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SOLITARY BONE PLAMOCYTOMA: ABOUT 13 CASES

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INTRODUCTION

Solitary plasmocytoma (Sp) is a rare plasma cell dyscrasia, accounting less than 5% of plasma cell disorders. It is charecterized by a localized proliferation of neoplasic monoclonal plasma cells, with no radiological evidence of additional skeletals lesions, bone marrow with less than 10% plasma cell infiltration.[1]

Another fact, we must be sure that these patients don't have any signs and symptoms of multiple myeloma such as anemia, renal failure, hypercalcaemia, and the CRAB manifestation.

Solitary plasmocytoma could appear in 2 forms, solitary bone plasmocytoma (SBP) and solitary extramedullary plasmoctyoma (EMP). It depends on the origin of the lesion bones or soft tissue.[2]

Some of these patients have a small monoclonal protein detectable either in the serum or the urine.

SBP most frequently occurs in the axial skeleton, while EMP is observed in the head and neck area. These two enteties have different clinical presentation and prognosis from each other, so they must be clearly identified.[1]

Sp is a rare disease and most studies have been based on relatively small numbers of patients, so conclusions are not very well based. The ultimate risk of EP is the progression to Multiple Myeloma which greatly affects prognosis.[3]

In the current study we retrospectively have analyzed the clinical features, treatment strategies, outcomes and prognostic factors of a serie of 13 patients with only Solitary bone plasmocytoma treated at our institution.

MATERIALS AND METHODS

Between january 1995 and december 2015, 13 patients were diagnosed with SBP, they were evaluated and treated in the Radiation Oncology Department at Farhat Hached Hospital Susa Tunisia.

The histological diagnosis based on WHO classification system for haematological malignancies was perfomed with this following criteria : biopsy-proven plasma cell neoplasm, plasma cell monoclonality determined by immunohistochemical staining for kappa and lambda light chains, bone marrow aspirate and/or biopsy with <10%plasma cells, normal skeletal survey results, no anaemia, hypercalcaemia or renal failure attributable to plasma cell dyscrasia, little or no serum and/or urinary monoclonal immunoglobulins (level <20 g/l).

Recent investigation was included is the MRI scan of the primary lesion and spine pelvis area.

All patients in this study received a specific treatment that included surgery, radiation therapy, chemotherapy or a combination of this modalities.

Median dose of radiatherapy was 45.5 Gy and the chemotherapy regimen included MP (melphalan and predinsone), MD (melphalan and dexamethasone), VAD (vincristine, doxorubicin, dexamthesone).

Surgery consisted of a partial or total resection of the primary lesion. Response to therapy was evaluated clinically and radiologically. Local control (LC) was defined as the complete or partial disappearance of the lesion on radiographic imaging. Local relapse was defined using clinical and radiological evidence of local disease progression.

Clinical outcomes (Overall survival (OS), desease free survival (DFS)) was calculated using kaplan meier parametres.

Follow up is calculated since the diagnosis, the evolution is barely since the end of radiation therapy.

RESULTS

The median age of the 13 patients was 58 years (range 45 – 74 years old), patients were 3 aged <50 years and 9 patients were aged >50 years. Sex ratio was 2.25.

Disease Characterestic are Showen in Table 1.

Table 1: Population criteria.

Case	Sex/age (years)	Localization	Monoclonal globulin	Treatement (Surgery/Radiotherapy)	Evolution (months)	Follow up (months)	state
1	M/59	D6	NF	Lam+ RT44 Gy	MM(56)	60	Dead
2	M/57	L1	NF	Lam+RT44 Gy	MM(24)	30	Lost FU
3	M/45	C7	NF	Lam + RT45 Gy	LR(24)	30	Dead
4	F/71	Orbital	NF	No treatment	LE(6)	24	Dead
5	F/64	D6	NF	Lam+RT44 Gy	MM(15)	28	Dead
6	M/47	Sternum/clavicula	P	RT44 Gy	MM(6)	12	Dead
7	M/52	D6	NF	Tumor excision+RT44 Gy	MM(48)	120	RC
8	M/53	D3	NF	Lam+RT44 Gy	MM(16)	117	RC
9	M/74	D12	NF	RT45 Gy	RC	48	RC
10	F/47	4th Rib	NF	Tumor excision+RT54 Gy	RC	122	RC
11	M/54	D12	P	RT44 Gy	MM(60)	80	Lost FU
12	67/F	Femur	NF	RT50 Gy	MF(6)MM(40)	88	Lost FU
13	65/H	C7	NF	RT44 Gy	MM(40)	44	dead

Lam: Laminectomy, RT: radiotherapy, MM: Multiple myeloma, RC: Complete RemissionMF: Multi focality, LR: Local relapase, FU: follow Up; NF: not found; P: present; M: male; F :Female

7/13 patients were evaluated at diagnosis with a MRI scan of the spine and pelvis, and no further lesions were found in addition to the primary one.

Immunofixation and electrophoresis detected a serum monoclonal componenet in 2/13 patients, Urinary bence jones protein was not found. Free light chain immunoglobulin value at diagnosis were not available, this test in not available in our institution.

SP was localized at vertebral axial skeleton in 9/13 patients, extra axial SP was founded in 4 patients.

12 patients were evaluable for treatment response and outcome, 1 patient did not receive any treatment because of the localization (orbite) and heavy antecedents.

The treatment consisted of surgery and radiotherapy. 5 patients were operated by laminectomy followed by a radiation therapy. Exclusive radiation therapy without surgery was observed in 7 patients. (Table II)

Partial or eradicative excision was performed in 2 patients.

Radiation therapy was delivered on 12/13 patients, with median dose of 45.5 Gy (range 44-54 Gy).

Treatment response defined as LC, was observed on 10/13(76%) without a difference between the treatment used radiation therapy only or combined with surgery.
9 patients developed a MM after a median delay of 26 months (range 5–48 months). prognostic factor of progression To MM was the axial SBP on 6/9 patients and age over 50 years on 8/9 patients.

After a median follow up of 54 months (range 12-108 months), 4 patients were alive, 7 patients had died after progression to MM and 3 patients were lost to follow up.

Overall survival at 3 and 5 years is 76.2 % et 45 %

DISCUSSION

In the present study, the data of a single instution data of SBP was collected and analysed after a median follow up of 4-5 years (61.7 months).

Solitary plasmocytoma is a rare form of plasma cell dyscrasia. Our study concerns only Solitary bone plasmocytoma which is localised only in bones. The SBP had an updated definition due to the development of imaging techniques and because two different prognosis. IMWG (International Myeloma Working Group)[1] define 2 type of Solitary plasmocytoma, solitary plasmocytoma without bone marrow invasion which presents only 10% risk of progression to MM and Solitary plasmocytoma with bone marrow invasion (< 10%) which attempts 60% progression to MM.[2]

That's why the bone marrow invasion must be correctly analyzed because it have a greater impact on Multiple myeloma Progression.

The epidemiology of the SBP was explored by different studies, a large retrospective US Study, analyzed both bone and extramedullary solitary plasmocytoma diagnosed between 1992 and 2004 and found a predominance of elderly and male patient.[4]

Our study results confirms these data of prevalence of elderly and male patients.

The uptaded guidelines on the diagnosis and management of SP recommend to exclude the possibility of a systemic disease, that all patients diagnosed with plasmocytoma undergo a complete staging that includes, Xray of the skeleton as a whole, bone marrow biopsy and blood tests.

Studies suggest to perform a whole body MRI to assess the possible presence of additional bone lesions.

Mouloupoulos and al. shows that MRI is more sensitive to detect another lesions redressing than the diagnosis from Solitary plasmocytoma to multiple myeloma.[5]

The role of positron emission tomography-computerized tomography PET-CT was discussed and appears to be a great test for the initial bilan and for the evaluation of the treatemnt.

At diagnosis, the sensitivity and specificity of PET/CT was higher than that of MRI of the spine and pelvis, because PET/CT was able to detect plasmacytoma lesions with a

larger scope compared to MRI.[7]

Unfortonulty we dont have already a PET-Scan or whole body MRI in our nation, so we cant evaluate the impact of this technique yet.

In our serie, the spine is the most comment site involved, in line with other studies[2,3]

Due to the rarity of the disease, there are no randomized trial evaluating the best treatment approach, and the available data from small case series are somewhat controversial.

Surgery, which is essential for histological diagnosis (biopsy or partial/total deletion of the lesion), is also considered as a specific treatment for plasmacytomas or for particular localizations (spine with neurological damage, or vertebral fractures that require stabilization).

In our serie, 2 patient underwent a complete surgery and 1 patient with osteosynthesis. Five patients who did have signs of neuroligical agression (spinal cord compression) were proceeded with laminectomy followed by adjuvant radiotherapy.

Radiotherapy is the treatment of choice for solitary plasmocytoma, although its efficacy has been tested in small retrospective series. We confirm that patients with SP show excellent response rate. The dose of radiotherapy has not an influence in response rate and no documentation founded confirming it. Some authors therefore suggest a dose between 40-50 Gy for smaller lesions and > 50 Gy for greater lesions. Others authors shows that a dose < 35 Gy is sufficent for smaller lesions < 5cm while greater lesions > 5 cm must be treated with dose 40-50 Gy.

The multicentre study of the Rare Cancer Network, which analysed more than 258 patients with SP and a series of 46 SP patients treated at the Princess Margaret Hospital, produced no evidence of improvement in terms of LC with radiotherapy doses >30–35 Gy. This is in contrast with other series where it is asserted that radiotherapy doses >45–50 Gy provide better local response rates.[8] In our series the median dose was 45.5 Gy which is concordant with others studies with no differences between higher or lower doses although the small group of patients.

Despite the excellent response rates obtained with radiotherapy, patients with SBP progressed to MM more frequently, this be explained with the lack of Whole body MRI which can redress the diagnosis to Multiple myeloma.

The role of chemotherapy remains controversial in the SBP, some authors suggest to start with the combination with local radiotherapy for patients with initial SBP. A prospective study even with small group suggests that the initial combination treatment compared to radiotherapy alone has some benefit. In our study, none of our patient receive initial chemotherapy combined to radiation therapy and this treatment was reserved to patients who progressed to multiple myeloma.

Solitary plasmocytoma have some prognosis factors but it’s difficult to identify them, which are distributed in the various case reported in the literature.

Among those factors cited in the literature, age, lesion size, localization, presence of M-protein have been reported.[8]

Due to the rarity of the disease, our serie of 13 patients followed over 5 years at a single centre institution can offer some information. The SBP can be treated with radiation therapy and surgery. The high progression rate to multiple myeloma observed in our institution is explained maybe by the lack of imaging which it shows the importance intial MRI.

CONCLUSION

The SBP is a rare disease, initial bilan is crucial and benefits now of the development of new techniques of imaging PET-CT and whole body MRI. The main risk is the progression to Multiple Myeloma so close follow up is primordial to be detected early and treated with efficiency.

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