ELSEVIER

Canadian Association of Radiologists Journal 63 (2012) 341–343

CANADIAN ASSOCIATION OF RADIOLOGISTS JOURNAL

www.carjonline.org

Canadian Residents' Corner / Coin canadien des résidents en radiologie

Case of the Month #179: Nasal Mucosal Melanotic Melanoma

Philippe Dion-Cloutier, MD[a,*], Olga Gologan, MD[b], Denis Melançon, MD[c], Donatella Tampieri, MD, FRCPC[c]

[a]*Department of Radiology, Université de Montréal, Montreal, Quebec, Canada*
[b]*Department of Pathology, Royal Victoria Hospital, McGill University, Montreal, Quebec, Canada*
[c]*Department of Radiology, Montreal Neurological Hospital and Institute, McGill University, Montreal, Quebec, Canada*

Clinical Presentation

A 70-year-old woman with a history of a mass for which she had a local resection of a single lesion over her nasal septum without additional adjuvant chemotherapy or radiation therapy presented with recurrence of the lesion. She was unable to eat adequately, which led to a weight loss of 15 lb (6.8 kg) in 3 months. Results of a physical examination revealed a huge firm vascular mass coming from the nasal cavity. A head and neck examination revealed no peripheral lymphadenopathy. Computed tomography (CT), magnetic resonance (MR) T1- and T2-weighted images on a 1.5 Tesla scanner, and surgical specimen for pathologic analysis were obtained (Figure 1).

Diagnosis

Nasal mucosal melanotic melanoma.

Radiologic Findings

CT of the sinuses with contrast demonstrated a large mass of the nasal cavity that extended superiorly into the anterior ethmoid air cells and anteriorly through the anterior choana with the presence of a large external component. There was no evidence of erosion of the skull base or extension into the intracranial compartment (Figure 1A). MR imaging showed the mass to be isointense on T1-weighted images (Figure 1B) and slightly hyperintense on T2-weighted images (Figure 1C).

Pathologic Findings

The surgical margins were free of tumour. Immunohistochemical stains revealed that the tumour cells were positive for S-100 and HMB-45 and negative for Melan-A. Hematoxylin and eosin and Fontana stains demonstrated that fewer than 10% of the malignant cells contained melanin pigment (Figure 1D). The concentration of pigment in those positive cells varied from moderate to high. The neoplasm showed abundant necrosis, abundant acute hemorrhage, and minimal amount of hemosiderin.

Discussion

Malignant melanomas arising from the mucosa of the nasal cavity are much rarer than their cutaneous counterpart. Chang et al [1] reviewed 84,836 cases of melanoma of the entire body in which 1.3% were mucosal melanomas. The most common site for mucosal melanomas was the head and neck (55.4%). More specifically, in a series of 259 cases of head and neck mucosal melanoma, the nasal cavity was the most common location of primary tumour, followed by septum, oral cavity, middle turbinate, and inferior turbinate [2]. Melanoma of the skin is strongly related to ultraviolet radiation, whereas mucosal melanoma has no well-established etiologic factor [2]. Melanocytes that migrate as neuroectodermal derivatives may account for the presence of melanoma in the nasal cavity because the epithelium of this location is ectodermally derived [3]. The most common presenting symptoms are epistaxis and nasal obstruction [3,4].

Imaging studies of sinonasal mucosal melanomas tend to show hyperintensity on T1-weighted images as the characteristic of this entity and less frequently hypointensity on T2-weighted images [4,5]. Histopathologic correlations with MR images have been performed and showed melanin to be an

Key Words: Immunohistochemistry; Magnetic resonance imaging; Melanin; Melanoma; Nasal cavity; Nasal mucosa; Paranasal sinus neoplasms.

* Address for correspondence: Philippe Dion-Cloutier, MD, Department of Radiology, Université de Montréal, 2900 Édouard-Montpetit, Montreal, Quebec H3C 3J7, Canada.

E-mail address: philippe.dion-cloutier@umontreal.ca (P. Dion-Cloutier).

doi:10.1016/j.carj.2010.09.005

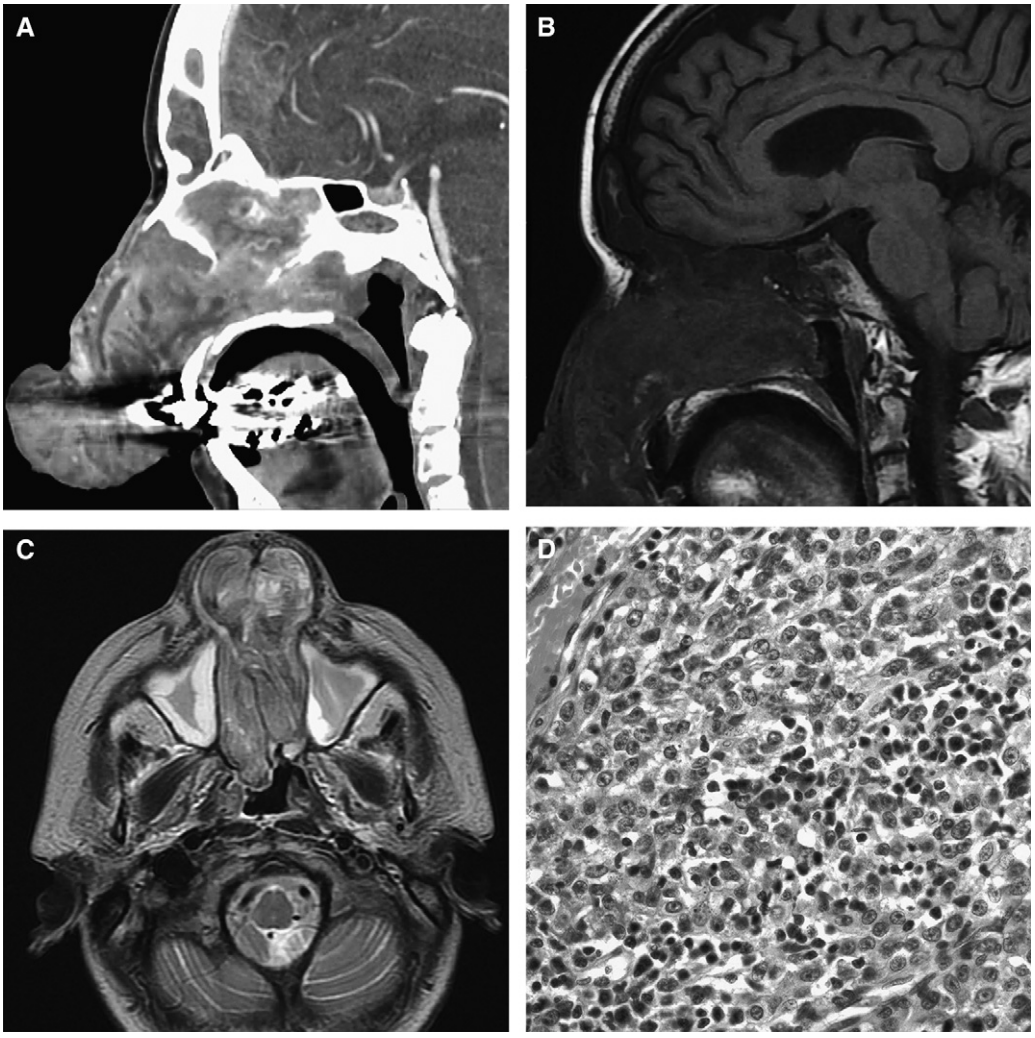

Figure 1. A 70-year-old woman with nasal mucosal melanotic melanoma. (A) Sagittal contrast-enhanced computed tomography of sinuses, demonstrating a large mass that extends superiorly into the anterior ethmoid air cells and anteriorly through the anterior choana, with the presence of a large external component. There is no erosion of the skull base or extension into the intracranial compartment. (B) Sagittal unenhanced magnetic resonance (MR) T1-weighted image (2100/26; TR msec/TE msec), showing the mass to be isointense. (C) Axial unenhanced MR T2-weighted image (5500/87), demonstrating a slightly hyperintense mass. (D) High-power view of the melanoma cells, less than 10% demonstrating melanin pigment. (H & E stain, original magnification, × 400).

important contributor for this pattern. In a series of sinonasal melanoma, nonhemorrhagic melanotic melanomas showed hyperintensity on T1-weighted images [4]. Furthermore, Isiklar et al [6] reported that the percentage of melanin-containing cells correlates with signal intensity and used an iron stain to confirm the absence of hemorrhagic material in questionable cases. Enochs et al [7] demonstrated that this high MR signal intensity is primarily because of bound paramagnetic metal. In contrast, the MR imaging appearance of amelanotic melanomas is nonspecific: iso- or hypointensity on T1-weighted images and iso- or hyperintensity on T2-weighted images [4–6,8,9].

In the case presented here, the low amount of melanin-containing cells might not have been sufficient to produce the characteristic hyperintensity on T1-weighted images. Thus, the differential diagnosis of a nasal cavity mass, isointense on T1-weighted images and iso- or hyperintense on T2-weighted images, includes nasal mucosal melanoma (amelanotic or poorly melanotic). Other lesions to be considered are squamous cell carcinoma, minor salivary gland cancers (including adenoid cystic carcinoma, adenocarcinoma, and undifferentiated carcinoma), inverted papilloma, and olfactory neuroblastoma.

One limitation of the evaluation of a nasal mucosal melanoma is that those lesions may bleed, and, depending on the stage of the hemorrhage, the MR signal intensity is differently affected. Methemoglobin is the paramagnetic substance in acute hemorrhage and might contribute to the characteristic hyperintensity on T1-weighted images of nasal mucosal melanotic melanoma. In the present case, MR imaging showed the mass to be isointense on T1-weighted images, and pathologic analysis demonstrated abundant acute hemorrhage. One possible explanation was that surgery might have produced some hemorrhage. Another possible limitation of our radiologic-pathologic correlation was that the histopathologic slides selected for the pathologic analysis might not truly represent the entire neoplasm.

In conclusion, nasal mucosal melanotic melanoma may or may not show the characteristic hyperintensity on T1-weighted images, depending of the amount of melanin-containing cells. Therefore, one should include this lesion in the differential diagnosis of a nasal cavity mass.

References

[1] Chang AE, Karnell LH, Menck HR. The national cancer data base report on cutaneous and noncutaneous melanoma: a summary of 84,836 cases from the past decade. The American College of Surgeons Commission on Cancer and the American Cancer Society. Cancer 1998;83:1664–78.

[2] Nandapalan V, Roland NJ, Helliwell TR, et al. Mucosal melanoma of the head and neck. Clin Otolalyngol Allied Sci 1998;23:107–16.

[3] Manolidis S, Donald PJ. Malignant mucosal melanoma of the head and neck: review of the literature and report of 14 patients. Cancer 1997;80: 1373–86.

[4] Yousem DM, Li C, Montone KT, et al. Primary malignant melanoma of the sinonasal cavity: MR imaging evaluation. Radiographics 1996;16: 1101–10.

[5] Kim SS, Han MH, Kim JE, et al. Malignant melanoma of the sinonasal cavity: explanation of magnetic resonance signal intensities with histopathologic characteristics. Am J Otoloryngol 2000;21: 366–78.

[6] Isiklar I, Leeds NE, Fuller GN, et al. Intracranial metastatic melanoma: correlation between MR imaging characteristics and melanin content. AJR Am J Roentgenol 1995;165:1503–12.

[7] Enochs WS, Petherick P, Bogdanova A, et al. Paramagnetic metal scavenging by melanin: MR imaging. Radiology 1997;204:417–23.

[8] Crowley JJ, Lupetin AR, Wang SE. Primary nasal amelanotic melanoma: MR appearance. J Magn Reson Imaging 1991;1: 601–4.

[9] Premkumar A, Marincola F, Taubenberger J, et al. Metastatic melanoma: correlation of MRI characteristics and histopathology. J Magn Reson Imaging 1996;6:190–4.