IMAGING FINDINGS OF A PATIENT WITH CLIVAL PLASMACYTOMA IN RELATION TO MULTIPLE MYELOMA

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ABSTRACT

The clivus is a component of the central skull base. Plasmacytomas rarely occurs at clivus as a local form of plasma cell tumors. Hereby we present a case of 62 year-old male patient who was diagnosed as multiple myeloma two years ago in relation to a sacral plasmacytoma. The patient had complaints of headache and diplopia for 5 days. The magnetic resonance imaging (MRI) revealed a centrally located lesion at clivus with homogeneous isointense signal intensity on T1 and T2 weighted images. After gadolinium, homogeneous contrast enhancement was observed. The sixth cranial nerve could not be detected due to compression of the mass as the possible cause of diplopia.

Keywords: Clivus, plasmacytoma, multiple myeloma

INTRODUCTION

The clivus is a component of the central skull base. Plasmacytomas rarely occurs at clivus as a local form of plasma cell tumors. Hereby we present a case of 62 year-old male patient who was diagnosed as multiple myeloma two years ago in relation to a sacral plasmacytoma. The patient had complaints of headache and diplopia for 5 days. The magnetic resonance imaging (MRI) revealed a centrally located lesion at clivus with homogeneous isointense signal intensity on T1 and T2 weighted images. After gadolinium, homogeneous contrast enhancement was observed. The sixth cranial nerve could not be detected due to compression of the mass as the possible cause of diplopia.

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INTRODUCTION

The clivus is located at the junction of the basilar occipital bone with the sphenoid bone. On axial planes, it can be detected at the posterior of the sphenoid sinuses. Plasmacytomas are categorized in relation to the localization of involvement as extramedullary plasmacytomas of bone (EMP) and solitary plasmacytomas of bone (SPB). SPB and multiple myeloma (MM) combination occurs more frequent than EMP and MM1. The diagnosis of SPB is related with clinic and laboratory findings. Radiologically solitary bone lesion can be detected. Certain diagnosis is made by histopathological examination of a biopsy from the mass of material. The clivus is located at the posterior region of the sphenoid sinuses and rich in bone marrow as petrous apex2. Therefore, solitary plasmitositoms may occur more often in this locations (2).

In this case report, we present a case of a solitary plasmacytoma of clivus associated with multiple myeloma and review imaging findings of plasma cell tumors.

CASE STUDY

A 62 year-old male patient, was detected with lumbar and pelvic computed tomography due to chronic back pain two years ago and the scan revealed a 5 x 4 cm sized expansile osteolytic sacral bone mass. Plasmacytoma were diagnosed after biopsy. Laboratory
findings were normal, but owing to the rate of plasma cells in the bone marrow, it was finally diagnosed as multiple myeloma. The patient was treated with chemotherapy and focal radiotherapy. The patient underwent an autologous bone marrow transplantation after remission. The patient had no complaints for two years and admitted to the hospital with diplopia and headache for recent 5 days. Later the patient underwent magnetic Resonance Imaging (MRI) (MAGNETOM Avanto 1.5T Siemens Medical Solutions, Erlangen, Germany) and the scan showed a mass centered in the clivus with homogeneous isointense signal intensity on T1 and T2 weighted images. After (Gadovist; 0.1ml/Kg) injection, heterogeneous contrast enhancement was detected (Fig. 1A,1B,1C,1D,1E). Diffusion restriction was available and a compression on the sixth cranial nerve was detected. The lesion was diagnosed as clival plasmacytoma due to clinical findings and typical MRI scan results. The reduction of the complaints occurred following radiotherapy.

Figure 1. Sagittal T1-weighted (A) and coronal T2-weighted (B) MR images show an irregular isointense mass in the clivus. The tumor was heterogeneously intense enhanced with Gd. (C: coronal, D: sagittal E:Axial).
Clival plasmacytoma in relation to multiple myeloma

Figure 1B
Clival plasmacytoma in relation to multiple myeloma

Figure 1C
Figure 1D
DISCUSSION

Plasmacytoma is a localized mass of neoplastic plasma cells. Plasmacytomas are classified as extramedullary plasmacytomas of bone and solitary plasmacytomas of bone (1). Involvement of the clivus is relatively rare. The plasmacytoma of the skull base was categorized into two groups as anterior (nasopharyngeal) and central (sphenoid, clivus, petrous apex) lesions by Wein et al. Most of the anterior skull base plasmacytomas are usually diagnosed as EMP group and the plasmacytomas have been determined in SPB group. The distinction influences the prognosis, because the likelihood for progression to MM or combination with MM is more often for central lesions rather than anterior group (63.6% vs 9.5%, respectively) 1. Our patient had an involvement of the clivus, that is a component of central skull base, therefore the lesion most probably falls into the group of SPB.

Solitary plasmacytoma of bone is more common between 40-70 years old and usually occurs in the 6th decade of life 3. Solitary plasmacytomas of bone, also known as medullary plasmacytomas, occur as isolated lytic lesions such as our case. Men are affected more frequently than women 4.
Skull base plasmacytomas can be asymptomatic, but larger tumors cause cranial nerve deficits. Involvement of the sixth cranial nerve in Dorello’s canals on the posterior surface of the clivus may lead to diplopia as can be seen in our case. Osteolytic lesion regarding the plasmacytomas can be identified on X-ray film. However, both CT and MRI scans provide significant contribution for the diagnosis of plasmacytomas. CT scan is certainly more sensitive than radiographs for examining the bone destruction. MRI provides the optimal assessment of bone marrow involvement and, even if when trabecular bone is intact, the MRI scan is more sensitive for lesion located in bone marrow.

Owing to the patient's complaints we chose first MRI as the primary diagnostic tool. The MRI appearance may be either isointense, hyperintense or heterogeneous compared with the brain parenchyma on T1-weighted images and intense homogeneous enhancement by intravenous administration of Gd-DTPA. We have detected a similar enhancement pattern in MRI. It is also demonstrated as moderately hyperintense on T2-weighted imaging.

It is important to compare the marrow signal with adjacent pons on non contrast, non fat saturated T1 sequences in MRI and sagittal projection is most useful. The diagnosis can be confirmed by histopathological examination of the biopsy material obtained from the mass. It should be considered whether the lesion is a component of systemic plasma cell disorders such as MM or not.

Bindal et al. noted that petroclival infiltration is often associated with the development of multiple myeloma, like our case. For SPBs, chondrosarcomas and chordomas should be taken into consideration for differential diagnosis owing to their origin within the skull base. In contrast to SPBs, chondrosarcomas and chordomas are typically heterogeneous on scans and usually includes calcification. Dural based meningiomas, metastatic lesions and glomus tumors should also be considered in differential diagnosis as well. Medical history of the patient concerning MM and especially the high signal intensity on T1A images provided us the opportunity to make the differential diagnosis.

Moreover plasmacytoma is one of the most frequent malign lesions of clivus such as chondrosarcoma and metastases. Plasmacytomas are radiosensitive tumours, therefore radiotherapy is preferred treatment choice. Consequently, these lesions have an increased risk to be related with multiple myeloma.

CONSENT

The authors obtained written, informed consent from the patient for the publication of this article.

COMPETING INTERESTS

There is no conflict of interest.
REFERENCES