

## Secretory carcinoma

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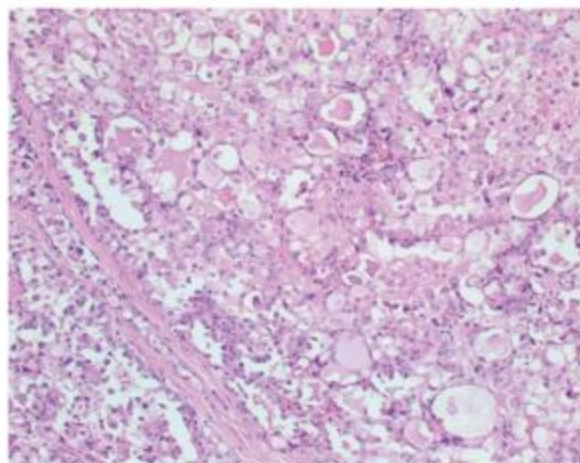


Figure 1. An intermediate-power view shows a cellular tumor with a solid to glandular appearance, with eosinophilic secretions within the lumen. The cytoplasm is eosinophilic to bubbly.

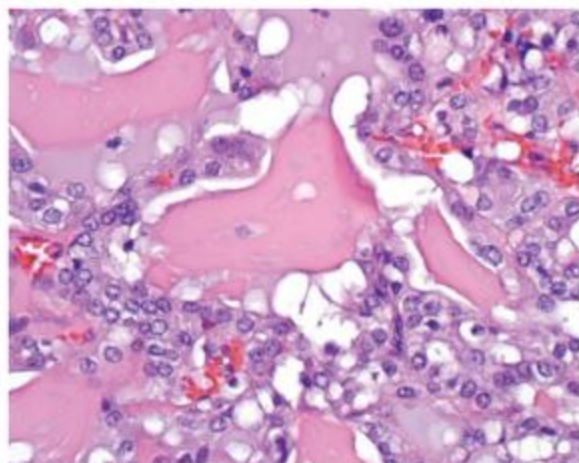


Figure 2. A high-power view demonstrates the open to vesicular nuclear chromatin with very small nucleoli. There is "colloid-like" material in the lumen, with scalloping artifacts.

Secretory carcinoma, first described as *mammary analogue secretory carcinoma* (MASC), is a recently described, distinctive malignant salivary gland tumor that is quite similar to secretory breast carcinoma, defined by the t(12;15)(p13;q25) translocation resulting in an *ETV6-NTRK3* fusion product. The vast majority of these tumors used to be included in the acinic cell carcinoma category.

The tumor is considered uncommon, but as it is recently recognized, it may be under-reported or under-recognized at present. There is a slight male-to-female predominance (1.3:1), with a wide age range at presentation (7 to 88 years; mean 47 years). The majority (65%) develop in the parotid gland, with the submandibular gland and buccal mucosa less frequently affected.

Patients present with a slowly growing, painless mass. Metastatic disease to neck lymph nodes may be seen in as many as 30% of patients at presentation.

While complete surgical excision with neck dissection for clinically detected metastases is employed, as many as 10% of cases may show high-grade transformation, which requires additional radio- or chemoradiotherapy. Tyrosine kinase inhibitors may be employed (used for *ETV6-NTRK3*-positive leukemias). Overall, the prognosis is still good.

The average tumor is about 2 cm, presenting as a solitary, circumscribed but not encapsulated mass, although it may have invasive borders. Intratumoral sclerosis and a tumor-associated lymphoid proliferation are common. Perineural (~25%) and lymphovascular (~15%) invasion may be seen.

The tumor is arranged in a variety of different patterns, including microcystic, papillary, tubular, and solid, formed around cysts or glands (figure 1). There are abundant, bubbly to homogenous eosinophilic secretions, giving a thyroid "colloid-like" appearance. The nuclei are bland, with vesicular nuclear chroma-

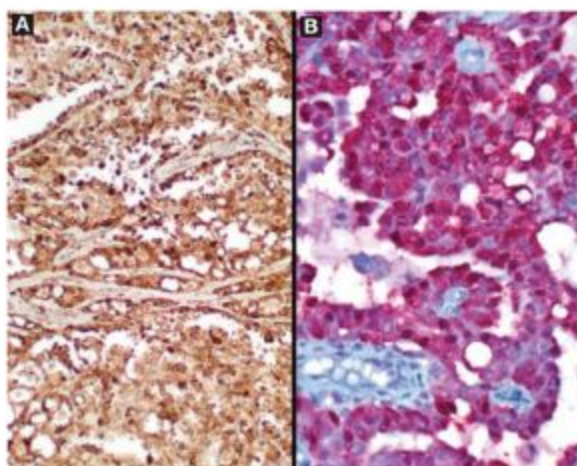


Figure 3. Immunohistochemistry studies help to confirm the diagnosis, including mammaglobin (left) and S-100 protein (right), among others.

tin with small nucleoli. The cytoplasm may be pink, granular, or vacuolated but lacking secretory zymogen granules (figure 2).

Mitoses are usually limited, but when they are increased, high-grade transformation must be excluded. The neoplastic cells are positive for mammaglobin, S-100 protein (figure 3), and GCDFP-15; they occasionally show focal basal staining for p63, but DOG1 is negative.

The tumor was originally defined by the recurrent balanced  $t(12;15)(p13;q25)$  chromosomal translocation resulting in *ETV6-NTRK3* fusion product, which is detected by a FISH break-apart probe for *ETV6*. As many of these tumors were originally classified as acinic cell carcinoma, that is the most common differential diagnostic consideration, but polymorphous low-grade adenocarcinoma, papillary cystadenocarcinoma, mucoepidermoid carcinoma, and low-grade intraductal carcinoma are the most common other considerations.

### Suggested reading

- Bishop JA. Unmasking MASC: Bringing to light the unique morphologic, immunohistochemical and genetic features of the newly recognized mammary analogue secretory carcinoma of salivary glands. *Head Neck Pathol* 2013;7(1):35-9.
- Skalova A. Mammary analogue secretory carcinoma of salivary gland origin: An update and expanded morphologic and immunohistochemical spectrum of recently described entity. *Head Neck Pathol* 2013;7 Suppl 1:S30-6.

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revealed that it was consistent with an aspergilloma, or fungus ball.

Postsurgically, antibiotics and a topical steroid were prescribed for 3 and 6 weeks, respectively. Nasal saline irrigation was recommended twice a day for 3 weeks. The postoperative course was uneventful, and the patient experienced no further symptoms.

Fungal sinusitis can be classified as either invasive or noninvasive. Fungus balls, such as the one that presented in this case, are the most common form of fungal sinusitis. The maxillary sinus, followed by the ethmoid and sphenoid sinuses, is the site where fungus balls most commonly grow.<sup>1</sup> The "gold standard" for complete removal of fungus balls is endoscopic sinus surgery.

The ANC is an important structure that affects frontal recess anatomy.<sup>2</sup> It is part of the anterior ethmoid sinus and can be seen on coronal CT scans of the sinus in views anterior to the middle turbinates.<sup>3</sup> The drainage pathway of the ANC is usually in the posterior midportion, and it generally terminates in the superior middle meatus.<sup>4</sup> The frontal recess is situated behind the posteromedial wall of the ANC. The reported prevalence of the ANC in patients shows great variability; reported rates range between 40 and 100%.<sup>2</sup>

The presence and degree of pneumatization of the ANC affects the anteroposterior dimension of the frontal sinus ostium, the size of the frontal beak, and the pattern of drainage.<sup>5</sup> The case described in this article involved a fungus ball in the ANC, which is a rare occurrence. While the pathogenesis was unclear, a possible cause for the fungus ball might have been an issue with the drainage pathway due to middle meatal obstruction.

### References

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- Wormald PJ. The agger nasi cell: The key to understanding the anatomy of the frontal recess. *Otolaryngol Head Neck Surg* 2003;129(5):497-507.