**Clinical history**

A 53-year-old caucasian male patient presents with symptoms of chronic nasal obstruction, hyposmia and maxillary tenderness for 6 months. Laboratory findings were negative. All allergy tests remained negative. Clinical examination revealed nasal congestion of the right nasal cavity. CT scan (Fig. 1) as well as unenhanced and Gadolinium-enhanced MRI (Fig. 2 and 3 respectively) of the paranasal sinuses were carried out.

**Imaging findings**

Figure 1: CT scan of the paranasal sinuses.
Fig. 1a: Axial images.
Fig. 1b: Reformatted images in the coronal plane.
A mass in the right nasal cavity with the epicenter at the right maxillary ostium is seen. The mass expands into the right nose cavity causing thinning of the right nasal conchae and significant mass effect. Lateral expansion with thinning, scalloping and deformation of the bony wall of the right maxillary sinus. Cranial expansion into the right anterior ethmoidal cells.

Figure 2: Unenhanced MRI of the paranasal sinuses.
Fig. 2a: Axial T1-weighted image.
Nearly homogeneous mass, iso-intense to normal mucosa is seen at the right maxillary sinus.
Fig. 2b: Coronal T2-weighted image.
On this sequence, the mass at the right maxillary sinus reveals a pronounced inhomogeneous, hyperintense aspect, composed by curvilinear striations and areas of less compacted cells.

Figure 3: Gadolinium-enhanced MRI of the paranasal sinuses.
Fig. 3a: Axial Gd-T1-weighted image.
Fig. 3b: Coronal Gd-T1-weighted image.
Inhomogeneous enhancement by the mass is seen.

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Based on the clinical information and imaging findings the diagnosis of **inverted papilloma** was made. Histological research after functional endoscopic sinus surgery (FESS) confirmed the diagnosis of a Schneiderian papilloma.

**Comment**

Inverted papilloma (IP), a subtype of Schneiderian papilloma, is a benign epithelial tumor of nasal mucosa with histology showing epithelium proliferating into the underlying stroma. It is usually centered at the middle meatus along the lateral nasal wall although they are seen elsewhere in the nasal passage. The tumoral mass causes local bone remodeling and spreads into the adjacent sinuses (maxillary > ethmoidal > sphenoidal > frontal).

IP only accounts for approximately 0.5–4.0% of primary sinonasal tumors. They do typically occur in 40 to 70 years old men who present with a history of recurrent sinusitis, nasal obstruction, epistaxis, anosmia and headache.

On CT scan focal hyperostosis of the adjacent bone may indicate the point of tumor attachment. For further differentiation and pre-operative planning MRI is necessary. MRI usually shows iso- to slightly hyperintense signal on T1-weighted images, heterogeneous and predominantly hyperintense on T2-weighted images, with typical curvilinear striations, often described as "convoluted, cerebriform pattern". T1-contrast-enhanced images may show the same curvilinear striations.

PET scan is not a reliable examination technique to distinguish benign inverted papilloma and spinocellular carcinoma.

Top differential diagnoses of IP are solitary sinonasal polyps (which shows peripheral, not central enhancement), sinonasal squamous cell carcinoma (which destroys bone, rather than remodels) and sinonasal polyposis (present as polypoid lesions).

Treatment consists of endoscopic resection of the tumoral mass including the attachment point, usually at the medial maxillary wall. In some cases, like in the presented case, partial resection of the middle concha is necessary.

IP’s have potential for both recurrence (in case of incomplete local resection) and malignant transformation.

**Key words**

Inverted papilloma – Schneiderian, sinonasal neoplasm – paranasal sinuses CT, MRI

**References**


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