Case Report

A rare case of primary malignant melanoma of clivus with extensive skeletal metastasis demonstrated on 18F-FDG PET/CT

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ABSTRACT

Malignant melanoma of the clivus is a rare entity, for which there is little evidence-based literature for guiding clinicians to understand the importance of disease staging via noninvasive imaging strategy. This report highlights the case of a 55-year-old lady with histopathologically confirmed melanocytic melanoma of the clivus—postoperative status, with multiple skeletal metastasis, demonstrated on 2-deoxy-2-[18F] fluoro-D-glucose positron emission tomography/computed tomography (18F-FDG PET/CT scan). The experience gained with this patient demonstrates the feasibility and usefulness of this noninvasive application in accurate staging and hence, correct decision making regarding further treatment.

Keywords: 18F-FDG PET/CT, clivus, intracranial malignant melanoma

INTRODUCTION

Malignant melanoma is an aggressive disease which affects both skin and mucosal surfaces. It is less common than other skin cancers. In women, the most common site is legs and melanomas in men are most common on the back. Melanoma of the clivus is an extremely rare case presentation with only a few cases reported in the literature.[1,2] Conventional imaging techniques like computed tomography (CT) and magnetic resonance imaging (MRI) may be suboptimal in evaluating such tumor, and may lead to inaccurate staging. A multimodality whole body imaging technique, 2-deoxy-2-[18F] fluoro-D-glucose positron emission tomography/CT (18F-FDG PET/CT) is being increasingly used in oncology for staging of multiple malignancies to know the spread of the tumor in the body. This rare case is important because it highlights the extensive disease that can be caused by a clival tumor and the role of noninvasive imaging, that is, 18F-FDG PET/CT in correct staging and hence, guiding further management of the disease.

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CASE REPORT

A 55-year-old woman, presented to the hospital with chief complaints of headache, decreased vision in the left eye, and occasional episodes of vomiting since 3 months. MRI brain revealed altered signal intensity lesion with solid, hemorrhagic, and few cystic components in basiocciput, basisphenoid, clivus, sella, and right petrous apex; displacing optic chiasma superiorly. There was associated soft tissue component extending into cavernous sinus with partial encasement of cavernous segment of right internal carotid artery. CEMR study revealed a large moderately enhancing mass lesion involving the clivus with sellar-suprasellar extension with encasement of bilateral internal carotid arteries suggestive of plasmacytoma/chordoma or metastasis [Figure 1]. She underwent endonasal transsphenoidal excision of clival tumor and the black colored, relatively avascular tumor was confirmed to be melanocytic melanoma of clivus on histopathological examination. The patient was thoroughly examined to rule out any lesion on the skin and mucosa with other investigations including chest X-ray. A week after the surgery, this patient was referred to our department for a whole body 18F-FDG PET/CT scan for restaging. Whole body PET-CT scan was performed after intravenous (IV) administration of 10 mCi of 18F-FDG. PET and contrast-enhanced CT images were acquired and reconstructed to obtain transaxial, coronal, and sagittal views. Fused PET-CT images were then generated. The study revealed residual hypermetabolic well-defined lobulated soft tissue lesion in the basisphenoid and sella turcica region

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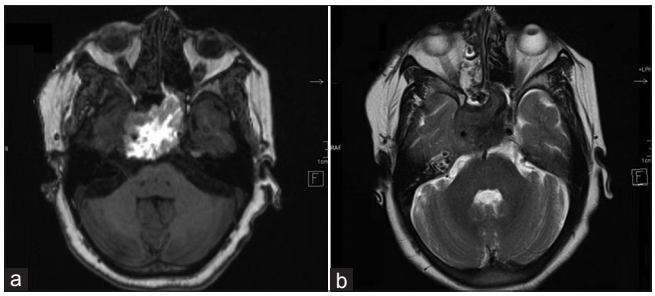

Figure 1: (a and b) Magnetic resonance images-T1 and T2 weighted axial sections of the brain (preoperative) showing altered signal intensity lesion with solid, hemorrhagic, and few cystic components in basiocciput, basisphenoid, clivus, sella, and right petrous apex; displacing optic chiasma superiorly associated with soft tissue component extending into cavernous sinus with partial encasement of cavernous segment of right internal carotid artery

extending into the extraaxial space of right middle cranial fossa causing destruction of the sella turcica, sphenoid sinus, dorsal sella, and clivus; suggestive of residual disease. Also multiple metabolically active skeletal lesions were noted suggestive of skeletal metastasis [Figure 2]. Thereafter, the patient was planned for palliative chemotherapy and brain irradiation.

DISCUSSION

There is a worldwide rise in the number of cases of malignant melanoma. Eighty five percent of the patients diagnosed in early stages can be cured with surgery. Primary intracranial malignant melanoma is a rare entity with incidence estimated to be 0.005 cases per 100,000 population.[3,4] The age of the patients usually range from 15-71 years, with a peak incidence in the 5th decade. Symptoms at presentation include headache; vomiting due to intracranial hypertension; hydrocephalus; focal neurological deficits due to compression of the brain, spinal cord, or cauda equina; subarachnoid hemorrhage; and seizures.[4] To our knowledge, very few cases of primary melanoma of the clivus have been cited in the literature previously. Metastases involving this area have been previously described as a single case report[2] or included in series with other skull base tumors.[3] In 2009, a literature review was performed by Pallini *et al.*,[5] which reveals that out of 46 patients who underwent surgery for clival bone tumor, seven proved to be metastatic, representing 0.18 and 0.42%, respectively of intracranial and skull base tumors which were treated in their institution in the study period between January 1995 and December 2007. The primary tumors associated were lung adenocarcinoma (n = 2), prostate carcinoma (n = 2), skin melanoma (n = 1), hepatocarcinoma (n = 1), and lung squamous cell carcinoma (n = 1). In 2010, Chaudhary *et al.*,[6] presented a case of an atypical clival meningeal melanoma treated with a multidisciplinary staged transcrural and transsphenoidal endoscopic surgical approach. Extensive imaging and dermatological workup did not demonstrate any primary source. No other metastases was evident for 2 years after initial symptoms and with no evidence of a cutaneous source, diagnosis of a primary meningeal lesion of the clivus was made.

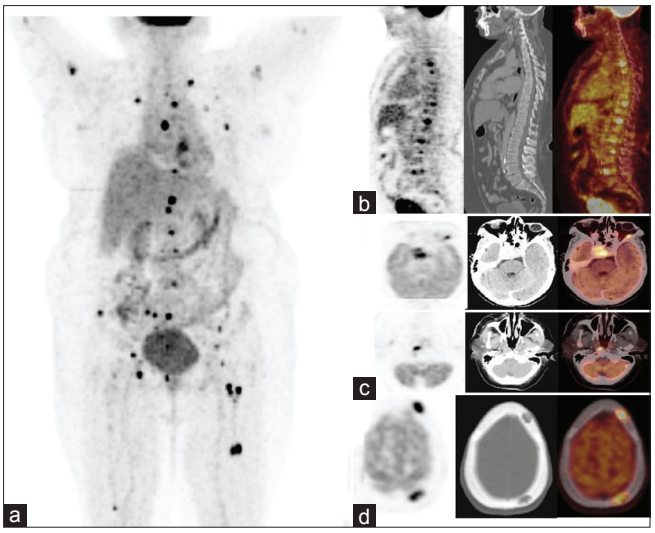

Figure 2: (a) Maximal intensity projection image of the patient from base of skull to mid-thigh showing focal areas of hypermetabolism throughout the body corresponding to multiple metastatic skeletal lesions. Physiological uptake noted in heart, liver, bowel, kidneys, and urinary bladder, (b) Sagittal positron emission tomography and fused PET-computed tomography images reveal abnormal fluoro-2-deoxy-d-glucose uptake in spinal column corresponding to lytic lesions on CT, (c) Metabolically active well-defined lobulated soft tissue lesion in basisphenoid and sella turcica region, extending into the extraaxial space of right middle cranial fossa and indenting the medial temporal lobe causing destruction of the sella turcica, sphenoid sinus, dorsal sella, and clivus, (d) Hypermetabolic lytic intradiploic lesions noted in left anterior frontal, high frontal, and parietal region

Bone metastases occur in a significant proportion of patients with metastatic melanoma. In such patients survival is short, and they have a high skeletal morbidity rate. A study was done by Kandukurti *et al.*, in 108 patients in 2008, which revealed median survival following diagnosis of bone metastases in malignant melanoma to be 3.2 months (range 0.3-47.4 months).[7] Bone metastases most commonly occurred in patients with the primary melanoma originating on the back and lower limbs and spine was the commonest site of bone involvement, followed by ribs, pelvis, long bones, and skull.

FDG PET is a sensitive and specific technique for patients with melanoma but has limitations with small (less than 1 cm), pulmonary, and brain metastases. It is felt to be superior to CT alone in detecting abdominal, nodal, subcutaneous, and skin sites. It is useful in assessing extent of disease in patients with surgically resectable disease by conventional methods as it may render them unresectable in a considerable population. In our patient, surgical removal of the tumor was done from an outside institution and was referred to us for further management. Residual tumor was visible on postop MRI scan. PET-CT scan was performed for the patient in view of histological diagnosis of melanocytic melanoma. Also, no primary site could be localized after thorough general examination of the skin. The findings on PET-CT scan suggest that the clival mass represents the primary site of malignancy. This case adds to the literature on the occurrence of intracranial malignant melanoma in patients with extensive skeletal metastasis, and supports the finding that such tumors need to be followed carefully.

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