



# Nasal polyposis in laryngectomy patients

## *Larenjektomili hastalarda nazal polyposis*

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### ABSTRACT

Although the exact mechanism of nasal polyposis is unknown, the most emphasized etiologies are related with impaired nasal physiology, anatomy, and aerodynamic factors. In this report, we aimed to discuss the suspicious etiologic factors of nasal polyposis and to emphasize the importance of nasal examination in laryngectomy patients, even if nasal airway is not being used. Herein, we reported two total laryngectomy cases diagnosed with nasal polyposis who were applied tracheostomy instead of nasal airway. The nasal cavities of laryngectomy patients must be carefully evaluated in order to prevent nondiagnostic nasal pathologies.

**Keywords:** Etiology, laryngectomy, nasal polyposis, physical examination.

### ÖZ

Nazal polipozun kesin mekanizması bilinmemekle birlikte, en çok bozulmuş nazal fizyoloji, anatomi ve aerodinamik faktörlerle ilişkili etyolojiler üzerinde durulmaktadır. Bu yazıda nazal polipozisin tartışılmalı etyolojik faktörleri tartışıldı ve larenjektomili hastalarda nazal havayolu kullanılmasa bile nazal muayenenin önemi vurgulandı. Bu çalışmada, nazal hava yolu yerine trakeostomi uygulanan nazal polipozis tanısı konan total larenjektomili iki olguyu sunuldu. Tanısal olmayan nazal patolojileri önlemek için larenjektomi hastalarının burun boşlukları dikkatlice değerlendirilmelidir.

**Anahtar sözcükler:** Etiyoloji, larenjektomi, nazal polipozis, fizik muayene.

Nasal polyposis (NP) is a chronic inflammatory process of the nasal cavity and paranasal sinuses, arising from the mucosa around the middle meatus and usually causes nasal obstruction. The exact etiopathology of nasal polyps is not well known and the underlying inflammatory process seems multifactorial. The most common emphasized reasons are genetic factors, anatomical disorders, mucosal reactions, allergies, immunologic factors, Bernoulli phenomenon, and epithelial rupture theory.<sup>[1]</sup> In addition, it is thought that the aerodynamic changes in the nasal cavity play an important role in the development of nasal polyposis.<sup>[2]</sup>

In total laryngectomy, the patient's upper and lower respiratory tract is separated with permanent tracheostomy. The nasal cavity is not used for breathing and this may cause certain physiological, cytological, and histological changes in the nasal cavity and mucosa.<sup>[3-5]</sup> However, among these changes, nasal polyposis is not an expected outcome in laryngectomized patients. To the best of our knowledge, this is the second report on this issue. In this article, we present two cases of nasal polyposis that developed years after total laryngectomy. Clinicians should take nasal pathologies into consideration when evaluating laryngectomized patients without any significant nasal symptoms.

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## CASE REPORT

**Case 1-** A 68-year-old male patient was referred to our outpatient clinic with complaints of non-specific facial pain which had started about two years ago. With these complaints he went to different otolaryngologists for nasal discharge and was diagnosed and treated for rhinitis. The patient underwent total laryngectomy due to squamous cell laryngeal carcinoma 36 years ago. He did not receive radiotherapy after surgery. Anterior rhinoscopic examination revealed minimal secretion and nasal polyps that completely filled the bilateral nasal cavity. Paranasal computed tomography (CT) revealed diffuse polyposis in soft tissue densities in both nasal cavities and frontal sinuses (Figure 1a). The patient was treated with systemic and local corticosteroids and antibiotics for three weeks. After this time, functional endoscopic sinus surgery (FESS) was applied under general anesthesia. Histopathological analysis confirmed inflammatory nasal polyps. No complications were observed during and after the surgery. Patient remained symptom-free 13 months after the surgery.

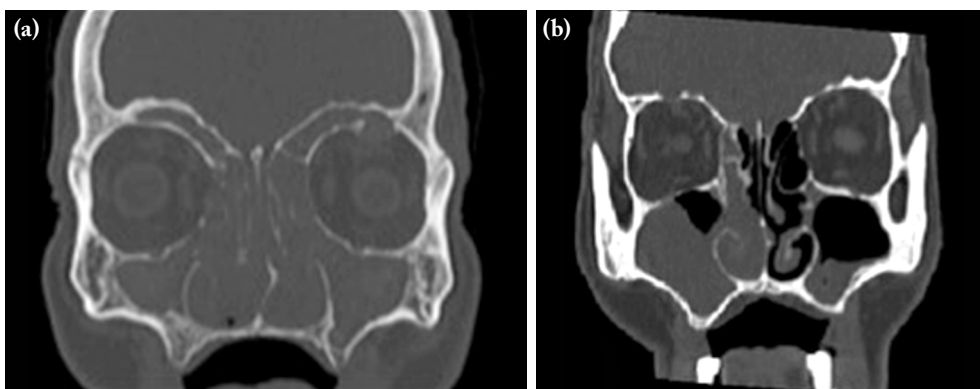
**Case 2-** A 73-year-old male patient was admitted to our clinic with non-specific nasal symptoms. He had facial pain, headache, and nasal discharge. His symptoms were minimal and did not ignore before. He had undergone total laryngectomy for advanced squamous cell carcinoma of the larynx 15 years ago. He did not receive adjuvant radiochemotherapy after surgery. Anterior rhinoscopic and flexible endoscopic examinations were performed and nasal polyps and purulent secretions were observed in the right nasal cavity. Paranasal CT revealed nasal polyps in the right nasal cavity and sinuses (Figure 1b). Medical management with oral, intranasal steroids, and

antibiotics was ineffective, and FESS was carried out under general anesthesia. No predisposing factors were found in the patient and no complications were detected. No recurrence was observed during the 19-month follow-up period.

## DISCUSSION

The main physiological functions of the nasal mucosa are filtering, heating, moistening of the air, smelling, and mucociliary clearance, and nasal airflow must be ongoing in order to maintain these functions. However, laryngectomized patients have complete separation of upper and lower respiratory tracts. Riva et al.<sup>[3,6]</sup> showed that direct airflow through the trachea may result in loss of these functions. Cytological and histological changes have also been studied among these impaired nasal functions of laryngectomized patients.<sup>[3,4]</sup> It has been shown that mucosal transit time was affected and that epithelium of the nasal cavity transitioned to columnar epithelium.<sup>[7]</sup> Fisher et al.<sup>[8]</sup> demonstrated mucosal atrophy and decreased number of goblet cells. Nasal blood flow was shown to be decreased and the nasal cycle was not detected in these patients.<sup>[9]</sup> Riva et al.<sup>[6]</sup> found nasal cavities of laryngectomized patients with bacterial flora colonization without signs or symptoms of infection.

Ogawa<sup>[2]</sup> concluded that aerodynamic factors had a role in the formation of nasal polyps in addition to specific inflammatory changes. Musy and Kountakis<sup>[10]</sup> found higher failure rates in patients with obstructed and hypoventilated osteomeatal complex anatomy. Bernoulli phenomenon is based on the principle that during expiration and inspiration, the negative pressure that forms there when passing through a narrow zone of air draws intact mucosa. According to



**Figure 1.** (a) Coronal section of paranasal computed tomography scan revealed bilateral massive nasal polyps formation and loss of aeration in all paranasal sinuses and nasal cavities. (b) Coronal section of the paranasal computed tomography revealed right sided soft tissue in the nasal cavity, maxillary and ethmoid sinuses.

this phenomenon, the stiffness of the middle turbinate and the negative pressure behind it may explain the polyp formation.<sup>[11]</sup> We believe that these mechanisms and anatomic causes may be less effective in the formation of polyps.

Both of our patients underwent operation over 15 years ago and had permanent tracheostomy. As many years pass, the physiological changes are thought to develop. When the histories of the patients were evaluated, no predisposing factors for polyp formation were detected. Both of the patients were using electrolarynx device for voice rehabilitation and as a consequence, were not using nasal airway. The polyp formation mechanism in our patients was not apparent. Neither the anatomic factors nor the aerodynamic factors seemed effective in the formation of polyps. Although there is no study about this issue, the decreased blood flow of the nasal cavity and micro-environmental changes of middle meatus may be the cause of nasal polyposis in these patients.

Although there is evidence of increased lower respiratory tract infections, there is no evidence for increased nasal cavity pathologies in laryngectomized patients.<sup>[12]</sup> There is no study on the incidence of nasal polyposis in laryngectomy patients. According to the literature, there is only one report of nasal polyposis that developed in a laryngectomy patient. This rarity may be the result of undiagnosed patients due to inadequate examination of the nasal cavity. Usually clinicians do not pay attention to the nose of these patients because it is seen as non-functioning. However, undiagnosed nasal polyposis may cause advanced sinusitis and complications. Therefore, nasal examination must be performed in laryngectomized patients to prevent delayed diagnosis. In addition, we believe that secondary malignancies should be checked, and nasal and nasopharyngeal examination must be performed in routine follow-up.

### Conclusion

Although the nose seems non-functioning in these patients, pathologies of the nasal cavity may be encountered. Nasal and paranasal examination of these patients are required for early detection of nasal and paranasal pathologies.

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