

Nasal Polyps and its Histo-pathological Evaluation

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ABSTRACT

Background: Nasal polyposis are considered a sign or a physical finding rather than a disease resulting from a complex process that is found in some individuals, such as people suffering from chronic sinusitis, rhinitis, Kartagener's syndrome, or cystic fibrosis. Sinonasal polyps can have four distinct histological subtypes, which include eosinophilic polyp, chronic inflammatory polyp, hyperplastic polyp, and polyp with stromal atypia.

Aim: In this review, we aim to study the presentation, classification and diagnosis of nasal polyps in the light of histopathological findings. **Materials and methods:** We conducted this review using a comprehensive search of MEDLINE, PubMed, and EMBASE, January 2001, through February 2017. The following search terms were used: nasal polyp, inflammation of nasal mucosa, chronic inflammation, histology of nasal mucosa, pathology of nasal polyps. **Conclusion:** Polyposis does not have histological problems and complications. However, they may be clinically disturbing. Polyps are not classified into allergic and non-allergic, and are rather stratified according to histological findings, making histological investigation crucial for diagnosis.

Keywords: nasal polyp, ENT pathology, chronic inflammation, histology of nasal mucosa, pathology of nasal polyps.

INTRODUCTION

The word 'polyp' originates from Greece where it mean 'many feet', which indeed can describes pathogenesis of nasal polyps. Nasal polyposis can be considered a sign or a physical finding rather than a disease. This sign is the result of a complex process that is found in some individuals.

A recent publication by the European Academy of Allergology and Clinical Immunology and European Rhinologic Society, reported that nasal polyposis can be counted as a subtype of chronic rhinosinusitis [1].

When conducting studies on the histology of nasal polyps, it was found that it was the result of extracellular fluid accumulation, a mild inflammatory process, and proliferation of mucosa and submucosa within the perinasal sinus or the turbinates. Adults are more likely to develop nasal polyps than children, and the presence of nasal polyps in children usually indicates an underlying Kartagener syndrome (cilia dyskinesia syndrome) or cystic fibrosis.

On the other hand, chronic sinusitis or rhinitis are common causes in adults. The prevalence of nasal polyposis has been found to be up to 4.3% of adults, which is near to the prevalence of several other diseases like chronic obstructive lung disease, diabetes, and asthma. However, many researchers argue that these numbers are overestimated and the real prevalence may be less. Some studies on autopsies, have interestingly found nasal polyps in

about 30% of patients who had never suffered from any symptoms during their lives [2].

No evidence is present to support the association between atopic allergy and nasal polyposis, and both atopic and nonatopic adults can suffer from nasal polyps, with similar prevalence in both populations. However, up to 32.6% adults with nasal polyps report at least an attack of asthma or bronchospasm. Moreover, 85% of asthmatics on steroids were shown to have sinus abnormalities on CT. Patients who suffer from asthma can have double the risk of developing polyps when they are compared with patients without asthma, and nonallergic asthma (13%) is associated with a higher risk than allergic asthma (5%). The previous results have led to the suggestions that allergy does not predispose to polyps, but bronchial asthma does. Additionally, patients who have aspirin hypersensitivity along with asthma, have polyps in up to 90% of cases, which is known as the 'aspirin triad'. Another relatively rare entity of nasal polyps is antrochoanal polyps, which constitutes about 5% of all polyps. The formal type is more likely to be found in males, asthmatics, or patients with primary ciliary dyskinesia, Churg-Strauss Syndrome, cystic fibrosis, Young syndrome, or inherited or acquired anatomical abnormalities of sinuses or nasal cavity [3].

Clinical Features

Many cases of chronic rhinosinusitis are either asymptomatic, or manifest with non-specific signs and symptoms like fatigue, headache, and/or pain in the facial area. Other manifestations can include progressive nasal congestion, and watery/purulent nasal discharge. In cases of complete nasal occlusion, a nasal timbre of the voice, and hyposmia are usually present. The presence of the previous signs and symptoms for more than twelve weeks make the diagnosis of chronic rhinosinusitis ^[4].

Polyps are usually gelatinous, round-shaped, smooth structures that originate from the middle meatus or the ethmoid sinuses. They can be easily found when performing a frontal rhinoscopic examination. Edema is often present in the nasal mucosa making it hyperemic. However, a posterior rhinoscopy will be needed to detect polyps' origin. The pharynx may contain mucus/purulent drip. Most polyps were found to originate from the clefts mucosa, ostia mucosa, and ostiomeatal complex recesses ^[5].

The usual method to diagnose nasal polyps is classic radiography. However, it is recommended to convert management to make coronal CT the first step. It was found that staging of polyps with CT will help to assess the severity of inflammation and damage to the sinuses. Moreover, CT provides a more accurate view of the sinuses. CT of the perinasal sinuses is required before any surgery ^[6].

SINONASAL MUCOSA

As we mentioned earlier, the ethmoidal region and the middle meatus give raise to most nasal polyps. Normally, respiratory epithelium lines the sinonasal tract. The epithelium includes pseudostratified, ciliated columnar cell epithelium with interspersed goblet cells, and metaplastic squamous cell epithelium, which is always found in any normal epithelium. Some metaplastic areas have also been found to be present in the nasal polyps, and can rarely be found along with dysplastic areas ^[7].

Using histological evidence, the claim that the pituitary gland secretes nasal discharge has been denied. Since then, the nasal cavity epithelium has been called the Schneiderian membrane. The Schneiderian membrane constitutes histologically of a normal pseudostratified, columnar, and ciliated respiratory epithelium. When comparing the histology of the nasal cavity to the histology of paranasal sinuses, several differences exist. These differences include the thin, less specialized appearance of the mucosa of paranasal sinuses, which

have relatively few goblet cells and cilia. In addition, the lamina propria of paranasal sinuses contain a fewer number of seromucinous glands.

All these differences may be the reason behind the relatively weaker resistance of sinuses when encountering infections as compared to the nasal cavity ^[8].

GROSS APPEARANCE

Polyps are usually described as lobular, mobile swelling that have a soft consistency. Also, they are usually shiny with a translucent pink appearance. Polyps have a pale, moist cut surface that may be red in cases of highly vascular polyps. Nasal polyps are different from sinonasal inverted papillomas by being translucent, and without corrugation of their surfaces. The size of a polyp can vary widely, with most polyps being about 2-3 cm. In some cases, polyps are found in groups, with larger size and sometimes enlarging nose. A subtype of polyps is antrochoanal polyps is usually found in children with larger sizes that may cause the polyp to bulge via the posterior choana into the nasopharynx ^[9].

HISTOLOGICAL STRUCTURE

Sinonasal polyps have four distinct histological subtypes. Although may seem academic, this classification is essential to rule out a neoplastic cause. The most common type of polyps is allergic, edematous, and eosinophilic polyp. The next most common type is polyps with chronic inflammation confirmed histologically. The third type can histologically look very similar to the first type. However, it also has seromucinous glands hyperplasia. Sometimes this subtype is wrongly diagnosed as an adenoma. The fourth type, which is relatively rare, constitutes of stromal atypia. Many cases actually have combinations of one or more of these histological types. This may be explained by the relation between polyps and different predisposing factors ^[5].

Edematous, Eosinophilic (Allergic) Polyp

This is considered the most common histological types and is found in up to 86% of cases. It is characterized by the following:

- 1) pronounced hyperplasia of goblet cells;
- 2) thick basement membrane with hyalinization;
- 3) the presence of eosinophils and mast cells in the stroma; and 4) edematous stroma. Stroma of these polyps will also have fibroblasts, inflammatory cells, and fluid that create pseudocystic spaces. Inflammatory cells are usually present in moderate

amount. However, they sometimes may be found in large amounts. These polyps are usually present bilaterally^[10].

Chronic Inflammatory Polyp (Fibroinflammatory Polyp)

This type is considered the second most common with about 8.4% of cases, and is characterized by lacking hyperplasia of goblet cells and stromal edema. On the other hand, metaplastic changes squamous and cuboidal epithelium is usually present. Basement membrane thickening may also be present although milder than the previous type. Intense lymphocyte-predominant inflammatory infiltrate is present. Many fibroblasts with fibrosis are found in the stroma. Seromucinous glands hyperplasia and dilated vessels are also found^[9].

Polyp with Hyperplasia of Seromucinous Glands

In this type, which constitutes less than 5% of cases, seromucinous glands are often present in stroma which is edematous. This type can have features that are similar to the first most common type. The main difference between the two is the presence of more glands along with ductal structure in this type. Sometimes, glandular hyperplasia can be wrongly diagnosed as a tubulocystic adenoma. In this type, histological examination typically finds many cylindrical glands with eccentrically-placed nuclei are present. These glands are usually connected to the epithelium and does not show any atypia. These glands are also separated^[11].

Polyp with Stromal Atypia

This is a very rare type that can be hardly distinguished from neoplasms microscopically. Grossly, it can look similar to other types of polyps. However, the histological findings include bizarre atypical cells, which is hyperchromatic and stellate. Sometimes these cells can be irregular with the presence of vesicular cytoplasm. These atypical cells are only present in few areas of the polyp that reflect reactive fibroblasts. Only few cases show the presence of atypical cells in the whole polyp. The most distinguishing feature of this type from a neoplasm is the lack of mitoses. Moreover, the absence of cytoplasmic cross-striation and glycogen content, are characteristic. Malignancies (like malignant melanoma and neurogenic sarcoma) can be definitely ruled out by immunostaining^[12].

CONCLUSION

Sinonasal polyps are defined as nonneoplastic swelling in the mucosa of the sinonasal area, with varying histological findings that range from neoplasm to edematous mucosa. They usually originate from the ethmoid sinus and the middle meatus and appear in the nasal cavity. Other cases where polyps can originate include turbinates and the maxillary sinuses. Polyposis does not have histological problems and complications. However, they may be clinically disturbing. Polyps are not classified into allergic and non-allergic, and are rather stratified according to histological findings, making histological investigation crucial for diagnosis.

The study was done after approval of ethical board of King Khalid university.

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