Schneiderian papilloma of the sinonasal tract.

by Lester D. R. Thompson, MD

The sinonasal tract, lined by ciliated respiratory mucosa (Schneiderian epithelium), gives rise to three distinct papilloma morphologies. Collectively, these lesions are referred to as *Schneiderian papillomas* and include *inverted* (~50%), *exophytic* (~47%), and *oncocytic* (~3%) types. The tumors are uncommon, with an incidence of about 2.3 cases per 100,000 population. The lesions develop over a broad age range but peak in the fifth decade, with males affected more often than females (3:1). Malignant transformation develops in about 2% of Schneiderian papillomas.

There is a strong etiologic association with human papillomavirus (HPV), most often with serovars 6 and 11, although this association has not been identified in the oncocytic type. Other diseases, such as inflammatory polyps and allergic fungal sinusitis, may be seen concurrently.

The overall clinical presentation is quite nonspecific, with nasal obstruction, polyps, headache, epistaxis, and rhinorrhea the most common symptoms. There is a distinct difference in anatomic sites of involvement: Inverted and oncocytic papillomas affect the lateral nasal cavity and paranasal sinuses (ethmoid, maxillary, and frontal) (>90%), while the exophytic type tends to affect the nasal septum (>90%).

Bilateral lesions are infrequent (about 10%); other sites are rarely affected (nasopharynx, lacrimal sac, eustachian tube, and middle ear). Exophytic lesions are nearly always solitary and tend to show an even more pronounced male predilection (male-to-female, 10:1).

Imaging findings tend to be nonspecific, with opacification of the cavities by a soft-tissue density or mucosal thickening. If there is extensive bone destruction (not just remodeling), malignant transformation should be excluded.

Complete surgical removal at first surgery is the treatment of choice, as persistence and/or recurrence is frequent with incomplete resection (about 20%). Transnasal endoscopic techniques achieve similar results to those of open procedures, as long as adjacent uninvolved epithelium is included. Radiation is employed for patients with advanced or incompletely resected tumors and for patients who develop carcinoma.

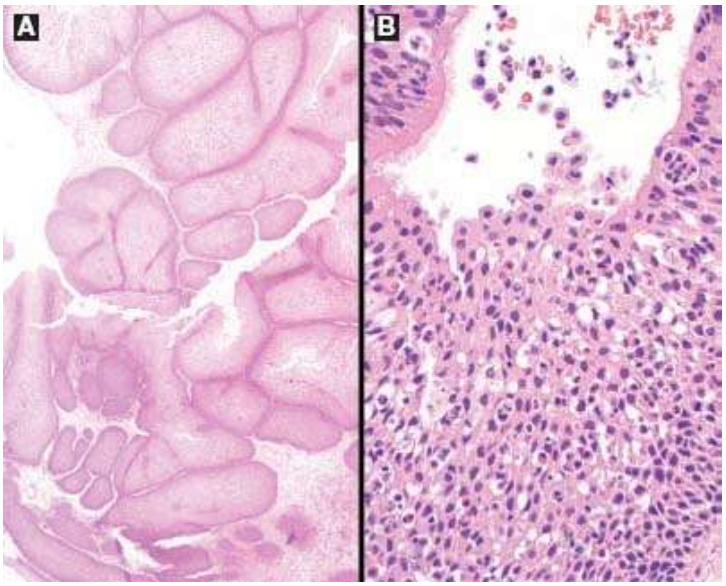
Macroscopically, no matter the histologic type, these papillomas will appear as papillary, exophytic, polypoid to bulky lesions, red or gray or brown, and firm to friable. Therefore, even though the lesion may appear clinically "exophytic," it may be histologically an inverted or oncocytic type.

Histologically, the tumors show different morphologies based on the tumor type, although overlap or combined tumors can be rarely seen:

Inverted papilloma shows a thickened epithelium bound by an intact basement membrane growing endophytically into the underlying stroma (figure 1). The epithelium is a nonkeratinizing squamous epithelium with admixed respiratory epithelial cells and goblet cells, often with cilia. Transepithelial neutrophils are common, often showing microabscess formation (figure 1). Mitoses are easily identified, usually up to the midpoint of the epithelium, although atypical forms are absent. Rarely, focal surface keratinization may be seen. The stroma is variable,

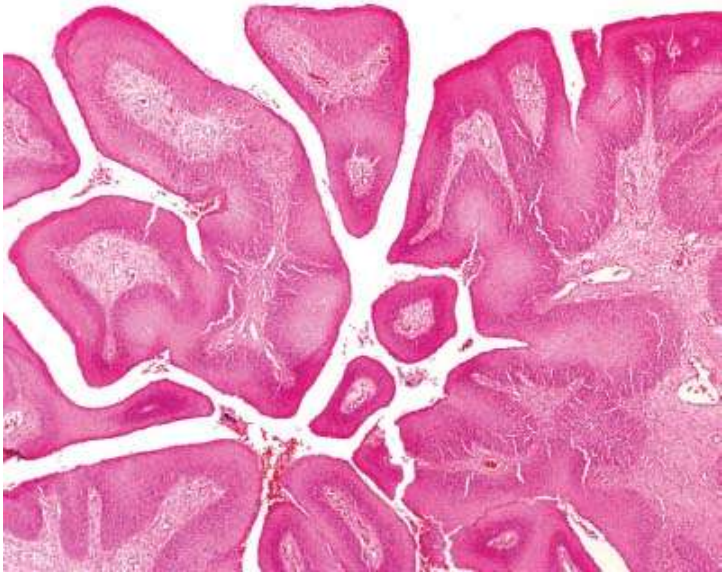
ranging from dense and fibrous to loose and myxoid, but usually without minor mucoserous glands.

Figure 1. Schneiderian papilloma, endophytic type. **A**: Multiple endophytic transitional epithelial islands are seen with an intact basement membrane. **B**: Innumerable neutrophils are present throughout the epithelium with small microabscess formation.



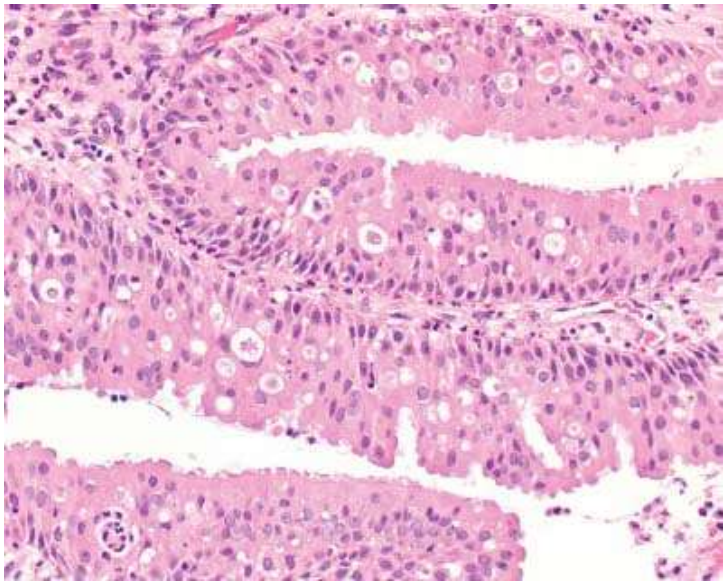
Exophytic papilloma shows delicate fibrovascular cores covered by epithelium that varies between three types: squamous; ciliated, pseudostratified columnar respiratory type epithelium; and transitional epithelium (figure 2). Isolated mucin-containing cells may be noted. Surface keratinization is uncommon unless there is chronic irritation or if the lesion is large enough to dry on the surface.

Figure 2. Filiform papillary projections into the lumen, lined by transitional epithelium without well-developed mucocytes or inflammatory cells, are seen in this exophytic type.



Oncocytic papilloma shows an epithelium composed of tall columnar cells with finely granular eosinophilic cytoplasm. Numerous small cysts filled with mucin and neutrophils are noted within the epithelium, but not in the stroma (figure 3).

Figure 3. Columnar cells with tram-tracked nuclei, abundant eosinophilic cytoplasm, and intralesional mucus-filled cysts are seen in this columnar cell type.



When carcinoma develops, squamous cell carcinoma is the most common (keratinizing or nonkeratinizing), while mucoepidermoid carcinoma, verrucous carcinoma, adenocarcinoma, and undifferentiated carcinoma may be seen. Carcinoma seems to be synchronous, although transition from papilloma to carcinoma may be seen in a few cases. Inverted and oncocytic types are more frequently associated with carcinoma than the exophytic type.

The differential diagnosis includes sinonasal inflammatory polyps, respiratory epithelial adenomatoid hamartoma, squamous papilloma (vestibular skin), inverted ductal papilloma, verruca vulgaris, rhinosporidiosis, and invasive carcinoma.

Suggested reading

1. Buchwald C, Franzmann MB, Tos M. Sinonasal papillomas: A report of 82 cases in Copenhagen County, including a longitudinal epidemiological and clinical study. Laryngoscope 1995; 105 (1): 72-9.
2. Kaufman MR, Brandwein MS, Lawson W. Sinonasal papillomas: Clinicopathologic review of 40 patients with inverted and oncocytic schneiderian papillomas. Laryngoscope 2002; 112 (8 Pt 1): 1372-7.
3. Nudell J, Chiosea S, Thompson LD. Carcinoma ex-Schneiderian papilloma (malignant transformation): A clinicopathologic and immunophenotypic study of 20 cases combined with a comprehensive review of the literature. Head Neck Pathol 2014; 8 (3): 269-86.
4. Shah AA, Evans MF, Adamson CS ,et al. HPV DNA is associated with a subset of Schneiderian papillomas but does not correlate with p16(INK4a) immunoreactivity. Head Neck Pathol 2010; 4 (2): 106-12.

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