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Case Report

Radiology Section

Magnetic Resonance Imaging (MRI) Appearances of Primary Amelanotic Malign Melanoma in the Nasal Cavity: A Rare Case

HEDIYE PINAR GUNBEY [1], EMRE GUNBEY [2], ASLI TANRIVERMIS SAYIT [3], KERIM ASLAN[4]

ABSTRACT

Malign melanoma of the nasal cavity that arises at such an unusual location is an exceptional case only occasionally mentioned in the literature. An amelanotic form, which is an uncommon type for this malignancy, also has an unusual radiological appearence from the classic melanotic form. We report here the magnetic resonance imaging (MRI) findings of a 46-year-old man who had a nasal cavity mass diagnosed as an amelanotic malign melanoma and discuss the importance of differential diagnosis with such an unusual radiological manifestation in this location.

Keywords: Amelanotic malign melanom, MRI, Nasal cavity

CASE REPORT

A 46-year-old man with no significant past medical history presented with complaints of facial pain, swelling in the nasal area and nasal obstruction. The patient had noticed the nasal obstruction three months ago, and it had worsened over time. He also had pain on the left side of his face and left cheek, and swelling on the left side of his nose. He denied any complaints of visual problems, epistaxis, headache or fever.

Detailed otorhinolaryngologic examination of the patient revealed a swelling on the left side of nose and the left maxilla with inspection. There was no proptosis and the eye movements were normal. There were no abnormal findings during oropharyngeal examination except purulent postnasal drainage. During nasal endoscopy right nasal cavity was normal. In the left side a black coloured, firm, non-bleeding mass filling the left nasal cavity was revelead. The left middle turbinate and nasopharynx could not be evaluated.

In the differential diagnosis benign and malign paranasal sinus tumours, lymphoma, metastasis and fungal sinusitis were considered, but the appearence was consistent with malign melanoma. A punch biopsy was done for pathological diagnosis and paranasal sinus, orbita and brain MR performed for characterization and involvement of the mass.

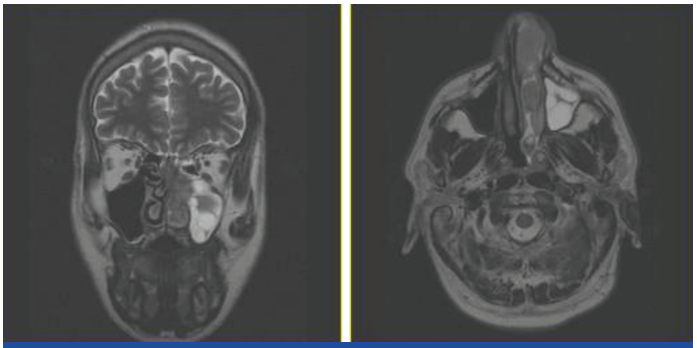
The patient was examined with a 1.5 T imager. MR studies included turbo spin echo T1W and T2W and FLAIR (fluid attenuated inversion recovery) imaging with axial, coronal and sagittal planes. Contrast enhanced T1W images were obtained with sagittal, coronal and axial planes. Paranasal sinus MR demonstrated a mass lesion filling the left part of the nasal cavity, obliterating the ethmoid cellulas [Table/Fig-1]. The lesion appeared isointense on the T1W image and heterogeneous -isointense to gray matter on the T2W image with diffuse homogeneous enhancement on postgadolinium T1W images [Table/Fig-1-3]. The medial wall of the left orbita and nasal septum was expanded by the mass. The ostiums of the left frontal and maxillary sinuses were obliterated with secretion. There were inflammatory changes in both maxillary sinuses [Table/Fig-2&3].

The MR of the brain and orbita demonstrated normal findings and there was no evidence of intracranial or intraorbital spread of the tumour. The patient had no history of previously diagnosed cutaneus or mucosal melanomas at other sites.

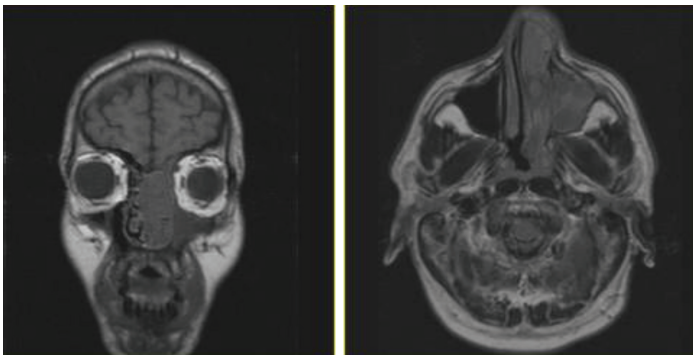
On histopathological examination, the mass was composed of compact large pleomorphic cells without melanin pigment and was hence diagnosed as amelanotic malign melanoma.

Because of these findings, the patient underwent a radical maxillectomy via a Weber-Ferguson incision under general anesthesia and to widen field of view the incision was extended below the orbita. Left maxillary sinus , pterygoid plate with nasal bone and ethmois sinus were excised with 1cm surgical limits. Intraoperative frozen section examination had revealed negative surgical margins. Orbital fat frozen tissue was also negative. Subsequently, the reconstruction of the defect in the orbital floor was performed with forearm free flap and temporalis muscle. The remainder of the operation was completed uneventfully.

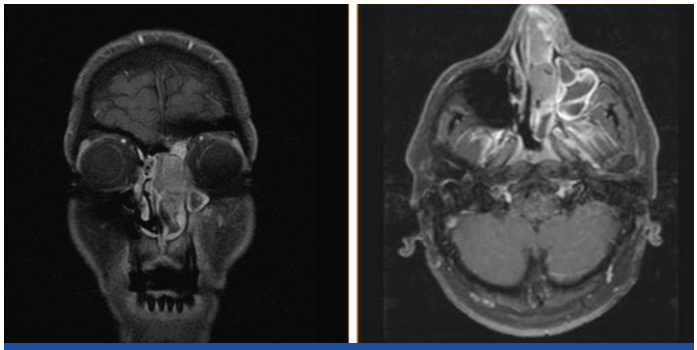
The final diagnosis was amelanotic melonoma and the patient was hospitalized for 15 days postoperatively. There was no recurrence at six months of postoperative follow-up of the patient and he is still being monitored at frequent intervals.



[Table/Fig-1]: The lesion filling the left part of nasal cavity and obliterating the ethmoid cellulas. It appeared heterogeneus -isointense to gray matter on T2 weighted sagittal (a) and axial (b) images



[Table/Fig-2]: The lesion appeared isointense on T1weighted sagittal (a) and axial (b) images



[Table/Fig-3]: Diffuse homogeneus enhancement of the mass on postgadolinium T1 weighted sagittal (a) and axial (b) images

DISCUSSION

Malign melanoma originating from the mucosa of the nasal cavity and paranasal sinuses is a rare condition that constitute less than 4% of sinonasal neoplasms and approximately only 1% of all malign melanomas [1,2]. The nasal cavity is a more common site than the paranasal sinuses as the developing area for mucosal melanomas [3,4]. Early detection, diagnosis and treatment of malign melanoma is very important for a longer survival time. Often for a sinonasal mass, MR is choosen as the imaging technique. Classic intracranial and intraocular malign melanoma, which is characterized by hyperintensity on T1-weighted (T1W) and hypointensity on T2-weighted (T2W) MR images have been well discussed before [5-10]. However, to our knowledge there are few reports on sinonasal cavity malign melanomas [11-14] and their uncommon type, the amelanotic malign melanoma [15].

The signal intensity characteristics of malign melonoma elsewhere in the body have been well described before [9,10,16,17]. Melanotic melanoma has a high signal intensity on T1W images and a low signal intensity on T2W images due to the paramagnetic property of melanin [17]. It is believed that the paramagnetic property of melanin depends on free radical formation or paramagnetic metals binding to melanin [18,19]. Yousem et al., reported four amelanotic melanomas that showed hypointensity on T1W images and isointensity on T2W images [14]. Kim et al., also reported four cases of amelanotic melanomas that were isointense or hypointense compared with gray matter on T1W images and isointense or hyperintense on T2W images [15]. Similar to these findings, in the resent case, the mass showed low-signal intensity on T1W images, heterogeneous-isointense signal intensity on T2W images and diffuse homogeneous enhancement on postgadolinium T1W images, confirming diagnosis of amelanotic melanomas. Woodruff et al., reported that hemorrhage in a melanoma has a greater influence on signal characteristics than melanin [20]. However, Kim et al., demonstreated three and Yousem et al., demonstreated two hemorrhagic amelanotic melanomas showing iso or low signal intensity on T1W images [15]. It appears that signal intensities on MR are primarily influenced by the amount of melanin and products of hemorrhage partially contribute to these. MR imaging is a superior modality for examination of the extent of tumour, perineural spread, and vascular or subtle intracranial involvement. In our case, expansion of the medial wall of the orbita and nasal septum were identified. Variations in signal intensity also allow for an important differentiation between tumour involvement and obstructive or inflammatory sinus changes.

Most tumours of the sinonasal cavity can present similar findings as an amelanotic malignant melanoma. If the tumour is large enough to transgress the boundaries of the nasal cavity, the differential diagnosis should include squamous cell carcinoma, adenocarcinoma, minor salivary gland malignancies, lymphoma and metastasis. When the tumour is localized in the nasal cavity, the differential diagnosis should include benign lesions such as adenomas, angiomas, fibromas and inverted papillomas. Olfactory neuroblastoma, plasmacytoma and fibro-osseous lesions may also arise in the sinonasal cavity and can have comparable MR imaging characteristics.

Fungal sinusitis consisting of minerals and lymphoma with the presence of high cellularity may appear hypointense on T2W images. Fungal sinusitis is assosiated with underlying immunosuppression and diabetes mellitus. The lesions are frequently infiltrative with heterogeneous enhancement and can cause bony destruction. Lymphoma lesions are usually multicentric and appear hypointense on T1W images. The diagnosis of mucocele is excluded with peripheral enhancement. Metastasis of hemorrhagic tumours and mucinous adenocarcinomas as from a primary colon tumour can show hypointensity on T2 weighted images. In our case, the presence of homogeneous enhancement and absence of primary tumour suggested a diagnosis of primary melanoma. The biopsy revealed amelanotic malign melanoma.

In the sinonasal region, the imaging characteristics of malign tumours are so similar that it is impossible to distinguish the pathology with imaging. If a less aggressive and small mass is localized in the nasal cavity, it can be difficult to differentiate this tumour from other benign lesions. Malign melanoma of the sinonasal cavity has a unique imaging feature for predicting the tumour pathology, thus it may help early detection and evaluating the extent of the disease. In contrast to the classic type of malign melanoma, if the lesion has insufficient melanin, it may be confusing and difficult to diagnose. The main treatment for mucosal malign melanoma is surgical resection. However, the choice of treatment and prognosis basically depends on the spread of the disease and the presence of distant metastasis at time of presentation.

CONCLUSION

Rare primary amelanotic malign melanoma can arise in the sinonasal cavity. MR imaging signal intensities change according to the amount of melanin pigment and its distribution. Contrast MR imaging shows enhancement patterns similar to melanoma elsewhere that may suggest a diagnosis and also helps in further defining the extent of the tumour.

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PARTICULARS OF CONTRIBUTORS:
1. Faculty, Department of Radiology, Ondokuz Mayıs University Hospital, Samsun, Turkey.
2. Faculty, Department of Otolaryngology Head and Neck Surgery, Ondokuz Mayıs University Hospital, Samsun, Turkey.
3. Faculty, Department of Radiology, Gazi Hospital, Samsun, Turkey.
4. Faculty, Department of Radiology, Ondokuz Mayıs University Hospital, Samsun, Turkey.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Hediye Pınar Gunbey,
Department of Radiology, Ondokuz Mayıs University Hospital, Kurupelit, Samsun/Turkey.
E-mail: hpgunbey@hotmail.com

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