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Case Study

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THE ROLE OF RADIOTHERAPY IN SPINAL CORD COMPRESSION CAUSED BY SOLITARY BONE PLASMACYTOMA: A CASE REPORT

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ABSTRACT

Introduction: Solitary bone plasmacytoma (SBP) is a hematopoietic malignancy occurring in bone tissue, which often causes bone destruction at the site of the lesion. When the lesion occurs in the spine and causes spinal stenosis and compression of the spinal cord, surgery is performed as an adjuvant treatment before radiotherapy. **Case Presentation:** A 56-year-old patient suffered of back pain followed by muscular weakness of the lower limbs. manipulation by an osteopath with the appearance 48 hours later of a difficulty to walk, motor deficit with motor testing at 0/5 in the lower limbs for 1 week with ROT +/+ in patellar present not sharp, not polykinetic with Babinski indifferent to both feet,CT and MRI examination of the spinal after emergency admission revealed T8 vertebral pathological fracture with associated spinal stenosis and spinal cord compression. PET-CT indicated a hypermetabolic soft tissue mass in the T8 vertebral body. Finally, a needle biopsy was performed at the lesion site and a diagnosis of SBP was made. Radiotherapy was immediately followed and the spinal cord compression was relieved a month later. **Conclusion :** For patients with SPB resulting in pathological fracture of the thoracic vertebra with spinal stenosis and compression of the spinal cord, forgoing surgery and undergoing radiation therapy alone may be an option.

KEYWORDS: Solitary plasmocytomas, Spinal cord compression, paraplegia, radiotherapy.

INTRODUCTION

Bone plasmacytoma is a malignant tumor that represents 4% of proliferative syndromes dominated by multiple myeloma.

Its diagnosis is based on the histological confirmation of plasma cell proliferation, the absence of its medullary diffusion and the unique character of the lesion. It is a disease that most often affects the axial skeleton, particularly the vertebrae. The reference treatment is radiotherapy, sometimes combined with surgery. The risk of developing multiple myeloma in 44 to 64% of cases makes the disease so serious that patients must be closely monitored.

We report, on this subject, an observation of a patient presenting a solitary vertebral plasmacytoma causing a medullary compression with paraplegia as a consequence. Through which we will recall the modality and the procedures of treatment in radiotherapy.

Case presentation

- Motif**:** back pain followed by muscular weakness of the lower limbs. manipulation by an osteopath with the appearance 48 hours later of a difficulty to walk, motor deficit with motor testing at 0/5 in the lower limbs for 1 week with ROT +/+ in patellar present not sharp, not polykinetic with Babinski indifferent to both feet,
- Personal History: Medical : Chronic renal failure. Amyloidosis. Dialysis 3 times a week, for 2 ½ years. Arterial hypertension, for 3 years.

Surgical: RTUP

- Family history: Father, deceased at 90 years old. Mother, deceased at 83 years. 1 sister: amyloidosis with mutation 554 lysine alpha chain of fibrinogen. 1 sister: renal transplant on amyloidosis. 1 sister: waiting for a renal transplant on amyloidosis.And 4 sisters, genetic assessment carried out in the family and which confirms it.
- History of illness: The symptomatology begins with lumbar pain radiating to both lower limbs with limitation to walking. The patient was seen by his osteopath who gave him massages with essential oils, without any improvement. Appearance of paraplegia of the lower limbs.
- Imagings examinations: MRI of the spine (Fig 1 and 2): tumor-like tissue infiltrate of the T8 vertebral body with pathological fracture of the T8 vertebral horn (T1 ypersignal) with loss of >50% of the height, bulging of the posterior and peri-vertebral wall and especially anterior epidural tumor

contingent respensable of a tight ductal stenosis SCHZAS C with medullary STIR ypersignal opposite. bone edema added to a medullary infiltrate in T1 hyposignal of the adjacent vertebral bodies T7 and T9 of suspicious appearance.

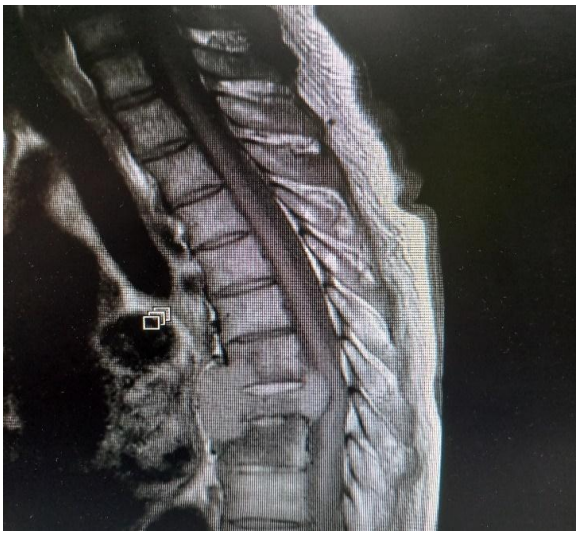

Fig. 1: Sagittal section shows the process centered on vertebra T8,

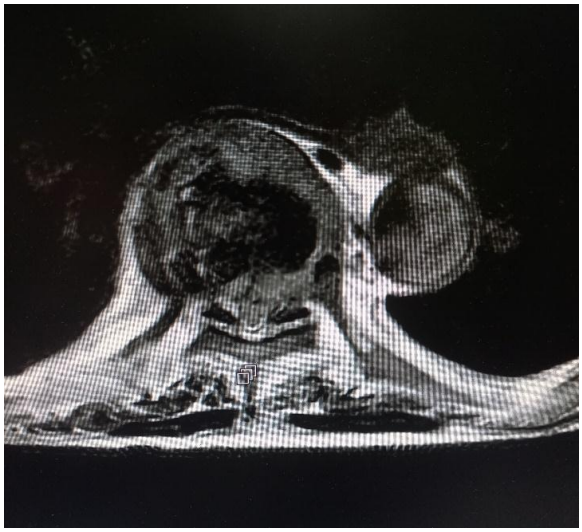

Fig. 2: Axial section

PET scanner (Fig 3) : Pathological fracture of the vertebral body of T8 on almost total hypermetabolic lysis, with contiguous infiltration of the soft tissues in contact extending posteriorly into the medullary canal, and partial lysis of the overlying and underlying vertebrae. no other suspicious focus on this whole-body examination, especially bone.
No extraosseous involvement.

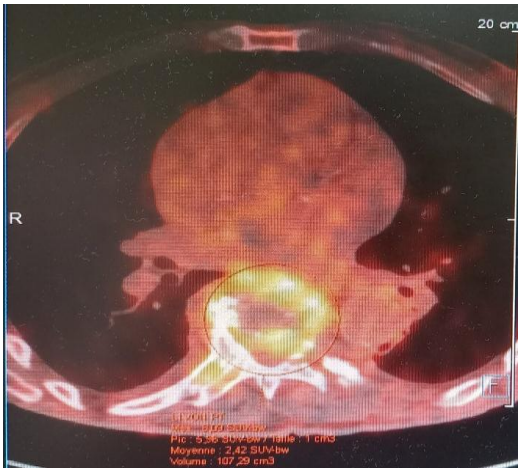

Fig. 3: Axial section shows a hyperfixing mass at T8 level.

- **Laboratory examinations**

A puncture biopsy of the lesion site indicated that a class of abnormal plasma cells was diffuse in the puncture tissue. The cell body is medium to large, and the cytoplasm is rich and slightly basophilic. The nucleus is round or slightly irregular and slightly deviated, some nucleoli are obvious, and mitosis is rare. Interstitial sclerosis was accompanied by hyperplasia of small vessels and scattered lymphocytes (fig 4).

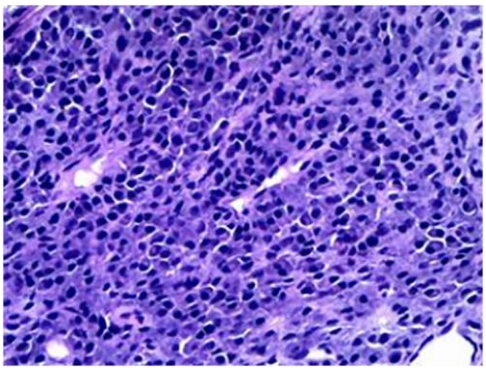

Fig. 4: Puncture biopsy at the site of the lesion revealed a proliferation of abnormal plasma cells in the puncture tissue.

- Therapeutic intervention : the steps of radiotherapy:

⇨ tracking scanner and contouring of target volumes (Fig 5 and 6)

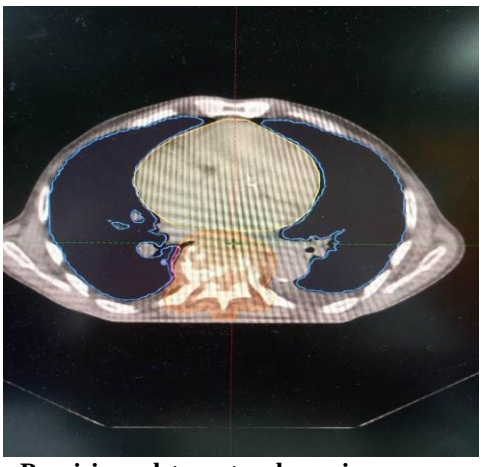

Fig. 5: Previsionnel target volume in orange, organe at risk (heart and lung).

- ⇨ dose and fraction: The patient received radiotherapy at a total dose of 44 Gy (1,8 Gy per day) for four weeks immediately after the diagnosis was confirmed. technique used is the VMAT, energy 6x
- ⇨ Dosimetry and treatment fields (Fig 6,7,8)

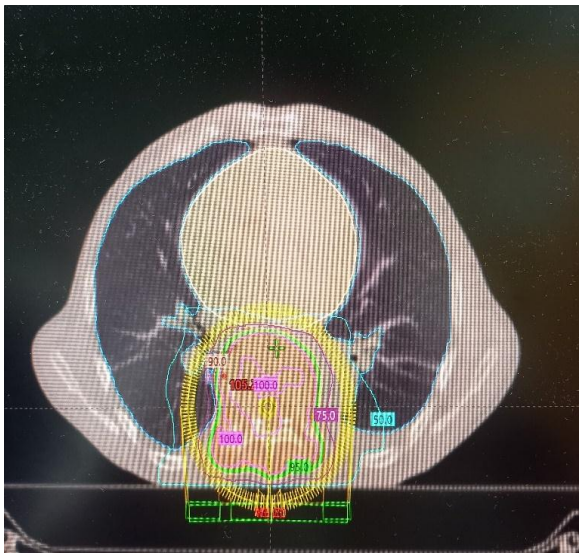

Fig. 6: dose distribution,

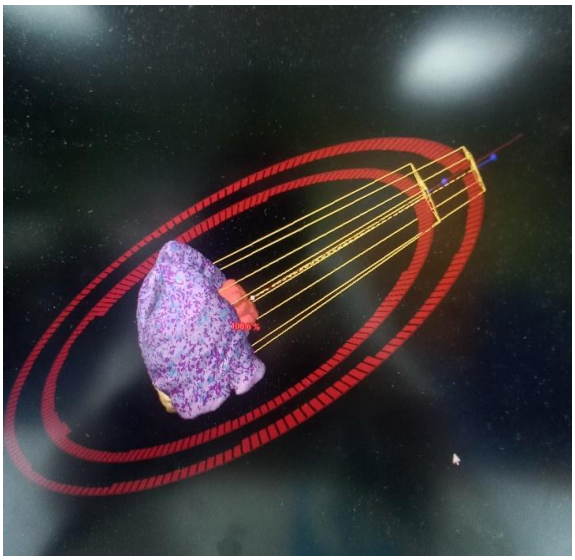

Fig. 7: Posterior treatment field.

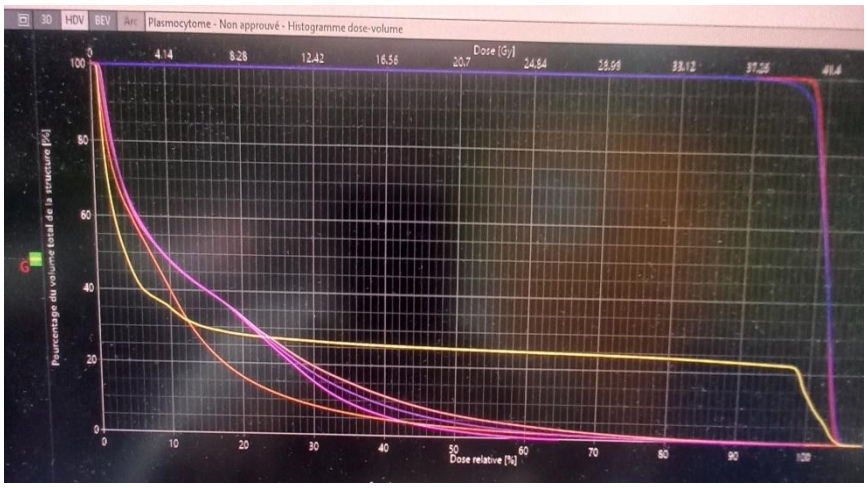

Fig. 8: Histogram dose volume (HDV).

DISCUSSION

Bone plasmacytoma is defined as a focal lesion composed of plasma cells but without bone marrow invasion, which distinguishes it from multiple myeloma. It is the most frequent form of plasma cell proliferation, its solitary form is rare and represents about 5-10% of all plasma cell dyscrasias.[1] The average age of onset of bone plasmacytoma is around 50 years with a clear male predominance. The tumor is located in the spine in 50% of cases, affecting in decreasing order of frequency the dorsal, lumbar, sacrum and cervical spine.[2,3] Solitary spinal plasmacytoma is often revealed by local pain and objective neurological signs found in three-quarters of patients, such as spinal cord compression, radiculalgia, etc.[1].[1] The distinction with myeloma is essential because plasmacytoma has a better prognosis. The positive diagnosis is based on several criteria; histology confirms the diagnosis of a plasma cell tumor by demonstrating a monoclonal plasma cell population. Biological (myelogram, protein electrophoresis, etc.) and radiological tests are necessary to rule out myeloma. However, the presence of a monoclonal peak is sometimes possible in 40% of the observations, typically its level is relatively low, while that of the other immunoglobulins remains normal, and its repeated measurement is an element of evolutionary surveillance.[4] The radiographic appearance is suggestive in the case of map osteolysis with a medullary origin blowing the cortical bone, plasmacytoma can be expressed by a condensing bone lesion giving the so-called "candle spot" appearance or rarely by mixed osteolytic and osteocondensing lesions.[5] MRI is a very sensitive technique for the detection of plasmacytomas. Indeed, 60% of plasmacytomas visualized on MRI were not visualized on standard radiographs. Moreover, MRI has the advantage of verifying the solitary character of the lesion and of specifying whether there is a tumor extension into the spinal canal. The lesion is hyposignal

in T1 and homogeneous hypersignal in T2, enhancing after injection of the contrast medium.[6,7] The radiosensitivity and radiocurability of solitary plasmacytoma of bone have been described for a long time. Radiation therapy is the reference treatment for solitary plasmacytoma of bone, either alone or in combination with surgery, and provides a local control rate of more than 90% with a very good tolerance and a rapid and long-lasting analgesic action.[8] The role of surgery in solitary plasmacytoma of bone is very limited. It is often performed for diagnostic purposes and should not be extensive or mutilating. It is only justified in the case of laminectomy for decompression in spinal locations without prior histological evidence, or for orthopedic repair in the case of a fracture or threat of fracture, thus allowing radiotherapy to be carried out under comfortable conditions.[8] The prognosis of solitary plasmacytoma of bone remains dominated by the risk of multiple myeloma. The predictive factors of this myeloma transformation are the existence or persistence of a monoclonal peak one year after radiotherapy or after surgical treatment. More recently, other factors have been reported, such as an elevated b2 microglobulin level and a decreased immunoglobulin level.[9,10] In case of a high risk of myeloma occurrence, it is necessary to perform a complete workup to detect an early form of multiple myeloma or a form with high potential for myeloma transformation that may justify the indication of early adjuvant chemotherapy.[11,12]

CONCLUSION

Bone plasmacytoma is a rare tumor, early diagnosis and appropriate treatment could reduce the progression to multiple myeloma. The treatment is essentially based on radiotherapy associated with surgery, depending on the case. Treatment with chemotherapy is currently being evaluated.

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