

What is the cause of hypertrophy in asymmetric tonsils?

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Abstract. Objectives: Asymmetric tonsillar hypertrophy is a condition, confirmed by physical examination, that can be found in every age group. The aim of this study was to compare each tonsil through macroscopic and microscopic assessment of specimens and reveal the reasons that cause one tonsil to grow more than the other.

Methodology: The study was carried out with 93 patients who were indicated for tonsillectomy in the authors' Clinic. Of these 93 patients, seven cases who had clinically asymmetric but pathologically symmetric tonsils were excluded from the study. The presence of microscopic intraepithelial abscess, *Helicobacter pylori* with Giemsa stain, *Coccobacillus*, fungus, *Actinomyces* with Pas-Grocott stain, dysplasia or hyperplasia, malignancy and reactive changes in the epithelium were evaluated.

Results: The study was conducted with 86 patients aged between two and 35, of whom 32 were women (37.2%) and 54 were men (62.8%). The mean age of cases was 8.37 ± 5.95 . The mean difference between two tonsils ranged from 1 to 12 mm, mean 3.67 ± 2.56 mm. When the findings were examined, the presence of *H. pylori*, *Coccobacillus*, fungus and *Actinomyces*, reactive changes in the epithelium, pattern of hyperplasia, intraepithelial abscess and macroscopic presence of pus did not reveal any statistically significant changes.

Conclusion: The reasons behind asymmetric tonsil hypertrophies and how they are related to malignancies have not yet been clarified. There is no statistically significant difference between the evaluated parameters in the present study. This study has brought a new point of view to the subject by comparing different-sized tonsils in the same person, thus paving the way for future studies with a broader scope

Introduction

Asymmetric tonsillar hypertrophy is a condition, confirmed by physical examination, that can be found in every age group. There are various approaches to asymmetric tonsillar hypertrophy. Kumar *et al.* stated that asymmetric tonsillar hypertrophy can be observed in lymphoma; however, it is usually an illusion in patients with deep tonsillar fossa and, besides, a clinically large tonsil can sometimes be found to be smaller in histopathological studies.¹ In their clinical trial of 1,132 tonsil specimens, Kalcioğlu *et al.* concluded that histopathological examination of routine tonsillectomy specimens is not necessary in patients with no clinical suspicion of malignancy.² There are various studies in the medical literature on asymmetric tonsillar hypertrophy; however, most of them are concerned with malignancies and

routine pathological screening.^{1,3}

In this study, histopathological analysis of tonsillectomy specimens from 93 patients with clinically asymmetric tonsillar hypertrophy was performed. The aim was to investigate the factors that cause one tonsil to grow larger than the other one and the reasons for this asymmetry, as well as to compare the two tonsils with each other. For this purpose, the parameters, such as the presence of intraepithelial abscess, *Helicobacter pylori* (*H. pylori*) with Giemsa stain, *Coccobacillus*, fungus, *Actinomyces* with Pas-Grocott stain, epithelial dysplasia and/or hyperplasia, malignancy and reactive epithelial changes were analysed. In addition, tonsil sizes were measured and macroscopic presence of pus was assessed.

Materials and methods

The study protocol was approved by the Ethics Committee of Istanbul Medeniyet University (decision no: 29-I, date: 28.12.2012). Ninety-three patients with clinically asymmetric tonsillar hypertrophy who underwent tonsillectomy between January 2013 and June 2013 were evaluated. Before the tonsillectomy procedure, each patient or the patient's relative signed a detailed consent form. Tonsillectomy materials were evaluated by the pathology department at the same hospital. Of these 93 patients, seven subjects who had clinically asymmetric but pathologically symmetric tonsils were excluded from the study. Detailed anamnesis concerning the patient's demographic data such as age, sex, medical history and family history were obtained from the patient or patient's relative.

Children with a medical history of asthma and heart or kidney failure were excluded from the study. Patients who had already undergone tonsillectomy or tonsillotomy and who according to laboratory results had a disorder or history of haemorrhage were also excluded. Clinical anamnesis established the number of tonsillitis attacks in a year, the presence of snoring, sleeping with mouth open, sleep apnoea, nasal obstruction, nasal discharge, hearing impairment, difficulty in swallowing and loss of appetite.

All patients underwent otoscopic examination, anterior rhinoscopy and oropharynx examination. Tonsil sizes were evaluated using Brodsky's grading scale based on tonsillar obstruction, where 0 = no obstruction, 1+ = less than 25% airway obstruction, 2+ = 25-50% airway obstruction, 3+ = 50-75% airway obstruction and 4+ = airway obstruction of more than 75%

The main indication for tonsillectomy was chronic tonsillitis (n: 58). Obstruction and sleeping disorders associated with chronic tonsillitis were the second most common indication (n: 27). One patient was operated on for symptoms suggesting malignancy. Tonsillectomy operations were performed under general anaesthesia using the cold dissection technique. Specimens were sent to the pathology laboratory in formol with the right and left tonsils separated from each other. After the necessary procedures, the tissues were stained with haematoxylin and eosin, periodic acid-Schiff (PAS) and Giemsa in the pathology laboratory. The presence of microscopic intraepithelial abscess, *H. pylori* with Giemsa stain, *Coccobacillus*, fungus, *Actinomyces* with Pas-Grocott stain, dysplasia or

hyperplasia, malignancy and reactive changes in the epithelium was evaluated. In addition, the size of the tonsils was measured and the amount of pus was assessed.

Results

The pathology reports were statistically evaluated. A total of 86 patients [32 female (37.2%) and 54 male (62.8%)] were included in the study. Patients ranged in age between two and 35 years. The mean age of the subjects was 8.37 ± 5.95 years. The mean difference between two tonsils ranged from 1 to 12 mm, mean 3.67 ± 2.56 mm. While there was no *H. pylori* in 90.7% of cases, in 2.3% of cases, *H. pylori* reproduction was observed in the larger tonsil, in 1.2% in the smaller tonsil and in 5.8% it was bilateral (Figure 1-a). There was no difference in the frequency of *H. pylori* reproduction between the larger tonsil and smaller tonsil ($p = 1$, $p > 0.05$).

In 8.1% of cases, *Actinomyces* reproduction was observed on the side where the tonsil was larger, in 4.7% reproduction was on the side of the smaller tonsil and in 8.1% it was bilateral, while there was no *Actinomyces* reproduction in 79.1% of cases (Figure 1-b). There was no significant difference in the presence of *Actinomyces* between the larger side and the smaller side ($p = 0.689$, $p > 0.05$).

When the epithelium was evaluated, there was no epithelial hyperplasia in 82.6% of cases. Bilateral hyperplasia was observed in 15.6% of patients. In 2.3% of subjects, hyperplasia was seen on the larger side and it was not found to be statistically significant ($p = 0.484$, $p > 0.05$). In 38.4% of patients there were no reactive changes, while bilateral reactive changes were observed in 57% of subjects. In 4.7%, reactive changes were present in the larger tonsil and it was not found to be statistically significant ($p = 0.119$, $p > 0.05$) (Figure 1-c).

There was no intraepithelial abscess in 26.7% of cases, but in 8.1%, abscess was found in the larger tonsil, in 1.2% in the smaller tonsil and bilateral intraepithelial abscesses were observed in 64% of cases (Figure 1-d). There was no significant difference between the ratio of abscess existence in the larger and smaller side ($p = 0.063$, $p > 0.05$).

There was no *Coccobacillus* reproduction in 65.1% of patients, while it was detected in the larger tonsil in 2.3% of subjects and bilaterally in 32.6% of cases. There was no significant difference

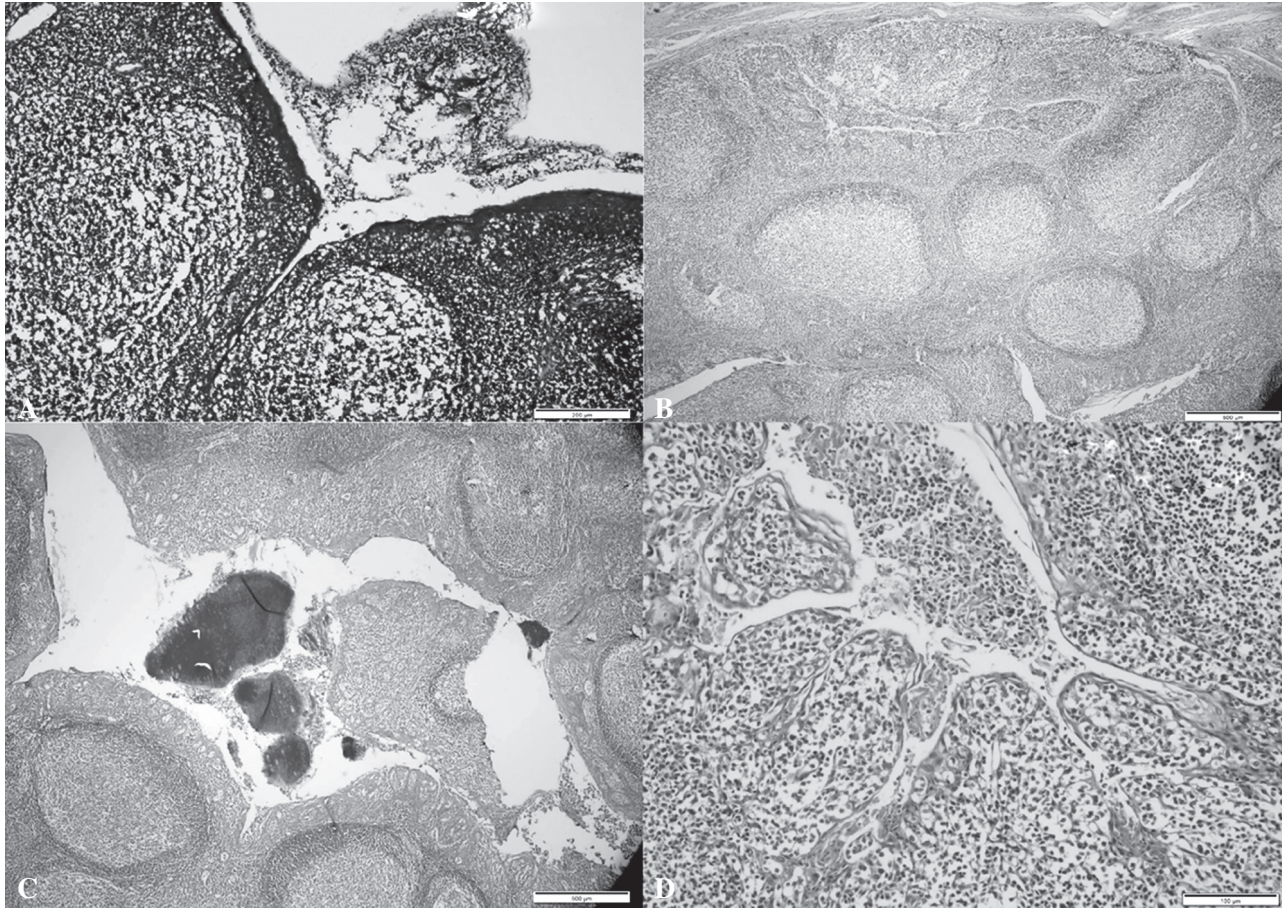


Figure 1-a: Small amount of *H. pylori* stack on the crypt surface (Giemsa x10), Figure 1-b: *Actinomyces* colonies in tonsillar crypts (PAS x4), Figure 1-c: Lymphoid follicles with evident reactive hyperplasia (Haematoxylin & Eosin x4), Figure 1-d: Abscess spots and pus on the lumen of the crypt epithelium (Haematoxylin & Eosin x20)

in reproduction of *Coccobacillus* between the larger side and the smaller side ($p = 0.492$, $p > 0.05$).

There was no fungi reproduction in 91.9% of cases, while fungus was seen in the smaller tonsil in 2.3% and bilaterally in 5.8% of patients. There was no significant difference in the ratio of fungi reproduction between the smaller side and bilateral reproduction ($p = 0.47$, $p > 0.05$).

In one patient, the findings of preoperative physical examination showing tonsillar hypertrophy grade 3+ in the right tonsil and grade 1+ in the left tonsil were clinically and physically suspected to be malignant. Pathological analysis revealed squamous cell carcinoma.

Macroscopic examination of the crypts revealed no pus in 81.4% of cases. There was pus in the larger tonsil in 2.3% of patients, in the smaller patients in 1.2% and bilaterally in 15.1% of subjects. There was no significant difference in

the presence of pus between the larger and smaller sides ($p = 1$, $p > 0.05$).

Discussion

There are a number of discussions considering the approach to asymmetrical tonsillar hypertrophies. These are mostly about the need for routine pathological evaluation or indications for tonsillectomy in patients with asymmetrical tonsils. Beaty *et al.* reported that unilateral tonsillar hypertrophy in infants is rarely associated with risk for malignancy.⁴ The present study also found no malignancies in infants.

Several authors have suggested that tonsillar asymmetry is caused by the mucosa of the tonsil and that the diagnosis of malignancy could be made by oropharyngeal examination.^{4,6}

Beaty *et al.* identified some risk factors,

including a prior history of head and neck cancer, tonsillar asymmetry, a palpable mass, a visible lesion in the tonsil, adenopathy in the neck and systemic symptoms associated with tonsillar malignancy.⁴ In a study on 2,012 patients performed in cooperation with the American Society of Pediatric Otolaryngology, Dohar and Bonilla investigated the need for pathological examination of routine tonsillectomy specimens. Only one subject was diagnosed with lymphoma. They stated that there was no consensus on the best way to examine routine adenotonsillectomy specimens in children.⁷ They underlined the fact that the presence of unilateral tonsillar hypertrophy is not enough to fulfil the criteria for malignancy on its own without an accompanying unilateral cervical lymphadenopathy and other systemic findings.⁸

The most common malignancy of the palatine tonsil is squamous cell carcinoma, with a prevalence of 85%, followed by lymphomas with 14%.⁹ In the present study, there was only one adult with malignancy among the 93 patients. The patient attended the authors' clinic with a mass in the neck, night sweats, loss of weight within the last three months and difficulty in swallowing and breathing. Clinical and physical examination showed an increased risk of malignancy. Pathological analysis revealed squamous cell carcinoma of the right tonsil. Considering the risk factors, there were no other patients with suspected malignancy.

In their study on 47 children with asymmetric tonsillar presentation, Spinou *et al.* reported that, in seven subjects (15%), the clinically larger tonsil was found to be smaller than the other tonsil and, in 17 subjects (36%), there was no difference in size between the two tonsils.¹⁰

In a study by Berkowitz *et al.*, true tonsillar asymmetry was confirmed in only 48% of 44 children.⁸ The present study aimed to determine the causes of tonsillar asymmetry and the histopathological findings of an asymmetric tonsil by comparing the larger tonsil with the smaller one in patients with asymmetric tonsil, considering the following parameters: intraepithelial abscess, Coccobacillus, fungus, Actinomyces and *H. pylori*, hyperplasia, epithelial dysplasia, malignancy, reactive changes in the epithelium and macroscopic pus. Not all of the clinically asymmetric tonsils were confirmed to be asymmetric in the macroscopic measurements of histopathological examination. There was no evident difference in size between

the two tonsils in seven of the 93 patients.

Palatine tonsils play a significant role in the immune system. However, especially in infants, they may also be a source of recurrent and chronic infections, which can lead to hypertrophy resulting from immunological reactions taking place in the tonsils.¹¹

It has been shown that the most common cause of chronic infections is group A beta-haemolytic streptococci, followed by *S. Aureus*, Haemophilus influenza and anaerobic bacteria.¹² Furthermore, there have been several studies reporting that Actinomyces, gram-positive anaerobic bacteria, which were first isolated from a tonsil in 1896, may be the cause of chronic tonsillitis and tonsillar hypertrophy.¹³⁻¹⁵

Bhargava *et al.* reported the association of Actinomyces with tonsillar pathologies and hypertrophies.¹³ In contrast, the present study found no significant difference between the larger tonsil and the smaller one, although the rate of Actinomyces isolation was 20%.

H. pylori, which is a gram-negative microaerophilic bacterium, was first isolated from the tonsils and adenoid tissue by Yilmaz *et al.* and was reported to cause otitis media with effusion.¹⁶ Subsequently, Eyigor and Vayisoglu suggested that *H. pylori* plays a role in the development of chronic tonsillitis.¹⁷⁻¹⁸

Rozga *et al.* reported that the most common fungal infection in tonsillectomy specimens was *Candida* spp, but there was no correlation between fungal infection and the size of the tonsil.¹⁹ Several studies have stated that the most common causes of recurrent tonsillitis are Streptococcus, *S. Aureus*, *Moraxella catarrhalis* and *H. influenza*.²⁰⁻²¹ However, unlike the published studies, the present study attempted to investigate whether these factors cause tonsillar hypertrophies and/or asymmetry or not. The larger tonsil was compared with the smaller one. Upon examination of the results, there was no significant difference in Coccobacillus, fungus, Actinomyces and *H. pylori* isolations between the larger tonsil and the smaller one. In general, Coccobacilli were seen in 34.9% of cases, Actinomyces in 20.9%, *H. pylori* in 9.3% and fungus in 8.1% of patients, although this does not explain the asymmetry. These results are similar to those of studies on tonsillar hypertrophies in the literature, although it is statistically evident that they do not enlarge a tonsil more than the other

one.¹³⁻¹⁵

Conclusion

The causes of asymmetric tonsillar hypertrophies and indications for surgery remain controversial. The reasons behind asymmetric tonsil hypertrophies and how they are related to malignancies have not yet been clarified. There is no statistically significant difference between the evaluated parameters in the present study, which has brought a new point of view to the subject by comparing the different-sized tonsils of the same person, thus paving the way for future studies with a broader scope

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