride-18-Fluodesoxyglucose (PET - FDG) was carried out. did not mark uptake at other sites of the lesion.

Therefore, the diagnosis of PSO was obtained and 40GY Radiotherapy was started for 4 weeks. After 1 month, the patient had a well-healed surgical scar with improvement in pain, on CT he showed a stable fixation and without deformities again. He maintained follow-up in Hematology every 4 months and Orthopedics every 6 months in the first year (Figure 7,8), and then annually from the 2nd year onwards with interspersed surveillance of X-ray and CAT scans and without a news deficits or failure of percutaneous fixation.

Discussion

The diagnosis of PSO or PSE requires tissue biopsy with monoclonal infiltration of plasma cells. PSO requires the presence of a lytic lesion [1,2]. For the diagnosis of PS there must be no organ damage including hypercalcemia, renal dysfunction and anemia [1,2], which the patient did not have. According to the immunohistochemical characteristics of the plasma cells, the tissue biopsy should reveal characteristics of a homogeneous monoclonal infiltration with the expression of CD138 and/or CD38 [2], being consistent with the diagnosis

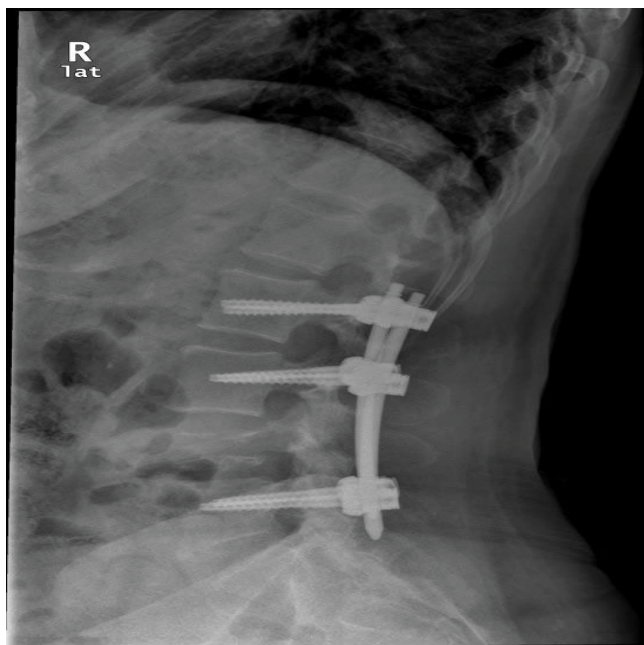


Figure 5: Post-surgery Sagittal

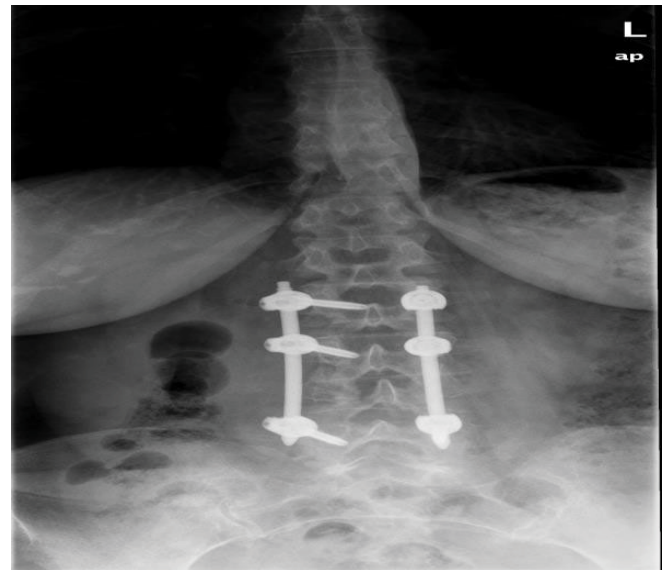


Figure 6: Post-surgery Coronal RX.



Figure 7: Sagittal MRI after 6 months of surgery.

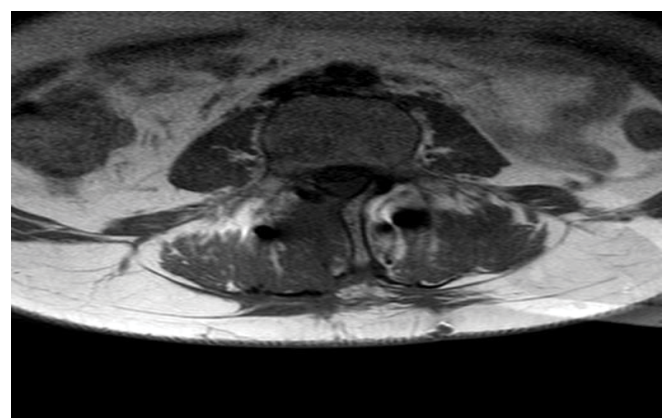


Figure 8 : Horizontal MRI after 6 months of surgery

of the patient with the expression of CD138. To exclude MM, it is necessary that there is no damage to other organs, nor must there be bone marrow infiltration or the presence of up to <10% of monoclonal plasma cells. If there is bone marrow infiltration, there is an increased risk of progression to MM with a mean progression without bone marrow infiltration of 42 months and with monoclonal infiltration of 15 months [1,2]. While monoclonal proteins, Bence Jones, can be detected in the blood up to 72%, however, their persistence for more than one year leads to a risk of progression of 71% to MM, constituting a risk factor and a poor prognosis factor [1,2]. Low back pain is one of the main symptoms of medical consultation and is associated with greater disability in the population. Low back pain can be the first manifestation of malignant pathology attributed to up to 1% [2,5]. Consistent with our case, PS is usually indolent or the first clinical manifestations are low back pain [6], although about 25% develop neurological dysfunction in the form of foraminal or spinal cord compression [4]. These lesions present with a mean age of 55 years and are more frequent in men [1] with an overall incidence of 0.191 for men and 0.090 per 100,000 people for women [2]. Conventionally, radiography and CT have been recommended as the first evaluation imaging tests. In PSO, the trabecular bone is preferably replaced and the cortical bone is preserved or partially sclerosed. However, about two thirds show mixed pattern features predominantly with lithic pattern [2,6]. Although MRI has a lower sensitivity to detect lytic lesions compared to CAT, it is the best exam to detect bone marrow injury and spinal cord compression [1,2], and in this clinical case, confirmation of the absence of spinal cord involvement was crucial. It is currently the gold standard for imaging. PSO typically involves the vertebrae, half of which cause myelopathy to patients [7]. The vertebral affection is preferential in the body of the vertebra, being more frequent in the thoracic vertebrae [1,2,6,7]. However, vertebral involvement has been reported to have a worse prognosis compared to other sites of skeletal involvement [7]. The pathological fracture similar to this case results from the collapse of the vertebral body and, consequently, the biomechanical instability of the spine and neurological compromise.

Radiotherapy is the treatment of choice [1,2], whereas surgery is not the first line in patients, because in the long term, studies reveal that it does not change the progression of the disease after 10 years, but there is always an indication in the presence of intractable pain, instability and progression of neurological impairment [1,2,8]. Many authors advocate surgery with posterior radiotherapy to minimize local recurrence [5]. Xie L [9] and colleagues in a study of 1275 patients who were treated with radiotherapy alone and radiotherapy plus surgery concluded that progression to MM was much slower in people aged <45 years treated with surgery and radiotherapy. The surgical approach to the patient

followed the principles of decompression with laminectomy and stabilization with a more recent percutaneous technique. There are several cases described with radical spondylectomy in bloc surgery or corpectomy with a dual approach [4-6,8], but in cases with involvement of the entire vertebra and with involvement of the extramedullary, dura mater and with severe neurological impairment. Our case did not present spinal cord involvement or involvement of the entire vertebra, so we opted for a minimally invasive fixation, avoiding further sequelae to the patient.

Conclusion

This case demonstrates a total benefit in the surgical treatment of PSO with decompression and instrumentation for stabilization, supporting the literature of the great clinical benefit in improving neurological function. Evidencing something that is not demonstrated in the current literature, the possibility of minimally invasive treatment.

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