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CASE REPORT

Solitary dural plasmacytoma with parenchymal invasion

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ABSTRACT

Summary: Primary solitary dural plasmacytoma is an uncommon neoplasm of plasma cell. The clinical presentation and neuroradiological findings of these tumors may be deceptive and resemble to the other most prevalent brain tumors. Solitary plasmacytoma mostly shows a benign behavior and malignant features like local invasion is so rare. We describe the case of parenchymal brain involvement by solitary dural plasmacytoma.

Key words: Brain mass, dural layer, parenchymal invasion, solitary plasmacytoma

Introduction

Intracranial plasmacytoma is a plasma cell tumor that affects the skull, meninges, and brain.[1-3] Plasmacytoma may be solitary or multiple and based on their origin can be divided into intramedullary (osseous) and extramedullary (non-osseous).[4]

Solitary dural plasmacytoma (SDP) is a benign, single tumoral lesion of plasma cell without clinical or radiological evidence of systemic myeloma which may be progress to malignant multiple myeloma.[1,2]

Only a few case reports of primary dural plasmacytoma have been described in the literature. From these reports, patients were likely developed a benign intracranial plasmacytoma although aggressive features like local brain invasion may be a rare entity.[5-12]

The clinical presentation and the neuro-radiological findings of these tumors may be deceptive and resemble to the other most prevalent tumors which required more evaluations.

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We are reporting another case of SDP which showed aggressive behavior and presented with parenchymal brain involvement.

Case Report

A 47-year-old man suffered from chronic headache, left hemiparesis, mood depression, and two episodes of generalized tonic colonic seizures 3 months before was admitted to our hospital. He had no significant medical history. Systemic and neurological examinations revealed only left hemiparesis.

A computed tomography (CT) scan revealed a homogenous, isodense right frontal brain mass. The lesion had no calcification and hyperostosis. Brain MR imaging showed a lesion in the right frontal lobe which was hyper intense on Coronal T_1-weighted sequences [Figure 1a] and iso intense on sagittal T_2-weighted sequences [Figure 1b]. The lesion had significant mass effect, surrounding edema and parenchymal invasion. A Gadolinium-enhanced T_1-weighted MR image demonstrated the homogenous enhancement of the lesion.

With the primary diagnosis of high graded primary brain lesion or metastasis, the patient underwent craniotomy. A soft, reddish gray lesion that had eroded through the adjacent skull bone was discovered. The dura matter was thickened and involved and the lesion was not demarcated from surrounding pia matter and brain tissue. The tumor together with the involved dural matter was removed and duroplasty was performed.

Microscopic examination showed diffused mono-morphous, monoclonal plasma cells proliferation with infiltrations into the normal brain tissue and adjacent dura matter [Figure 2]. Immunohistochemical analysis revealed a monoclonal

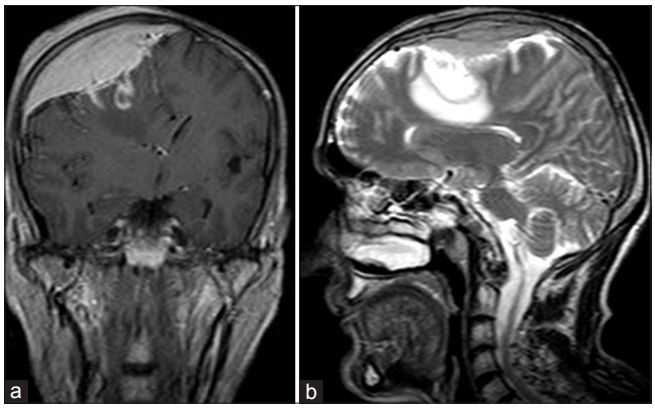

Figure 1: (a) A Coronal T1-WI demonstrates a hyper intense lesion in the right frontal lobe with significant mass effect also brain parenchymal invasion is noted; (b) A Sagittal T2-WI shows iso intense lesion with mass effect and parenchymal invasion. Surrounding brain edema is demonstrated

IgG-kappa secretion in the tumor cells which were consistent with the diagnosis of dural plasmacytoma.

Postoperative systemic evaluation included bone marrow examination, bone scan, and skeletal survey to exclude multiple myeloma which were normal and showed no evidence of systemic involvement. There was no demonstration of monoclonal gammopathy (M component) in serum and urine protein electrophoresis. Moreover, there were no evidence of hyperglobulinemia, hypercalcemia, anemia, and related organ or tissue impairment.

Several days later after surgery, the patient was discharged from hospital without any neurological deficit.

We followed up the patient to rule out progression of disease to systemic Multiple Myeloma and our patient was free from systemic progression for last 9 months although future course remains to be seen.

Discussion

Plasma cell tumors are classified as extramedullary plasmacytoma, intramedullary plasmacytoma, or multiple myeloma. Extramedullary plasmacytomas are rare lesions that are originating from dura matter.

Solitary extramedullary plasmacytoma is a rare neoplasm with benign behavior and its diagnosis is made pathologically with systemic evaluation to rule out multiple myeloma, plasma cell granuloma, and meningioma.[1,13]

The clinical presentations of plasmacytomas depend on the tumor site and its extension. These tumors are mostly presented as either bone or soft tissue lesions with different manifestations of mass effects, pain and infiltration. The vascular structure of dura matter permits the extension of plasma cell tumors from primary contiguous bone to the

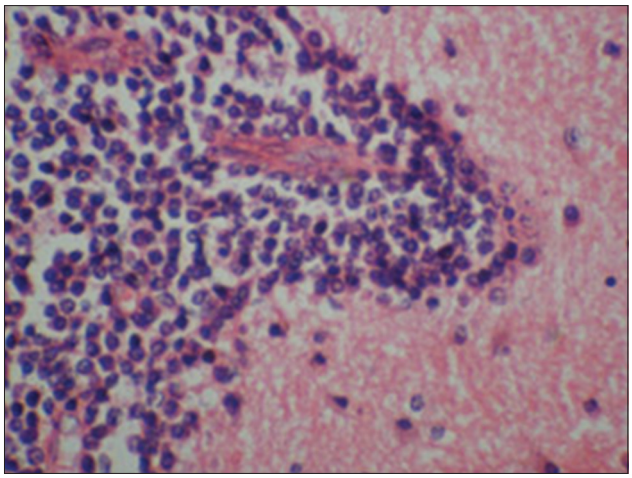

Figure 2: Microscopic view: Diffuse proliferation of plasma cells is seen in the background. Plasma cells are mostly mature and there is infiltration into the normal brain tissue (hematoxylin and eosin stain, original magnification ×40)

subsequent subdural space, but primary dural involvement is often rare.[5-12] Intracranial plasmacytomas are associated with cranial nerve palsies and clinical manifestation of space-occupying lesions such as headaches, visual problems, seizures, or paresis.[13-17] As in our case, the patient had headache, left hemiparesis, and seizure.

Computed tomography (CT) scan and magnetic resonance imaging (MRI) are the main imaging methods to diagnose intracranial involvement of plasmacytomas and MM.

On CT and MRI, SDP usually appears as homogenous mild to moderate contrast enhancement mass with respect to brain tissue.[16] On MRI, SDP is usually iso to hyperintense on T_1-weighted images and iso to hypointense signal on T_2-weighted images related to normal white matter.[2,16,18]

Although the radiological imaging findings are often nonspecific and there may be considerable overlap with a variety of neoplasms and inflammatory process, it can be helpful in early detection of recurrent lesions.[2,14,16,19]

In this case, based on imaging our primary differential diagnostic considerations included invasive parasagittal meningioma, high graded glioma or metastasis, but the features that suggested the diagnosis of SDP in our case were the histopathological findings and the absence of systemic manifestations of multiple myeloma.

Our histopathological findings were diffused monoclonal plasma cells proliferation with infiltrations into the normal brain tissue and adjacent dura matter that was consistent with the diagnosis of dural plasmacytoma with brain invasion.

As we mentioned above, in this case systemic evaluations (bone marrow examination, bone scan and skeletal survey) were normal and showed no evidence of systemic involvement

which excluded multiple myeloma. Also, there was no evidence of monoclonal gammopathy (M component) in serum and urine protein electrophoresis which is seen in 99% of multiple myeloma. Moreover, there was no related organ or tissue impairment. Therefore, primary invasive SDP was confirmed according to clinical, radiological, and pathological studies.

As far as SDP and MM have similarities in their histopathology, we must differentiate them from each other because the treatment modality and prognosis of these two pathological entities are radically different.[15]

Intracranial plasmacytoma is very radiosensitive but the definitive treatment is complete surgical resection of the tumor plus radiotherapy.[1,16] Chemotherapy may be considered for patients with refractory or relapsed disease or tumors larger than 5 cm.[20]

In our case, due to invasion of tumor to surrounding brain tissue subtotal surgical resection with radiotherapy were performed. We followed up the patient to rule out progression to multiple myeloma. The patient was free from systemic progression for last 9 months although future course remains to be seen.

Conclusion

Although SDP is a rare benign entity, the possibility of brain invasion should be taken in to account. We concluded that SDP should be considered in the differential diagnosis of any solitary dural mass, and these patients should undergo complete systemic evaluation to exclude MM. Furthermore, the treatment and prognosis for each of these pathological entities are radically different.

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