

Nature of Palatine and Nasopharyngeal Tonsils after Tonsillectomy and Adenoidectomy among the population in Al-Kharj City: A Retrospective Study

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Abstract

Background: In both adults and children, tonsillectomy and adenoidectomy are frequently done surgeries for a range of causes. **Aim of Study:** The aim of the study was to investigate the histological characteristics of tonsillectomy and adenoidectomy specimens among Al-Kharj City residents. **Materials and Methods:** Information from the medical records of 296 patients who had tonsillectomies or adenoidectomies at the Department of Otolaryngology, The Military Industries Hospital Al-Kharj, Saudi Arabia, was used in this retrospective research. The age range was 12–60. Every tonsillectomy specimen was sent for histopathology, and any abnormal results were recorded. A statistical study was carried out. **Results:** About 58.4% were males and 41.5% were females. 66.5% of cases. Most of the cases (48.6%) were under 20 years old and had recurrent tonsillitis with palatine and pharyngeal tonsil hypertrophy. Tonsil-adenoidectomies were carried out in 66.5% of cases. Concurrent recurring infections and enlargement of the palatine and nasopharyngeal tonsils were the primary indications for surgery. In nine cases, the malignant specimen was found to be nasopharyngeal carcinoma. **Conclusion:** The most frequent lesion identified following tonsillectomy and adenoidectomy is chronic tonsillitis with adenoid. Therefore, histopathology is essential for the diagnosis of both neoplastic and non-neoplastic lesions.

Key words: Adenoidectomy, Al-Kharj, histopathology, retrospective, tonsillectomy

INTRODUCTION

Non-encapsulated nodules of lymphoid tissue from the respiratory and digestive tract epithelium make up the palatine and nasopharyngeal tonsils. Part of Waldeyer's ring is composed of the pharyngeal and palatine tonsils, which are small but physiologically complicated mucosa-associated lymphoid tissues.^[1] Because these structures are exposed to both airborne and dietary antigens, the lymphoepithelial components of Waldeyer's ring are positioned advantageously to carry out regional immunological tasks.^[2] Non-keratinous stratified squamous epithelium

covers the palatine tonsils' mucosal surface. Ciliated columnar pseudostratified goblet cells and non-keratinous stratified squamous epithelium cover the nasopharyngeal tonsils.^[3]

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Although the tonsils lack afferent lymphatics, the transfer of lymphocytes from the blood to the tonsils is necessary for their immunological competence.^[4] In response to antigenic stimulation, the adenoids are more reactive and exhibit noticeably more lymphocyte proliferation than the palatine tonsils.^[5] Crypts lined by squamous epithelium that reach deep into the tonsil include debris made up of fungi, bacteria (particularly actinomyces), and desquamated epithelium. There are nodules, frequently with germinal centers, in the lymphoid tissue that surrounds the crypts. The tonsil lymphocytes infiltrate the epithelial layer deep into the crypts, causing it to become hazy. The tonsil's non-surface portions are covered by a capsule, and connective tissue septum protrude from the capsule into the tonsil.^[6]

One of the most prevalent infectious infections among young people is tonsillitis. Tonsillitis is caused by a variety of species, including bacteria like beta-hemolytic *Streptococcus* and viruses. Rarely, fungi or parasites may be the culprit. When acute tonsillitis episodes occur frequently, tonsillectomy is usually recommended. Obstructive sleep apnea, quinsy, tonsiloliths, tonsillar cysts, and suspicions of cancer are other reasons for tonsillectomy.^[7] Located in the upper posterior pharynx, the pharyngeal tonsil, also known as Luschka's tonsil, is a single structure made up of flat longitudinal folds with seromucous glandular ducts opening on the base. Their capsule is finer and fragmentary, and they do not exhibit crypts. Two types of epithelium cover them: Non-keratinous stratified epithelium and ciliated columnar pseudo-stratified with goblet cells. This can manifest either on its own or in conjunction with other conditions, with the latter being the more common.^[8]

This study analyses the histological findings of tonsillectomy and adenoidectomy tissues from Saudi patients who were referred to the Al-Kharj Military Industries Hospital's histopathology department for histological examination.

MATERIALS AND METHODS

This retrospective analysis used information from the medical records of 296 patients who had undergone tonsillectomy or adenoidectomy at the Department of Otolaryngology, The Military Industries Hospital Al-Kharj, Saudi Arabia, between January 2023 and December 2025. Patients were chosen for evaluation at the ambulatory clinic based on their history of hypertrophy palatine, pharyngeal tonsils, and/or recurrent tonsillitis. Every patient had general anesthesia, anterior pillar arch-form incision, and peritonsillar dissection. The Beckmann curette was used to remove the pharyngeal tonsils. Due to a clinical indication, patients had palatine and/or pharyngeal tonsillectomy. The specimens were sent to the pathology department for histological examination after being promptly preserved in sterile glasses containing 10% formaldehyde. After being preserved in formol for a full day, the surgical specimen was dehydrated and subjected to a block (5 µm thick) histological process in paraffin, which

was then colored with hematoxylin-eosin and examined under a microscope. Pathologists from the Pathology Department performed the examinations in accordance with the compliance criteria. Frequencies and measures of central trends were used to analyze the quantitative data gathered for this study. Fisher's Exact and 2-sided Chi-squared tests were used to determine statistical significance. Statistical Package for the Social Sciences version 25 (IBM, New York, USA) was used for all statistical analysis.

RESULTS

Medical data of 296 patients who underwent tonsillectomy or adenoidectomy have been revised for this study of them, 173 (58.4%) were males, and 123 (41.5%) were females. The age range of the patients was 12–60. 144 patients (48.6%) were under the age of 20. Of the subjects, 84 (28.3%) were in the age range of 21–30. Just nine participants (3%) were in the 51–60 age range [Table 1].

The histopathological results of chronic tonsillitis with adenoid included follicular lymphoid hyperplasia, reticulation of the crypts, and inflammation of the covering epithelium. Follicular hyperplasia was the most common type of chronic tonsillitis, with fibrotic patterns occurring less frequently.

Table 1: Distribution of cases according to age, gender, clinical diagnosis, and indications (*n*=296)

Parameter	Category	<i>n</i>	Percentage
Gender	Male	173	58.4
	Female	123	41.5
Age	12–20	144	48.6
	21–30	84	28.3
	31–40	42	14.1
	41–50	17	5.7
	51–60	9	3
Clinical diagnosis of the cases	Chronic tonsillitis	99	33.4
	Adenoid	154	52
	Chronic tonsillitis with adenoid	197	66.5
	Lymphadenitis	35	11.8
	Suspected malignancy	11	3.7
Indications	Hypertrophy of palatine and pharyngeal tonsils	197	66.5
	Recurrent infections	177	59.7
	Hypertrophy	67	22.6
	Sleep disordered breathing	43	14.5
	Asymmetric palatine tonsil	12	4
	Nasopharyngeal mass	9	3
	Lymphoma	1	0.3

Epithelial ulceration, microabscess formation, cryptitis, and interfollicular fibrosis have also been shown in some cases [Figures 1 and 2].

On histology, 99 subjects with enormously swollen tonsils (33.4%) had characteristics of chronic tonsillitis. The diagnosis was verified by the presence of fibrosis with characteristics of chronic tonsillitis, lymphoid hyperplasia, and mild to moderate lymphocyte infiltration in the surface epithelium [Figures 3 and 4].

In nine cases, the malignant specimen was found to be nasopharyngeal carcinoma. The non-keratinizing undifferentiated type of nasopharyngeal cancer was distinguished histologically by the presence of tumor cell clusters with vesicular nuclei, large central nucleoli, and an ambiguous cell boundary. Background lymphocytes and

plasma cells were often seen. P63 Immunohistochemistry verified their diagnosis [Figures 5 and 6a-c].

Only one instance of lymphoma has a combination of malignant lymphoid growth and reactive inflammatory alterations. Surface epithelial abnormalities, fibrosis, and persistent follicular hyperplasia are important discoveries [Figure 6d].

DISCUSSION

One of the most frequent surgical operations carried out worldwide is still tonsillectomy. It is debatable if all routine tonsil and adenoid specimens from otherwise healthy patients should be microscopically inspected. The primary goal of

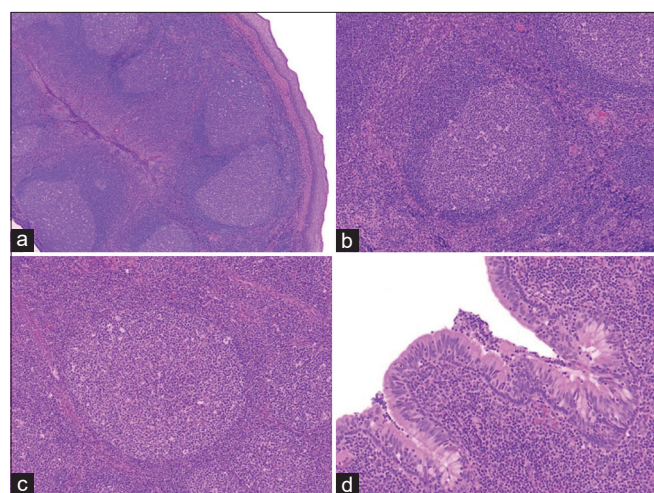


Figure 1: Different images of chronic tonsillitis and adenoid stained with Hematoxylin and Eosin (a and b: $\times 200$), (c and d: $\times 400$)

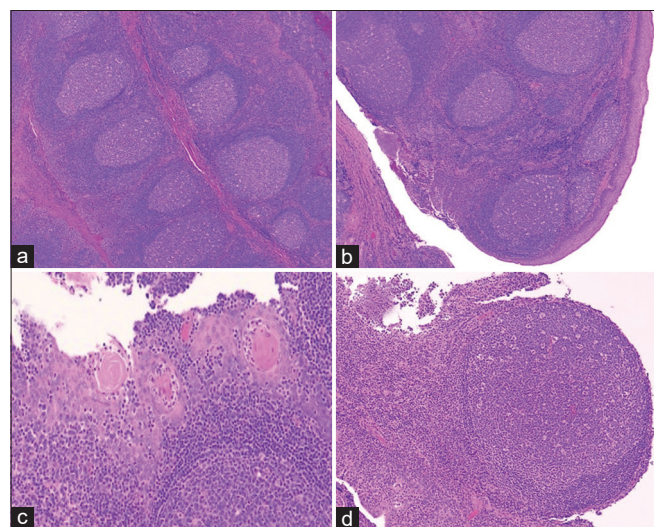


Figure 2: Different images of chronic tonsillitis and adenoid stained with Hematoxylin and Eosin (a and b: $\times 200$), (c and d: $\times 400$)

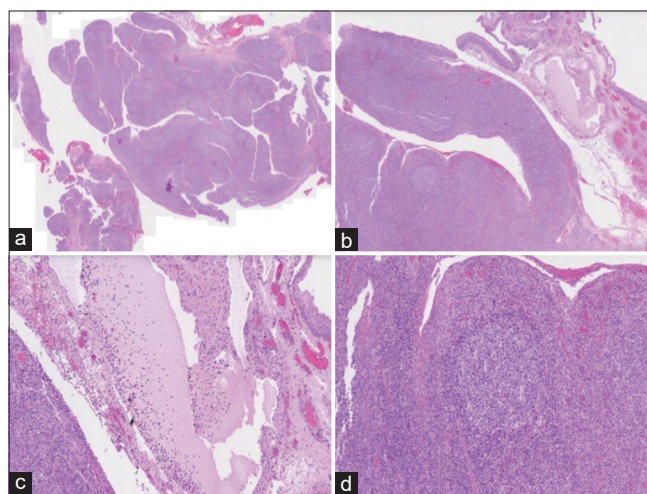


Figure 3: Different images of a 22-year-old male presented with huge enlarged tonsils, its diagnosis was chronic tonsillitis with reactive lymphoid hyperplasia with congested mucosa and dilated lymphatics (a and b: $\times 100$, c: $\times 200$, d: $\times 400$)

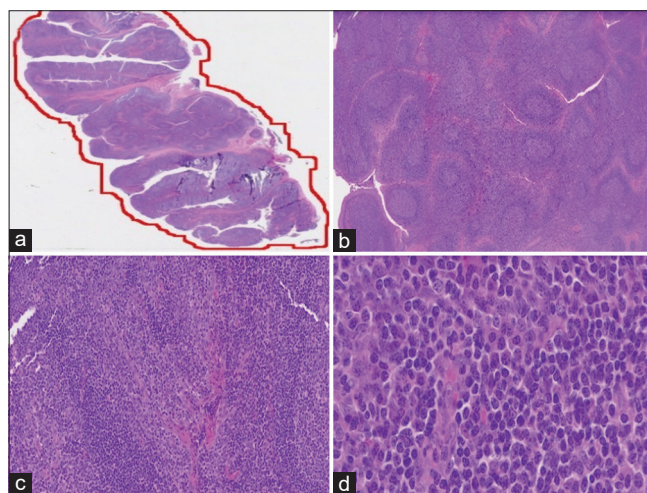


Figure 4: Different images of 13 years old female presented with enlarged tonsils show features of chronic tonsillitis with reactive lymphoid hyperplasia (a and b: $\times 100$, c: $\times 200$, d: $\times 400$)

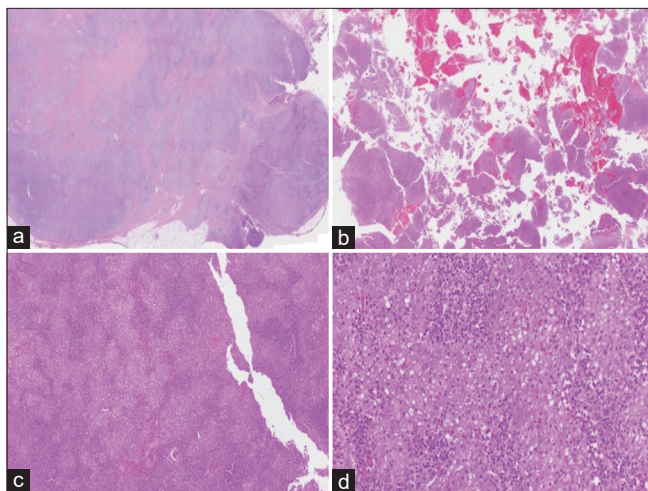


Figure 5: Different images of a 53-year-old male presented with a nasopharyngeal mass. Nasopharyngeal carcinoma confirmed by P63 Immunohistochemistry (a and b: $\times 100$, c: $\times 200$, d: $\times 400$)

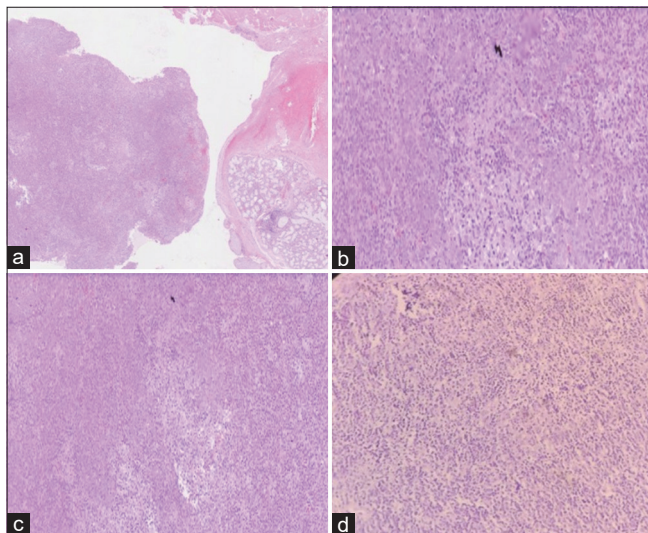


Figure 6: (a-c) Different images of a 51-year-old male presented with a nasopharyngeal mass. Nasopharyngeal carcinoma confirmed by P63 Immunohistochemistry. (d) A case of lymphoma shows lymphoid nodular pattern loss and sheets of neoplastic cells with effacement of nodal architecture, which are characteristics of a diffuse pattern lymphoma (a: $\times 100$, b-d: $\times 200$)

routine tonsillectomy specimen histological evaluation is to identify any unexpected diseases, including cancer. Numerous research findings demonstrate that, while not incredibly rare, the frequency of unexpected clinically significant tonsil disorders is modest.^[9,10] A number of alternatives to histological examination of tonsillectomy material have been put forth: No examination, selective histopathological study, or merely gross examination. According to some authors, a cursory examination of tonsil specimens might be sufficient. However, it is challenging or impossible to detect early lesions with only gross inspection due to deep fissures or crypts on the tonsils' surface. Patients who are clinically suspected

of having unique pre-operative symptoms or risk factors may additionally require microscopic histopathological diagnoses.^[11]

According to common wisdom, tonsillectomy samples must undergo histological investigation in order to effectively diagnose underlying diseases like malignancy or chronic inflammation.^[12]

According to our research, there is a slight but definite chance of cancer if there is no obvious tonsillar lesion or suspicious lymphadenopathy. The cost of routine histology is outweighed by the potential life-saving benefits of early cancer identification and rapid treatment. The lateral walls of the throat, which make up the majority of the so-called Waldeyer's ring of lymphatic tissue, contain the palatine tonsils. Non-keratinous stratified epithelium, an extension of oral pharyngeal tissue, covers them. The epithelium creates roughly thirty deep crypts that penetrate into the parenchyma, where lymph nodes and the germ centers that produce B-lymphocytes are located.

Nasopharyngeal carcinoma was identified as the malignant specimen in nine of the patients in our research. 400 tonsil specimens taken from 200 patients were retrospectively evaluated in a prior study. They discovered that 7.5% of the tissue was normal, 10.0% had acute or chronic tonsillitis, and 68.3% of the specimens had reactive lymphoid hyperplasia. There was only one instance of cancer found in one tonsil of a patient with asymmetric tonsils who smoked cigarettes. It was lymphoma.^[13] Another study released a retrospective analysis of 4070 patients who were 21 years of age or younger who had tonsillectomy and/or adenoidectomy at the University of Florida between 1970 and July 2001. Tonsils alone (15%), tonsils with adenoids (40%), and adenoids alone (45%) made up the specimens. Diagnoses that affected patient care, such as cancer and certain infections, were considered clinically significant. Normal tonsillitis, acute or chronic tonsillitis, and tonsillar hyperplasia were diagnoses that were not clinically noteworthy. Three of the 4070 individuals had tonsil or adenoid specimens with clinically significant disease processes.^[13]

CONCLUSION

In the elderly population, all tonsillectomy and/or adenoidectomy specimens must be sent for microscopic pathological analysis. In addition, materials from non-routine tonsillectomy and/or adenoidectomy children should be sent for microscopic pathological investigation if the medical history or physical examination reveals positive results. A pathologist's gross pathological assessment of regular tonsillectomy and/or adenoidectomy specimens is adequate for children who have no positive findings in their medical history or physical examination.

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AVAILABILITY OF DATA AND MATERIALS

The data are available on request from the authors.

ETHICS APPROVAL

All series of steps that were implemented in this study complied with Ethics Committee of Prince Sattam bin Abdulaziz University Institutional Review Board.

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