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## Case Report

# Parotid oncocytoma: CT and pathologic correlation of a rare benign parotid tumor

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## ABSTRACT

Oncocytoma, also known as oxyphilic adenoma or mitochondrioma of the parotid gland is a rare benign tumor constituting less than 1.5% of all parotid lesions. As there are no characteristic imaging findings, this lesion often poses a diagnostic and clinical challenge. We present a rare case of a parotid oncocytoma posing a diagnostic challenge in a 55-year-old woman presenting with a facial mass. We hope to bring awareness of this benign entity affecting the parotid gland.

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## Introduction

Oncocytoma of the parotid gland is a rare benign tumor that presents a diagnostic challenge to clinicians. Salivary gland tumors comprise only 3% of all head and neck lesions, and oncocytomas represent 0.1%–1.5% of these cases. The vast majority of salivary gland oncocytomas occur in the parotid gland. These tumors typically affect individuals between their sixth to eighth decade. Although there is no strong sex predilection, it is reported that women in their seventh or eighth decade may be more commonly affected [1–3]. A history of radiation exposure 5 or more years prior to presentation has been noted in 20% of cases [4].

Parotid oncocytomas most commonly present as a solitary mass with the clinical complaint of swelling for weeks to years. They are typically painless and mobile [1,5–7]. We present a case of parotid oncocytoma describing the histologic and radiologic findings that led to the diagnosis, emphasizing the rarity of this disease to bring awareness of the benign diagnosis.

## Case report

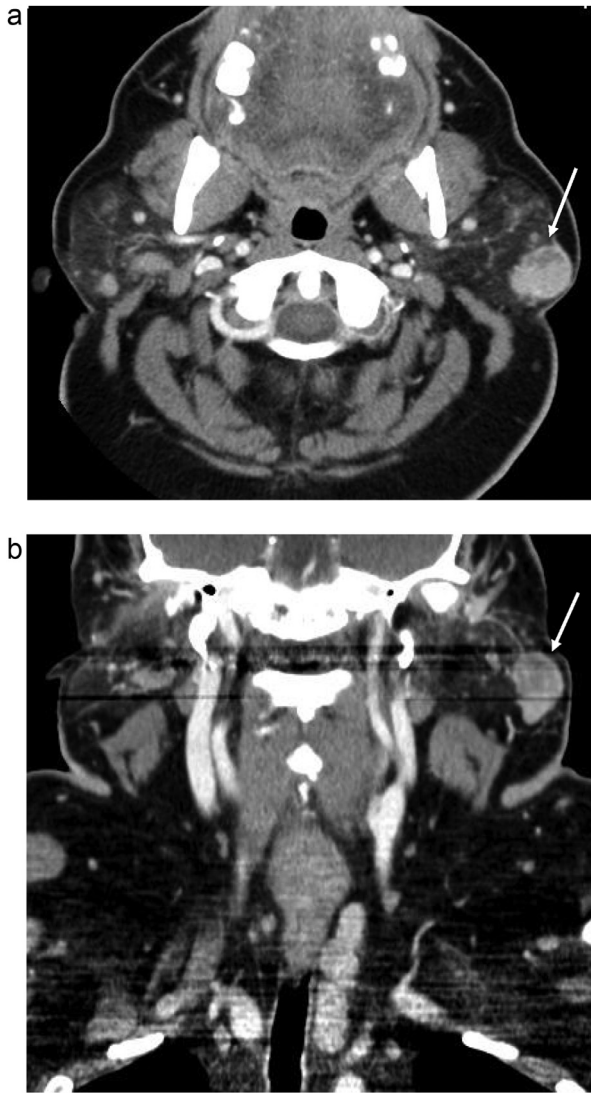
A 55-year-old woman presented to our institution's otolaryngology clinic with the chief complaint of a left sided facial

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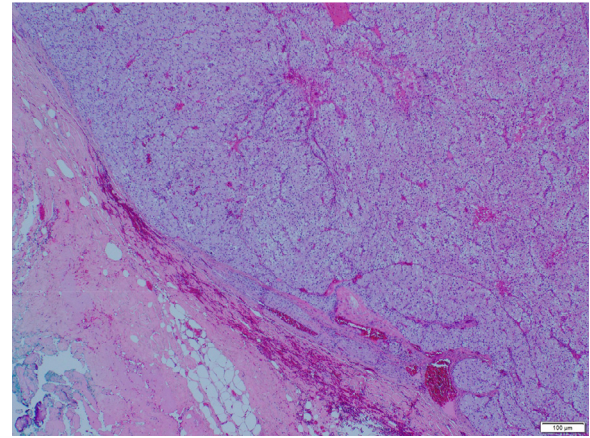


**Fig. 1 – (a) Axial contrast enhanced CT of the parotid gland demonstrates a heterogeneous enhancing mass in the superficial lobe with a low attenuation focus anteriorly. (b) Coronal contrast enhanced CT of the parotid gland demonstrates a heterogeneous enhancing mass in the superficial lobe with a low attenuation focus**

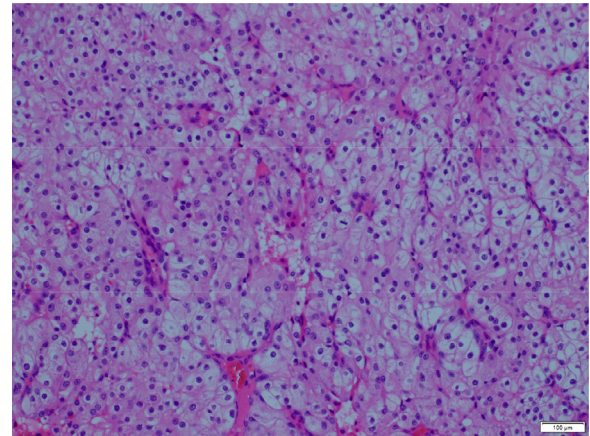
mass. She was referred by her primary care provider with a diagnosis of epidermal inclusion cyst. The patient reported the mass had been present for 4 months and was increasing in size.

On physical exam, the patient was found to have a soft left sided inferior auricular facial mass, measuring approximately 2 centimeters. Mild tenderness upon palpation of the mass was noted. Otherwise, no additional masses were appreciated and there was no palpable lymphadenopathy. A fine needle aspiration of the mass conducted during that clinical visit exhibited a vascular oncocytic neoplasm.

A CT examination of the neck with contrast was performed to further characterize the facial mass. A 1.9 × 2.1 × 1.8 cm circumscribed lesion in the superficial lobe of the left parotid



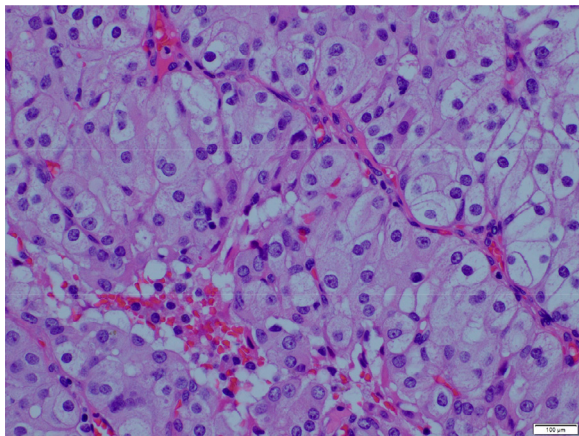
**Fig. 2 – Low power view of the specimen demonstrates a solid mass with lobular border, increased vascularity and typical oncocytic cells along with large group of cells with clear cytoplasm**



**Fig. 3 – Medium power view of the specimen shows areas of typical oncocytes with eosinophilic granular cytoplasm along with similar cells with clear cytoplasm**

gland was described, demonstrating heterogeneous enhancement with a hypodense region along the anterior-superior portion [Figs. 1a and b]. It was unclear whether this lesion represented a primary salivary gland neoplasm or a metastatic lesion. Based on the FNA findings, the differential diagnosis included parotid oncocytoma, metastatic renal cell carcinoma and oncocytic papillary cystadenoma. Due to the concern for possible metastatic renal cell carcinoma on histology, a CT examination of the chest, abdomen, and pelvis was performed. No definitive radiographic findings of malignancy were identified. Specifically, the kidneys were unremarkable.

An excisional superficial parotidectomy was performed for final diagnosis in which the specimen demonstrated a cellular neoplasm with lobulated border composed of 2 type of cells, typical oncocytes with granular orange-pink cytoplasm and cells with clear cytoplasm with round nuclei and prominent nucleoli, consistent with oncocytoma, clear cell type [Figs. 2-4]. Immunohistochemical staining with P63, RCC,



**Fig. 4 – High power view of the specimen reveals polygonal cells with clear and eosinophilic granular cytoplasm with large, single, round nuclei with prominent nucleoli, consistent with oncocytoma, clear cell type**

PAX8, Thyroglobulin, TTF-1 ruled out the main differential diagnosis of metastatic renal cell carcinoma and oncocytic papillary cystadenoma.

## Discussion

Parotid oncocytomas present a diagnostic challenge to clinicians by virtue of their extremely low prevalence. Currently, the histological and radiological findings of these rare tumors have been documented in the literature largely in the form of case reports and case series.

The term oncocyte refers to mitochondria-rich cells that have highly eosinophilic granular cytoplasm, and round, centrally located, single nucleus, pleomorphic in size, with smooth nuclear border, low nuclear to cytoplasmic ratio, and prominent single macronucleolus. The cytoplasm of these so-called oncocytes has historically been described as swollen and consists of acidophilic granules. Cytology demonstrates sheets of oncocytes devoid of lymphoid cells compared to the Warthin tumors, which besides sheets of oncocytes, also contain numerous lymphocytes in their background [7–10]. Given the characteristic hyperplasia of mitochondria in oncocytes, it is thought that mitochondrial dysfunction or defective cellular metabolism may be present in these cells. Based on the studies of Capone and Shellenberger et al., more than one oncocytic variant can exist in a single parotid gland, lending credibility to the possibility of a common mitochondrial defect that promotes a step-by-step advancement through the variants [8,11]. Other proposed explanations for oncocytic change consider it a metaplastic change or a product of aging [12]. The underlying cause of oncocytomas is yet unknown, but there may be an association with radiation exposure [9].

Reported sensitivity of fine needle aspiration in detecting oncocytic neoplasia is only 29% [8]. The rarity of oncocytomas can be partially implicated in this. Of note, exceedingly sparse cases of coexisting Warthin's tumor and oncocytoma have been documented in the literature. In these settings, the

histopathological differentiation of the 2 tumors has posed a diagnostic challenge, as both comprise cell types rich in mitochondria [13]. MRI and CT are the preferred radiological modalities in evaluation of parotid tumors [14]. Parotid oncocytomas are described as well-defined masses with heterogeneous enhancement, which may lead to diagnostic possibilities of Warthin's tumor, pleomorphic adenoma and other low-grade malignancies given this anatomical vicinity [2]. MR findings are variable; although, the most common reported MR findings of parotid oncocytoma have been described as hypointense signal intensity on T1 weighted imaging becoming isointense to the parotid on T2 weighted and post contrast fat suppressed T1 weighted images [15]. In rare cases where Warthin's tumor and oncocytoma coexist, one study notes that neither CT nor MRI can distinguish between the tumors [13]. Meanwhile, another study suggests that certain MR features can potentially help distinguish these 2 entities when they occur independently. Specifically, it found that Warthin's tumors have higher signal intensity ratio on T2 weighted imaging and diffusion weighted imaging with lower ADC values compared to oncocytomas [4]. If PET imaging is performed, oncocytomas demonstrate intense FDG avidity [16,17]. The variability of radiologic findings amongst these case studies highlights the diagnostic challenges of this rare parotid tumor.

Management of parotid oncocytoma involves either radical or superficial total parotidectomy based on imaging findings. There may be a role for radiotherapy in some situations, but it is typically not curative. There is currently insufficient evidence surrounding the use of chemotherapy. Recurrence after surgery can be seen in 20%-30% of patients in the setting of residual tumor or nodularity, but malignant transformation is reportedly low likelihood. MRI after 1 and 2 years is recommended to monitor for recurrence [1].

## Conclusion

Oncocytoma of the parotid gland is a rare benign tumor that presents a diagnostic challenge for clinicians due to its low prevalence. To date, much of the literature comprises case studies and case series of the tumor without definitive consensus of diagnostic radiological findings. Given the imaging findings of this process are nonspecific, we hope to bring awareness of this disease and classification as a benign neoplasm.

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