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Case Report

Solitary plasmacytoma of the rib: A rare tumor to keep in mind: Case report ☆,☆☆

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ABSTRACT

Around 5% of plasma cell neoplasias are solitary plasmacytomas, a tumor that is fairly rare. The presence of a localized tumor composed of monoclonal plasma cells that are the same as those found in multiple myeloma and the absence of symptoms that would suggest a disseminated form are used to establish the diagnosis. The thoracolumbar spine is the area most affected. Costal origin is infrequently described. In our case, the patient manifested a right anterosuperior chest wall mass. Imaging showed a mass of tissue with a significant zone of osteolysis of the first rib and no chest wall infiltration. Blood protein immunoelectrophoresis disclosed a monoclonal kappa type IgG. Bence-Jones proteinuria was positive, further suggesting a plasmacytoma of the rib. A percutaneous needle biopsy for pathology study and immunohistochemistry enabled the diagnosis of costal plasmacytoma. Search for other localizations was negative and the diagnosis of solitary plasmacytoma was retained. The patient received radiotherapy and has remained in remission for over a year. The pathology and imaging findings are used to make the diagnosis. Radiotherapy is the therapy of choice, but it presents a risk of progression to other bone lesions, medullary plasmacytosis, and multiple myeloma. There are no known factors that predict systemic recurrence. Surveillance is essential on a regular basis.

Introduction

A small subset of hematological malignancies known as plasma cell dyscrasias makes up 10% of all hematological neoplasms. Plmasmacytoma is further split into extramedullary plasmacytoma and solitary bone plasmacytoma. Less than 5% of all plasma cell dyscrasias are solitary bone plasmacytomas, making them rarer than other plasma cell dyscrasias [1,2]. The presence of a confined tumor made up of monoclonal plasma

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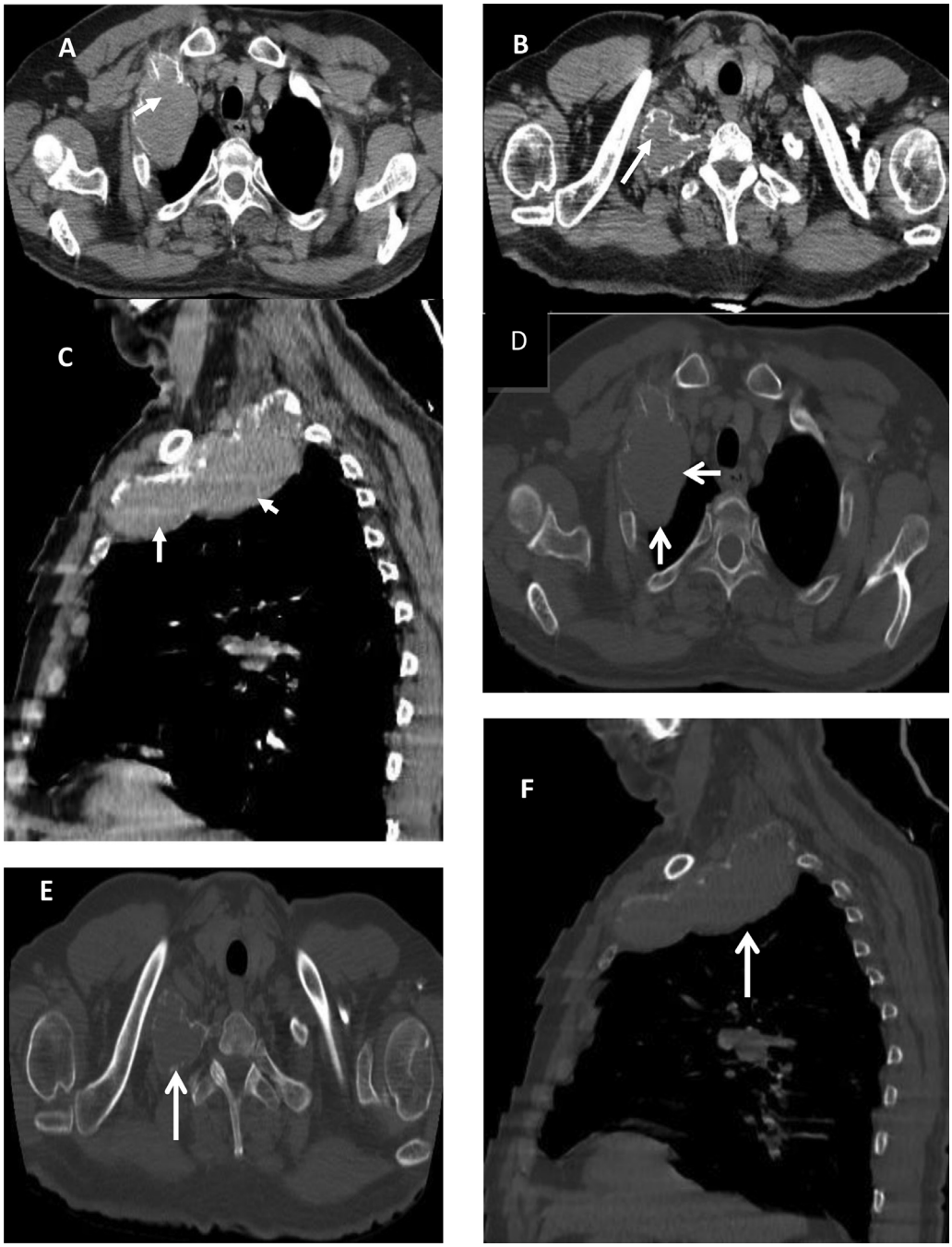

Fig. 1 – Contrast-enhanced computed tomographic scan chest in the mediastinal parenchyma window, in axial section and sagittal reformatted scan (A-C), and the bone window in axial section and sagittal reformatted scan (D-F), all showing a mass of tissue with a large zone of osteolysis of the right first rib without intrinsic calcification or infiltration of the chest wall(white arrows). No associated mediastinal lymphadenopathy or intrapulmonary infiltration was evident.

cells that are the same as those found in multiple myeloma, as well as the lack of symptoms that would indicate a disseminated form, are what lead to the diagnosis [3,4]. We present a case of single plasmacytoma at the origin of the rib, for which computed tomography proved useful in assessing the size and extent of the tumor and in indicating the right diagnostic palette, which was narrowed down by histology.

Case report

We present the case of a 48-year-old man with no prior surgical, medical, or familial history, who has been experiencing a painless lump on the right anterior chest wall without a fever for the previous 4 months. The clinical examination revealed

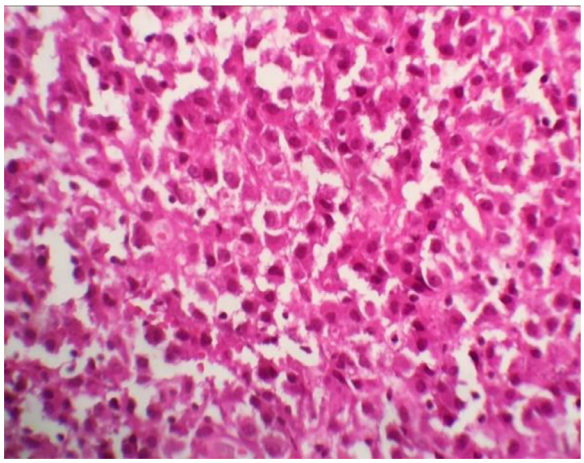

Fig. 2 – Biopsied specimens showed a proliferation of monomorphic cells with eosinophilic cytoplasm and eccentric nucleus.

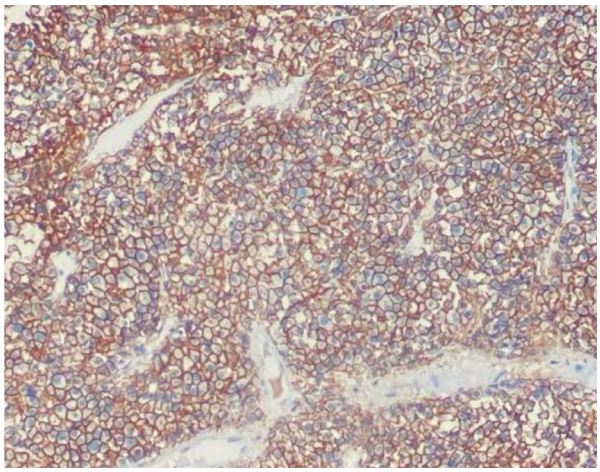

Fig. 3 – Positive immunostaining with anti-CD138 antibody.

a soft painful mass with no signs of superficial skin irritation or lymphadenopathy.

The thoracic computed tomography (Fig. 1) revealed a mass of tissue with a large region of osteolysis of the right first rib without invasion of the chest wall or intrinsic calcification. There was no sign of any intrapulmonary infiltration or concomitant mediastinal lymphadenopathy. The tumor mass showed no signs of cartilaginous calcification that would indicate chondrosarcoma.

The diagnosis of probable plasmacytoma was made based on the tumor's CT appearance and its position within the bone. A CT-guided transcutaneous needle biopsy of the mass then corroborated the diagnosis. The specimens revealed a multiplication of monomorphic cells with eosinophilic cytoplasm and eccentric nucleus, positive immunostaining with anti-CD138 antibody (Figs. 2 and 3).

IgG monoclonal kappa type was found by blood protein immunoelectrophoresis. Proteins from Bence Jones were also detected in urine. The results of the iliac bone marrow aspiration biopsy showed no signs of myeloma. Other localizations were not found, and the blood count, calcemia, and kidney panel were all normal.

In light of this presentation, the diagnosis of costal solitary plasmacytoma was affirmed. The patient has received radiotherapy (45 Gy in 29 sessions during 6 weeks). A year later, the patient is currently in remission, without evidence of local recurrence and systemic spread of the disease.

Discussion

Solitary bone plasmacytoma is distinguished by the absence of systemic or diffused proliferative plasma and a localized infiltration of malignant plasma cells [5]. Its slow evolution and isolated, local nature serve to define it [6]. It is a rare disease that affects less than 5% of plasma cell tumors [4,5,7,8] and it can affect any bone, with the dorsolumbar spine being the most often affected region in 30%-40% of cases and the long bones in 20%-40% of cases [4,9,11–13]. Costal involvement is uncommon; among 206 cases of bone plasmacytoma, Knobel et al. reported 18 cases of costal plasmacytoma [14]. In Japanese literature, 14 cases of solitary plasmacytoma of the rib origin have been reported [7].

Solitary bone plasmacytomas still don't have an established cause. Although no correlation has ever been proven, risk factors such as genetics, radiation exposure, and chronic antigenic stimulation have all been suggested [2]. In our case, we were unable to identify any specific exposure or noteworthy history.

Our patient's age is within the range of 40-50 years described in the literature, which is roughly 10 years younger than the age range for multiple myeloma. With a sex ratio of 3 to 4, there is a definite masculine predominance [4].

Solitary plasmacytoma of bone can cause parietal pain, neurological diseases due to compression, such as peripheral neuropathy [15], or even Claude-Bernard-Horner syndrome [16].

When it comes to radiological evaluation, a spiral CT is the best option. On a CT scan, plasmacytomas are often observed as well-defined, "punched-out" lytic lesions with an extrapleural soft tissue mass nearby. In advanced plasmacytoma, the bone cortex is frequently markedly eroded, expanded, and destroyed. Sometimes, there is also heavy ridging around the periphery, giving the tumor a "soap bubble" look [5,6,10]. In addition to bone lysis, magnetic resonance imaging displays a signal that is similar to muscle in T1 and more intense in T2 [3,8].

Histological evidence of plasma cell proliferation, absence of bone marrow spread, the isolated character of the lesion, and the absence of anemia, hypercalcemia, and renal failure suggestive of diffuse myeloma are the criteria for diagnosis of solitary plasmacytoma [3,4,11].

Chondrosarcoma, lymphoma, metastasis, osteosarcoma, fibrosarcoma, histiocytoma, chondroma, lipoma, and bone infarction are among the diseases in the differential diagnosis for costal plasmacytoma [5,7].

Whether used alone or in conjunction with surgery, radiotherapy is still the go-to treatment for solitary bone plasmacy-

tomas (mainly for diagnostic purposes). Radiotherapy at doses of 40-50 Gy gives excellent local control for more than 90% of patients, with extremely good tolerance and long-lasting analgesic impact [8,13]. However, it is known that bone plasmacytoma advances to multiple myeloma (MM) more commonly than soft-tissue plasmacytoma in terms of long-term outcomes [14]. Chemotherapy may be suggested in cases with aggressive histological types, disease progression, and some forms with high initial tumor masses, although the majority of studies have not demonstrated any benefit in terms of local control or overall survival [4].

The prognosis is generally positive, with a median survival of more than 10 years [12], but it is dominated by the risk of multiple myeloma, which occurs in 31%-75% of patients depending on the series [13]. Age over 52, spinal location, the presence or persistence of a monoclonal peak 1 year after treatment, and more recently, high levels of 2 microglobulin and osteopenia, are all thought to be predictors of myeloma transformation [4,10].

Conclusion

When faced with a lytic tumor of the rib on imaging, solitary costal plasmacytoma should be considered, but the diagnosis is confirmed by pathology. Surgery and radiotherapy are the mainstays of the therapy.

Author's contributions

All authors contributed to this work. All authors have read and approved the final version of the manuscript.

Patient consent

Written informed consent for publication was obtained from patient.

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