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Clear cell carcinoma of the nasal cavity: A case report from histopathological viewpoint

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ABSTRACT

We report an extremely rare case of primary clear cell carcinoma (CCC), not otherwise specified (NOS) of the nasal cavity. An 80-year-old woman was referred to our hospital with left nasal obstruction caused by a nasal cavity tumor. The tumor was resected completely with lateral rhinotomy approach. Histopathological examination revealed CCC. CCC metastasis from renal cell carcinoma (RCC), which is at the top of differential diagnosis, was ruled out by the absence of renal tumor at computed tomography (CT). Also, immunohistochemical results of the specimen with vimentin negative and CK7 focally positive excluded the possibility of RCC metastasis. The patient is free from recurrence 1 year after the surgery, and there is no evidence of RCC. In this report histopathological characteristics, especially immunohistochemical properties of primary CCC, NOS of the nasal cavity are presented together with some clinical features of this rare tumor. Also, we refer to histopathogenesis of primary CCC of nasal cavity in relation to myoepithelial carcinoma. Histopathological discussion is further extended to include other CCC and CCC-resembling histologies to confirm the uniqueness of the present case.

1. Introduction

Sinonasal cancers, which account for 3% of all head and neck cancers, have their origin in the nasal cavity in 20–30% of cases [1]. Secondary or metastatic tumors to the sinonasal tract are rarely seen constituting only 1.5% of all sinonasal cancers [2]. Renal cell carcinoma (RCC), of which the typical histopathology is "clear cell carcinoma (CCC)", is the most frequent primary tumor metastasizing to the sinonasal tract [3]. While most of the primary sinonasal cancers are of squamous cell carcinoma [4], there are a wide variety of histologies including CCC, not otherwise specified (NOS) which is quite rare with only 12 cases reported in English literature [5–9]. Therefore, in spite of its rarity, when the histopathology of a sinonasal tumor proves to be CCC, it is mandatory to determine the nature of the tumor, i.e. whether it is primary, metastatic or even clear-cell like carcinomas, in order to proceed to the further treatment and make the correct prognosis. Recently we experienced a case of primary CCC, NOS of the nasal cavity, the diagnosis of which was established by in-depth examinations of immunohistochemistry and electron microscopy. In this report, the results of those examinations together with interesting radiological findings are presented. We further deepened the discussion on histopathological characteristics of clear-cell type cancers in the head and neck region.

2. Case report

An 80-year-old woman was referred to our hospital for further diagnosis and treatment of her right nasal cavity tumor. She had been suffering from right nasal obstruction for 4 months and purulent nasal discharge for 2 months. At inspection a tumor with a reddish white tint was seen filling the right nasal cavity (Fig. 1a). Computed tomography (CT) (Fig. 1b) and magnetic resonance imaging (MRI) (Fig. 1c and d) demonstrated a tumor, measuring 57 mm in diameter, occupying the nasal cavity and extending posteriorly to the choana. On contrast study, the mass only minimally enhanced without conspicuous vessels, which made a good contrast to RCC metastasis [10]. Inflammatory changes were observed in the right maxillary sinus due to obstruction of the osteomeatal complex. No infiltration into the ethmoid sinus or

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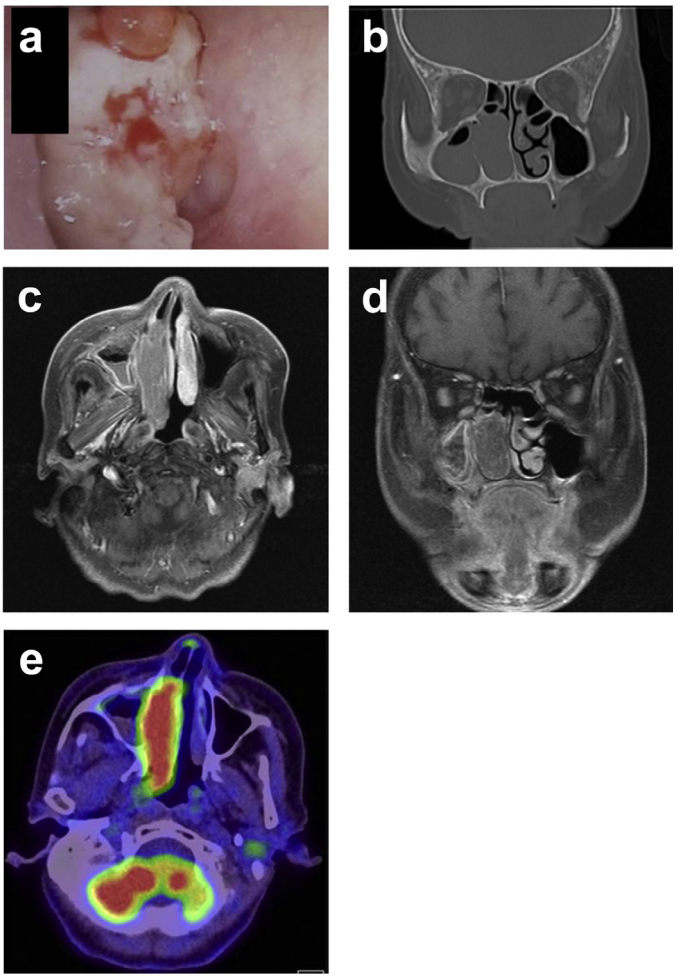

Fig. 1. (a) The tumor with a reddish white tint filling the right nasal cavity. (b) CT image of the coronal section. The lateral wall of the nasal cavity is bowed laterally by the tumor. Enhanced MRI images of axial section (c) and coronal section (d). The tumor with only minimal contract enhancement, measuring 57 mm in diameter, occupies the nasal cavity and extends posteriorly to the choana. (e) FDG-PET examination. FDG uptake was significantly high in this tumor (SUV max 17.02). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of the article.)

destruction of the orbital walls was observed. The lateral wall of the nasal cavity was bowed laterally by the tumor, but no direct invasion of the wall was seen. Her past history consisted of myocardial infarction and gastric cancer which was subtotally resected 24 years previously. A biopsy of the tumor had been performed by the referring doctor which gave the diagnosis of "nasal cavity cancer with histopathological similarity to RCC". FDG-PET revealed a significant uptake by this tumor (Fig. 1e). Regional metastasis, distant metastasis, and other primary tumorous lesions were not demonstrated at CT, MRI, or FDG-PET. In order to rule out a metastatic lesion from RCC, an abdominal CT with dynamic contrast study was conducted. However we could not find any possible lesions in the bilateral kidneys. Furthermore, upper gastrointestinal endoscopy denied gastric cancer.

With a diagnosis of nasal cavity cancer of T1N0, surgical resection was performed with lateral rhinotomy approach. Negative surgical margins and no infiltration to the ethmoid sinus were confirmed at the postoperative pathological examination, and the patient is free from recurrence 1 year after the surgery. The result of histopathological examination was CCC with the similarity to RCC on the H&E stain sections. Relatively small clear cells were seen proliferating as sheets of cells and not forming glandular structures (Fig. 2). Further investigation exploiting immunohistochemical examination was undertaken to definitely differentiate the present case from RCC metastasis. In RCC, CK7 and CK10 are generally negative, vimentin, and CD10 are usually positive [5,11,12]. These and additional markers in our case were as follows (Table 1): CK7 focally positive, CK10, vimentin, and CD10 negative, epithelial membrane antigen (EMA) positive, HMB45 negative, S-100 protein negative, PAS negative. All of these results pathologically favored primary CCC over CCC metastasis from RCC, and there has been no evidence of RCC during the observation period.

The results of other immunohistochemical examinations of this tumor (Table 1) were slightly positive for smooth muscle actin (SMA) and diffusely positive for p63 and CK5/6. Since myoepithelial carcinoma (MC) is known to have these immunohistochemical properties as well, and under microscopy, appears as CCC, we proceeded to look into the histopathogenesis of our present case under electron microscopy using paraffin-embedded section. In our case, desmosomes of the tumor developed well (Fig. 3), which is often not the case with MC. This fact, bolstered by the aforementioned immunohistochemical results (EMA positive, S-100 protein negative, vimentin negative), led us to conclude that the present tumor originated from intercalated duct cells rather than myoepithelial cells.

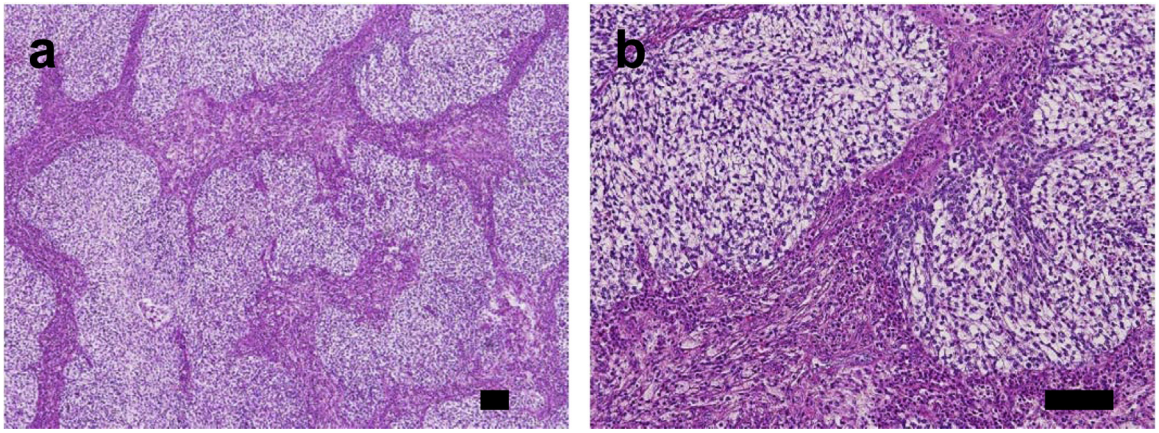

Fig. 2. Histopathological findings of the tumor on the H&E stain sections (a and b). Relatively small clear cells are seen proliferating as sheets of cells and not forming glandular structures. Scale bar: 100 μm.

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