

Multifocal Adenomatous Oncocytic Hyperplasia of the Parotid Gland

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Key Words

Multifocal adenomatous oncocytic hyperplasia · Parotid gland · Oncocytes · Cytology · Histology

Abstract

Multifocal adenomatous oncocytic hyperplasia (MAOH) is a non-neoplastic lesion that is classified as oncocytosis. MAOH is a rare entity of the parotid gland and accounts for approximately 0.1% of salivary gland lesions. Here, we report a case of MAOH of the parotid gland. The patient was a 71-year-old woman who presented with discomfort at the left side of her neck. Fine-needle aspiration cytology of the parotid gland revealed a loose sheet-like cluster of round to polygonal cells with granular cytoplasm against a hemorrhagic background. The cells had round to oval, centrally located nuclei with granular chromatin and without distinct nucleoli. Histologically, the lesion was formed of many variable-sized nodules, comprising oncocyte-like cells with small round nuclei and eosinophilic granular cytoplasm that was positive for mitochondrial antibodies. The diagnosis of MAOH is difficult to make by cytology alone, because the findings overlap with those of other oncocytic lesions. In particular, the cytological findings of MAOH have not been sufficiently reported to date. A correlation of cytology and histology was expected.

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Introduction

Oncocytes are observed in lesions of several organs such as the thyroid, kidney, pancreas, ovary, liver, and salivary gland [1]. In the salivary glands, oncocytes are known to arise in Warthin tumor, oncocytoma, oncocytic carcinoma, and oncocytosis. Oncocytosis is a rare non-neoplastic lesion that is classified as diffuse oncocytosis and multifocal adenomatous oncocytic hyperplasia (MAOH) [2]; it comprises approximately 0.1% of salivary gland lesions [3, 4]. The correct cytological diagnosis of oncocytosis can be difficult because oncocytes are seen in a variety of other salivary gland lesions, and it is usually diagnosed by histological examination [5–8]. Here, we report a case of MAOH of the parotid gland.

Case Presentation

The patient was a 71-year-old woman with no clinical history. She consulted an otolaryngology clinic because of discomfort at the left side of her neck. At the clinic, a mass was noted in the left side of her neck and she was referred to our hospital. A 1.5-cm mass with no lymph node swelling was identified using magnetic resonance imaging. From the above clinical findings, Warthin tumor or a malignant parotid tumor was suspected. Fine-needle aspiration and parotid gland tumor enucleation were subsequently performed. There were no abnormal findings in pre- or postoperative blood samples. Her course was uneventful 25 months after the operation.

Cytological Findings

Five slides were prepared for cytological evaluation, including 3 fixed smears for Papanicolaou staining, 1 air-dried smear for May-Grünwald Giemsa (MGG) staining, and 1 smear examined by liquid-based cytology (LBC) based on the LBC technique. Papanicolaou staining of direct smears revealed a loose sheet-like cluster formed of round to polygonal cells with granular cytoplasm against a hemorrhagic background. The cells had round to oval, centrally located nuclei with granular chromatin and without distinct nucleoli. There was a slight irregularity of the nuclear margin (fig. 1a). In the LBC preparation, the cytoplasm showed microvacuoles in contrast to the direct smear (fig. 1b). Similar findings were observed by MGG staining (fig. 1c). There were only a few lymphocytes, and basophils were not detected in any of the smears. Mitotic findings were not detected either.

Histological Findings

The cut surface of the resected lesion revealed a milky-white lobular mass with an unclear border (fig. 2a). Microscopically, the lesion was formed of many variable-sized nodules that comprised oncocyte-like cells with small round nuclei and eosinophilic granular cytoplasm. A definite capsule was not seen around the nodules and the surrounding adipose tissue and acinus. Cells with atypical mitotic findings suggestive of malignancy were not seen (fig. 2b, c). The Ki-67 labeling index was low. The oncocyte-like cells were diffusely positive for cytokeratin antibodies and strongly positive for mitochondrial antibodies (fig. 2d). Basophils were not detected in the lesion, using immunohistological staining based on anti-CD117 (c-Kit) antibodies. p63-positive cells appeared around the rim of the nodules (fig. 2e),

and the tubular structure in the nodules was emphasized. Typical findings for low-grade cancer of the salivary glands were not observed. From the above findings, we made a diagnosis of MAOH.

Discussion

It has been reported that MAOH develops in women in their 60s and is localized unilaterally in the parotid glands. Bilateral MAOH is uncommon. Histologically, MAOH is thought to arise from the ductal epithelium and the remnants of the original salivary gland [2]. The granular cytoplasm of oncocytes includes abundant mitochondria [9]. In the present case, the lesion was observed unilaterally in the left parotid gland in a 71-year-old woman. The remnants of the existing salivary ducts were observed by p63 and CK34βE12 staining, and a strong response to mitochondrial antibodies was found in the cytoplasm. From the above findings, we were able to make a diagnosis of MAOH.

Most cytological findings of MAOH are not reported. Goyal et al. [6] described the cytological findings of MAOH in a case report: (1) a low N/C ratio; (2) central round nuclei; (3) anisonucleosis; (4) prominent nucleoli (in part of the cells), and (5) abundant eosinophilic cytoplasm. In the present case, the tumor had similar findings to those of Goyal et al. [6]. However, we could not make a diagnosis of MAOH cytologically because of the high N/C ratio and because the nucleoli were unclear.

Cytologically, the major lesions in which oncocytes are observed include Warthin tumor, oncocytoma, and oncocytic carcinoma. Typical cytological findings of Warthin tumor reveal oncocytes and lymphocytes with an inflammatory or necrotic background [5]. In addition, it is known that basophils are associated with Warthin tumor [10]. Bottles et al. [10] have reported that mast cells are present with oncocytes in fine-needle aspiration preparations. They suggested that their findings should be considered as diagnostic evidence of Warthin tumor. Kobayashi et al. [11] have investigated the frequency of mast cells in cytological samples, as compared with immunocytochemical identification using human mast cell tryptase antibodies in Warthin tumor, and have indicated that mast cells are frequent in the epithelial cell component. In contrast, there are no reports to suggest any association with mast cells of other lesions. We also searched for mast cells by cytological MGG staining and immunohistochemical staining using the CD117 (c-Kit) antibody. However, we were not able to detect any mast cells. The identification of basophils seems to be a diagnostic checkpoint when differentiation from Warthin tumor is necessary. However, the typical cytological findings such as a lymphocyte and/or basophil appearance were not observed in any of the cases, which may thus be mistakenly diagnosed as oncocytoma [5] or MAOH. Cytological features of oncocytoma comprise large, round to polygonal cells with abundant granular cytoplasm, centrally located nuclei, prominent nucleoli, binucleation, sheet-like clustering, and an often necrotic background [12]. In oncocytic carcinoma, although the neoplastic cells are pleomorphic, with nuclear atypia and hyperchromatism, other findings overlap with oncocytoma [7, 8, 13]. Thus, it can be difficult to differentiate between MAOH, Warthin tumor, and oncocytoma. In addition, a case of oncocytoma arising from MAOH has been reported [14]. However, the distinction between MAOH and oncocytoma is possible by capsular interpretation. Therefore, it should be noted that neoplastic identification cannot be achieved from partial samples microscopically. Furthermore, oncocytic metaplasia has recently been shown in other salivary gland lesions (e.g., pleomorphic adenoma, myoepithelioma, and mucoepithelial carcinoma), except for MAOH, Warthin tumor, and oncocytic tumor [15]. Therefore, it is necessary to carefully carry out the assessment of oncocytes.

When oncocytes are observed, it is necessary to perform a surgical resection. Furthermore, a correlation of cytological and histological findings is expected in the future.

Disclosure Statement

The authors have no potential conflicts of interest with respect to the authorship and/or publication of this article.

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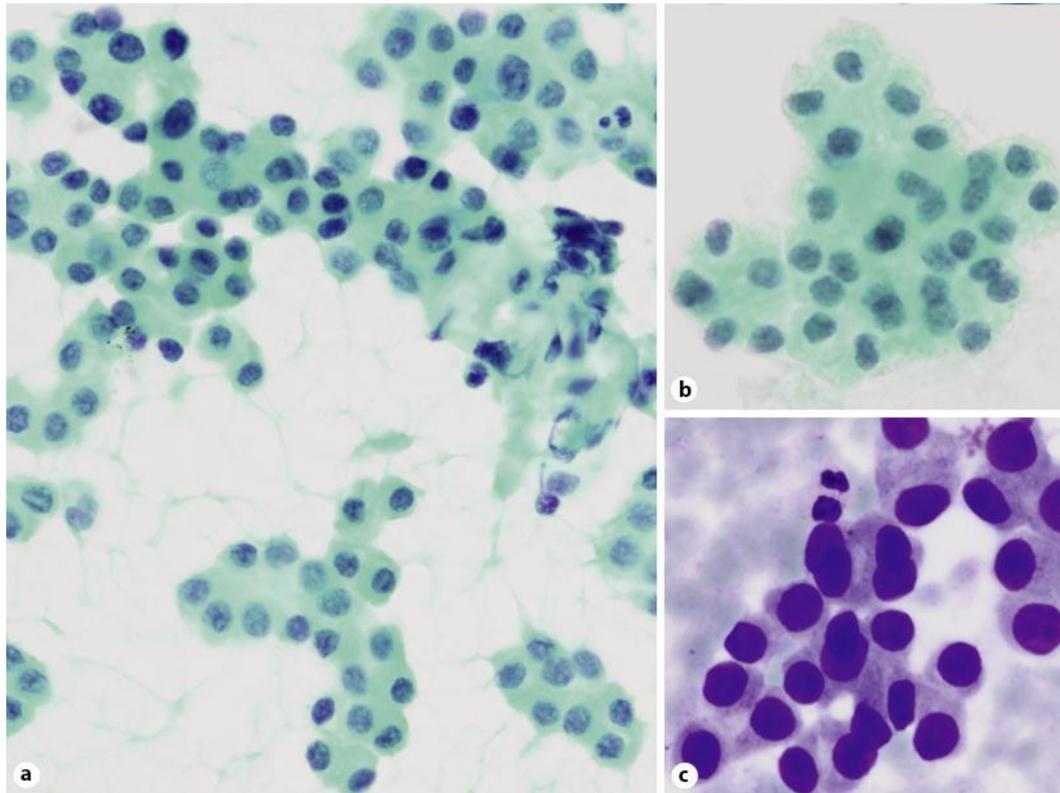


Fig. 1. Fine-needle aspiration findings. **a** Direct preparation of smear findings. Polygonal cells with abundant granular cytoplasm were seen. **b** LBC preparation findings. The cytoplasm showed small vacuoles compared with the cells that underwent direct preparation. Papanicolaou staining. $\times 400$. **c** Granules were observed clearly by Papanicolaou staining. MGG staining. $\times 400$.

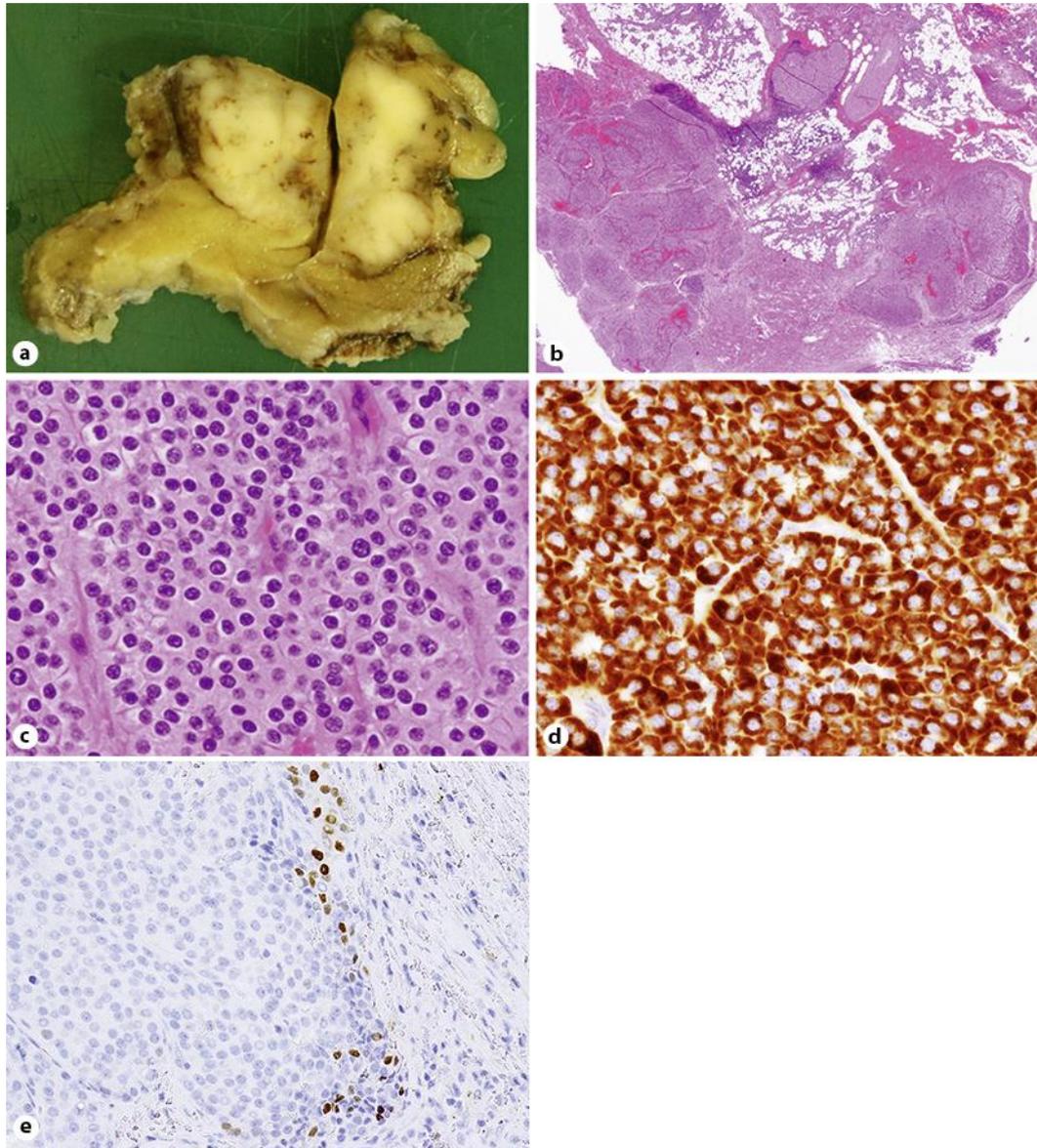


Fig. 2. **a** The cut surface of the resected lesion revealed a milky-white lobular mass with an unclear border. Histological findings of the parotid lesion. **b** Many variable-sized nodules were observed. H&E staining, $\times 100$. **c** The lesion comprised oncocyte-like cells with granular cytoplasm. H&E staining, $\times 400$. **d** Cells were strongly positive for mitochondrial antibodies. Immunohistochemical staining, $\times 400$. **e** p63-positive cells appeared around the rim of the nodules. The findings suggest a transition from existing tissue. Immunohistochemical staining, $\times 400$.