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Original Research Article

A study of the clinical profile of patients undergoing tonsillectomy with or without adenoidectomy

Mridima Chandra*, Ajeet Kumar Khilnani, Narendra Hirani, Rashmi Sorathiya, Khushboo Malhotra, Nijanshi Trapasia

Department of Otorhinolaryngology, Gujarat Adani Institute of Medical Sciences, Bhuj, Gujarat, India

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***Correspondence:**
Dr. Mridima Chandra,
E-mail: mridimachandra@gmail.com

ABSTRACT

Background: Tonsillectomy and adenoidectomy are among the most common otorhinolaryngological surgeries, indicated for recurrent tonsillitis, adeno-tonsillar hypertrophy, and obstructive sleep apnoea. Histopathological examination of excised specimens aids in confirming diagnosis and detecting rare pathology.
Methods: A prospective study was conducted at Gujarat Adani Institute of Medical Sciences, Bhuj, from June 2023 to November 2024. Seventy patients undergoing tonsillectomy and/or adenoidectomy were enrolled. Demographic profile, presenting symptoms, Brodsky grading, surgical details, and histopathological findings were analysed. Data were processed using SPSS v25.0.
Results: The majority of patients were adolescents (11-20 years, 37.1%) with a female predominance (55.7%). The predominant symptom was throat pain (95.7%), followed by mouth breathing and snoring (12.9% each). Most patients presented with grade 3 tonsillar hypertrophy (74.3%), and symptoms of 1-3 years' duration (71.4%). Bilateral tonsillectomy was the most common surgery performed (87.1%). Histopathological findings revealed chronic tonsillitis in 51.4% of cases, followed by chronic tonsillitis with actinomycetes (18.6%) and chronic lymphoid hyperplasia (15.7%). Rare findings included lymphoepithelial cysts (1.4%).
Conclusions: Chronic tonsillitis remains the leading indication for tonsillectomy, with strong correlation between clinical and histopathological features. Early recognition and surgical intervention yield favourable outcomes. Routine histopathology remains indispensable tool in excluding uncommon benign and malignant lesions.

Keywords: Adenoidectomy, Chronic tonsillitis, Histopathology, Obstructive sleep apnea, Tonsillectomy

INTRODUCTION

Tonsillectomy and adenoidectomy are among the most frequently performed otorhinolaryngological procedures worldwide, particularly in children and adolescents, where adeno-tonsillar hypertrophy and recurrent infections are common.[1] These surgeries are primarily indicated for recurrent tonsillitis, chronic adeno-tonsillar hypertrophy, and obstructive sleep apnea (OSA). Despite the widespread use of antibiotics and improvements in medical therapy, surgical management remains the treatment of choice for patients who fail conservative measures or present with significant airway obstruction, sleep disturbance, or recurrent infections.[1]

The tonsils and adenoids form an integral part of Waldeyer's ring and play a crucial role in the mucosal immune system by trapping and processing antigens entering through the upper aerodigestive tract.[2] Adeno-tonsillar hypertrophy has been identified as the leading cause of pediatric obstructive sleep apnea, accounting for the majority of cases seen in otolaryngology practice.[2] The pathophysiology involves mechanical obstruction of the upper airway during sleep, resulting in intermittent hypoxia, hypercapnia, and sleep fragmentation, which can adversely affect growth, behavior, and cardiovascular health. Recurrent tonsillitis remains another major indication for tonsillectomy. According to the updated Clinical Practice Guideline issued by the American

Academy of Otolaryngology-Head and Neck Surgery Foundation, tonsillectomy is recommended in children who experience frequent episodes of throat infection-defined as seven or more episodes in the past year, five per year for two consecutive years, or three per year for three consecutive years- with accompanying clinical features such as fever, cervical lymphadenopathy, and tonsillar exudate.[1] Chronic infection leads to repeated antigenic stimulation of the tonsillar crypts, resulting in persistent inflammation and fibrosis.[3]

Histopathological examination plays a vital role in confirming the diagnosis of chronic tonsillitis and identifying rare or unsuspected conditions. Ugras proposed histopathological criteria for chronic tonsillitis, including lymphocytic infiltration, the presence of Ugras abscesses, epithelial defects, fibrosis, and follicular hyperplasia.[3] These microscopic findings support the clinical diagnosis and provide evidence of long-standing inflammation. Furthermore, studies have emphasized that although most tonsillar specimens reveal benign inflammatory pathology, routine histopathological analysis remains essential to rule out uncommon but potentially serious lesions such as actinomycosis or lymphoma.[4-6]

Several regional and international studies have assessed the clinical profile of tonsillectomy patients and highlighted variations in demographic distribution and symptomatology.[4,5,7] Najoan et al reported a predominance of tonsillar disease in children and adolescents, mirroring the natural peak of lymphoid hyperplasia during these years.[4] Kokong et al, in a study on African children, also observed that tonsillar hypertrophy is more common in younger age groups and contributes significantly to upper airway obstruction and sleep-disordered breathing.[5] Similarly, Sharma et al, in their microbiological study, demonstrated that chronic tonsillitis is often associated with polymicrobial colonization, reinforcing the role of chronic infection in disease persistence and recurrence.[7]

The present study was therefore undertaken to evaluate the demographic, clinical, and histopathological correlation among patients undergoing tonsillectomy and/or adenoidectomy at a tertiary care centre in western India.

By correlating clinical findings with surgical and histopathological outcomes, this study aimed to reinforce the continued relevance of adenotonsillectomy as an effective and safe procedure, and to emphasize the indispensability of routine histopathological evaluation in excluding rare but clinically significant pathology.

METHODS

This was a prospective study conducted over a period from June 2023 to November 2024. It included patients who presented to the ENT outpatient department (OPD) with complaints related to tonsillar and adenoid conditions at Gujarat Adani Institute of Medical Sciences (GAIMS), Gujarat. Ethical approval was obtained from the institutional ethics committee, GAIMS, Bhuj (Protocol no-IEC/RESCH/2023/53).

Written informed consent was taken from all participants/guardians. After considering a 10% non-response rate, the final sample size was determined to be 70 patients. Participants were recruited using simple random sampling from those who presented to the ENT OPD with tonsillar and adenoid complaints. Eligible patients undergoing tonsillectomy and/or adenoidectomy were included after obtaining informed consent.

Inclusion criteria were all patients who underwent tonsillectomy and/or adenoidectomy at GAIMS. Exclusion criteria were patients who were unwilling to participate in the study and cases where tonsillectomy was performed as a surgical approach for other procedures.

Routine preoperative investigations were conducted as per institutional protocols. Patients underwent tonsillectomy and/or adenoidectomy as per standard surgical guidelines. Postoperative follow-up was conducted at 7 days, 15 days, and 30 days post-surgery. Clinical history, examination, Brodsky grading, ENT findings, surgical procedures, and histopathological examination were recorded for each patient. The study employed an appropriate methodology for data analysis.

Statistical analysis

The data collected for the study were systematically entered into a Microsoft Excel spreadsheet and subsequently analysed using the Statistical Package for Social Sciences (SPSS), version 25.0 (IBM Corp., Chicago, USA). Categorical variables were expressed as numbers and percentages (%), whereas quantitative data were presented as means ± standard deviation (SD). The normality of the data was assessed using the Shapiro-Wilk test. For statistical comparisons, appropriate tests were applied based on the nature of the variables. Quantitative variables were analysed using the independent t-test to assess differences between groups. For qualitative (categorical) variables, the Chi-square test was employed. In instances where any expected cell value was less than 5, Fisher's Exact test was used to ensure accurate analysis.

RESULTS

Demographics

In the present study, majority patients were aged 11-20 years (37.1%), followed by 1-10 years (27.1%); slight female predominance (55.7%) as shown in Table 1.

Table 1: Demographic profile of patients.

Age group (years)	Female	Percentage	Male	Percentage	Total	Percentage
1-10	9	12.85	10	14.28	19	27.14
11-20	15	21.42	11	15.71	26	37.14
21-30	9	12.85	6	8.57	15	21.43
31-40	6	8.57	3	4.28	9	12.86
41-50	1	1.43	0	0	1	1.43

Symptoms

Throat pain (95.7%) was the most common symptom in present study followed by mouth breathing (12.9%) and snoring (12.9%) as shown in Table 2.

Table 2: Distribution of patients according to symptoms.

Symptoms	Frequency	Percentage
Throat pain	67	95.7
Mouth breathing	9	12.9
Snoring	9	12.9

Examination

In the present study, Brodsky grade 3 tonsillar hypertrophy found in 74.3%; grade 2 hypertrophy (14.29%), grade 4 (10%). Serous otitis media (7.1%) and tympanic membrane perforation (10%). Brodsky grading is shown in Table 3.

Table 3: Grading of tonsillar enlargement (Brodsky classification).

Category	Count	Percentage
Grade 1	0	0.00
Grade 2	10	14.29
Grade 3	52	74.29
Grade 4	8	11.43
Total	70	100

Surgical profile

In the present study, bilateral tonsillectomy (87.1%) was the most frequent surgical intervention followed by adenotonsillectomy (8.6%) and adenoidectomy alone (4.3%).

Table 4: Correlation of HPE findings with age.

Histopathological findings	0-10 years	11-20 years	21-30 years	31-40 years	41-50 years	P value (independent t-test)
Benign hyperplastic adenoid	3 (15.79)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0.12
Chronic adeno-tonsillitis	5 (26.32)	1 (3.85)	0 (0.00)	0 (0.00)	0 (0.00)	0.08
Chronic lymphoid hyperplasia	2 (10.53)	6 (23.08)	2 (13.33)	1 (11.11)	0 (0.00)	0.86
Chronic tonsillitis	6 (31.85)	16 (61.54)	7 (46.67)	6 (66.67)	1 (100.00)	0.70
Chronic tonsillitis with actinomycetes	3 (15.79)	3 (11.54)	6 (40.00)	1 (11.11)	0 (0.00)	0.45

Table 5: Correlation of HPE findings with gender.

Histopathological finding	Female	Male	P value
Benign hyperplastic adenoid	1 (2.5)	2 (6.67)	0.15
Chronic adeno-tonsillitis	3 (7.5)	3 (10)	1.00
Chronic lymphoid hyperplasia	7 (17.5)	4 (13.33)	0.08
Chronic tonsillitis	20 (50.00)	16 (53.33)	0.07
Chronic tonsillitis with actinomycetes	8 (20.0)	5 (16.67)	0.08

Histopathology

All excised specimens were sent for histopathological examinations. Table (5) shows histopathological findings. Maximum patients showed chronic tonsillitis (51.4%), chronic tonsillitis with actinomycetes (18.6%), chronic lymphoid hyperplasia (15.7%), chronic adeno-tonsillitis (8.6%), benign adenoidal hyperplasia (4.3%), lymphoepithelial cyst (1.4%). Tables 4 and 5 show the correlation of HPE findings with age and gender respectively.

DISCUSSION

The present study evaluates the clinical, surgical, and histopathological correlation in patients undergoing tonsillectomy and/or adenoidectomy at a tertiary care centre in western India. Our findings corroborate earlier studies demonstrating that chronic tonsillitis remains the most common indication for tonsil surgery, particularly among children and adolescents.

Demographic and clinical correlation

The age distribution in this study showed a predominance of the 11-20 years group (37.1%), followed by 1-10 years (27.1%). This finding is consistent with Kokong et al and Najoan et al, who also reported that tonsillar and adenoidal hypertrophy is most frequent in children and adolescents due to heightened lymphoid activity during these years.[4,5] The slight female predominance (55.7%) observed contrasts with some earlier studies that reported male predominance, suggesting that demographic variations may be influenced by local environmental and genetic factors.[5,7]

Throat pain was the predominant symptom (95.7%), followed by mouth breathing and snoring (12.9% each). This aligns with Ugras, who noted that recurrent throat pain is the most reliable clinical predictor of chronic tonsillitis.[3] Mouth breathing and snoring reflect upper airway obstruction secondary to adeno-tonsillar hypertrophy, as emphasized in studies by Cassano et al and Fageeh et al.[2,6]

Tonsillar grading and surgical profile

Grade 3 hypertrophy was the most common (74.3%), consistent with Brodsky's classification findings in similar pediatric populations.[6] Such hypertrophy significantly narrows the oropharyngeal airway, predisposing to obstructive sleep apnea (OSA) and dysphagia. The high proportion of bilateral tonsillectomies (87.1%) observed reflects the predominance of symmetrical disease presentation, which has been similarly reported in African and Asian cohorts.[5,7]

The surgical pattern observed- tonsillectomy alone in most cases- may be attributed to the relatively lower incidence of isolated adenoidal hypertrophy among older children and adolescents. In contrast, adenoidectomy tends to dominate in younger children due to the anatomic predilection of adenoidal hypertrophy for earlier ages.[1]

Histopathological correlation

Histopathological evaluation confirmed chronic tonsillitis in 51.4% of specimens, followed by chronic tonsillitis with actinomycetes (18.6%) and chronic lymphoid hyperplasia (15.7%). These results closely mirror those of Ugras and Sharma et al, reinforcing that chronic inflammation with lymphoid hyperplasia remains the hallmark of adeno-tonsillar disease.[3,7]

Actinomycetes colonization, observed in nearly one-fifth of cases, is of particular note. Although often considered commensal, their histological presence may reflect chronic bacterial colonization within tonsillar crypts, as reported by Sebeih et al.[8] Routine histopathological examination thus holds value not only for diagnostic confirmation but also for identifying rare or unexpected pathologies such as actinomycosis, lymphoepithelial cysts, and, occasionally, lymphoma.[5,9]

Comparison with published literature

The clinical-histopathological correlation in this study supports prior evidence that chronic tonsillitis, though primarily a clinical diagnosis, has a strong pathological basis characterized by epithelial infiltration with lymphocytes and plasma cells, follicular hyperplasia, and fibrosis.[3] The detection of actinomycetes in 18.6% of cases aligns with previous microbiological reports from India and the middle east, where poor oral hygiene and repeated infections may facilitate microbial persistence.[2,7]

Our study also supports routine histopathological screening, even when clinical findings appear benign. Studies by Kokong et al.[5] and Najoan et al.[4] have documented incidental detection of neoplastic and premalignant changes in apparently inflammatory tonsils.[4,5] The identification of a lymphoepithelial cyst (1.4%) in our series further underscores this recommendation.

Clinical implications and outcomes

The high prevalence of Brodsky grade 3 tonsils and prolonged symptom duration (1-3 years in 71.4%) indicate delayed intervention, often due to underestimation of symptom burden or preference for conservative management. Early surgical referral may improve airway and infection-related morbidity.[1,9]

Postoperative outcomes in similar series, including Sebeih et al and Fageeh et al, demonstrate significant improvement in quality of life, sleep, and growth parameters after adenotonsillectomy, supporting the long-standing role of surgery as definitive treatment when indicated.[2,8]

Limitations of this study are: it was single centred study with limited sample size, short follow-up duration (30 days). Lack of polysomnography for OSA evaluation.

CONCLUSION

This study evaluated the clinical, demographic, surgical, and histopathological profiles of patients undergoing tonsillectomy and adenoidectomy procedures. The

findings demonstrated that tonsillar and adenoidal pathologies were more prevalent among younger age groups, particularly adolescents and children, with a female predominance observed in most age brackets. The majority of patients presented with a short history of symptoms, primarily throat pain, highlighting chronic or recurrent tonsillitis as the leading indication for surgical intervention.

Bilateral tonsillectomy emerged as the most frequently performed procedure, followed by tonsil-adenoid resection and adenoidectomy. Ear and nasal examinations revealed that while the majority of patients had normal findings, a subset exhibited associated conditions such as tympanic membrane perforations, serous otitis media, and deviated nasal septum- further emphasizing the potential systemic impact of upper airway pathologies.

Histopathological analysis confirmed chronic tonsillitis as the predominant diagnosis, with notable cases of chronic tonsillitis with actinomycetes, chronic lymphoid hyperplasia, and chronic adeno-tonsillitis. These findings underscore the role of persistent infection and immune stimulation in tonsillar disease. Additionally, age and sex-wise distribution patterns highlighted chronic tonsillitis as a common pathology across all subgroups, reinforcing its universal nature.

Overall, the study underscored the importance of early diagnosis and timely surgical intervention in managing tonsillar and adenoidal diseases. The clinical and pathological correlation further supports the continued relevance of histopathological evaluation in guiding treatment and identifying potential complications. Tonsil and adenoid histopathological findings are indispensable in diagnosing and managing rare conditions like lymphoma, lymphoepithelial cyst and other benign and malignant disorders.

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