Lymphatic Obstruction: A NovelEtiologic Factor in the Formation of Antrochoanal Polyps

Abstract

Objectives: Antrochoanal polyps (ACPs) originate from the inner wall of the maxillary sinus and either pass through the natural sinus ostia or cause pressure-induced destruction of the medial sinus wall. Eventually, they extend into the choanae and nasopharynx. Most authors who have studied the microstructure of ACPs, including the component stromal cells and surface epithelium, have not examined the transitional area between the sinus mucosa and the pedicle of the polyp. No explanation has been given for the absence of a cystic intrasinus portion of the polyp, in many cases refuting the therapy (most accepted) that polyps are caused by a mucous gland with a blocked acinus. We noted during endoscopic removal of the ACPs that the antral part of the polyp was cystic in only 5% of patients, and polypoid in 95%. The cystic intrasinus portion of the polyp is a cornerstone of the pathophysiology of ACPs, whether caused by inflammation, cicatrization, or allergy. This finding prompted us to examine the transitional area between the sinus mucosa and the pedicle of the polyp to verify the possibility that lymphatic obstruction—whether primary (areas of higher tissue pressure) or secondary (cicatrization or inflammation)—could be an etiologic factor in the formation of ACPs.

Methods: The study material consisted of 25 ACPs and 25 chronic maxillary sinusitis mucosal biopsy specimens (control group). The detection of lymphatic vessels was based on the identification of lymph vessel endothelial hyaluronic acid receptor 1 (LYVE-1) in the endothelial cells of the lymphatic capillaries. This was the first lymph-specific hyaluronic acid receptor to be characterized, and is a uniquely powerful marker for lymph vessels, ifferentiating them from (blood) capillaries.

Results: The density of the lymphatic vessels was marked in 22 of the 25 ACP specimens, ie, 88% of the ACP cases, compared with 16% of the control group.

Conclusions: This study resulted in two main findings. The first was the absence of intramaxillary cysts in the ACPs in 23 cases (92%). The second was the markedly high density of lymphatic vessels in the transitional area between the sinus mucosa and the pedicle of the ACPs, in comparison with the density in the control group. These two findings refute the "blocked acinus theory" and indicate that lymphatic obstruction, whether primary or secondary to chronic sinus infection, might play a leading role in the formation and further growth of ACPs.

Keywords

acinous mucous gland, antrochoanal polyp, endoscopic sinus surgery, functional endoscopic sinus surgery, Killian polyp, lymphatic capillary, LYVE-1, maxillary sinus, maxillary sinusitis mucosal biopsy, nasal polyp