

Clinicopathologic analysis of tonsillectomy tissues in a tertiary health centre in Benin City, Nigeria

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Abstract

Background: Tonsillectomy is a common surgical procedure in otorhinolaryngology, indications for which should be met before surgery. To subject tonsillectomy tissue specimen to histologic analysis has become an issue of debate in recent times, thus necessitating a review of tonsillectomy tissues at the University of Benin Teaching Hospital (UBTH), Benin City, Nigeria.

Aim: The aim of this study is to determine the indications for tonsillectomy and relevance of histologic diagnosis of tonsillectomy tissue specimen.

Methods: A 5-year retrospective study; January 2010–December 2014 of tonsillectomy tissue specimens received in the Department of Pathology of UBTH were evaluated with regard to patients' clinical information and histologic diagnosis.

Results: A total of 224 patients with M: F ratio of 1.2:1 was reviewed. Obstructive airway disease was the most common indication for surgery; 167 (73.2%), whereas the predominant histologic diagnosis was reactive lymphoid hyperplasia; 219 (97.8%). Five (2.2%) of the tissue specimens showed features of malignancy.

Conclusion: The most common indication for tonsillectomy was obstructive airway disease. Although the majority of tissue specimens revealed benign features, the recorded number of the malignant specimen was quite considerable. Thus, there is the need to subject all tonsillectomy tissues to histologic analysis.

Keywords: Analysis, clinicopathologic, tertiary centre, tonsillectomy tissue

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INTRODUCTION

The tonsils are a pair of lymphoid tissues located at the lateral wall of the oropharynx. Alongside other lymphoid tissues, they form a ring of gut-associated lymphoid tissues known as the Waldeyer's ring.^{1,2} Lymphatic efferents leave these tissues and drain to the regional lymph nodes of the neck. They help to protect the upper aerodigestive tract from invading microorganisms by the way of exerting immunologic response. However, these tissues may

become hypertrophied as a result of repeated infection from pathogenic organisms, as well as from response to allergens.^{3,4} Hypertrophied tonsils are more common in children between the ages of 3 and 7 years when the tonsillar and adenoid lymphoid tissues are disproportionately large relative to the pharyngeal airway.⁵ Thus, they are prone to developing symptoms of the obstructive airway; snoring, obstructive sleep apnoea (OSA).⁶ OSA has a prevalence of 2% in paediatric population and this is more common in the African child.^{5,7}

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In adults, the tonsils may become a nidus for recurrent infection, being a reservoir for bacterial pathogens; Group A beta-haemolytic streptococcus.⁸ The presence of unilateral tonsillomegaly or an ulcer crater on a tonsil is considered an ominous sign of malignancy.⁹

Tonsillectomy is performed only when indications are met, and these include as follows: obstructive symptoms as occur mainly in obstructive airway disease, chronic tonsillitis (recurrent sore throat of five or more episodes per year), post-Quinsy and suspicion of malignancy as is the case for asymmetric tonsil.^{10,11} It is a common surgical procedure done in the paediatric population.^{10,12} The internationally acceptable and evidence-based indication for tonsillectomy was described by the Scottish Intercollegiate Guidelines Network;¹⁰ whereby patients should meet the following criteria; (i) sore throat should be due to tonsillitis (ii) five or more episodes of a sore throat per year (iii) symptoms for at least 1 year (iv) episodes should be disabling and prevent normal function. The American Academy of Otolaryngology-Head and Neck Surgery equally has a similar guideline that is based on clinical features of sore throat, in addition to one of the following episodes of (i) temperature $>38.3^{\circ}\text{C}$ (ii) cervical lymphadenopathy (iii) tonsillar exudate (iv) culture positive Group A beta-haemolytic streptococcus.¹³ The Paradise criteria, on the other hand, consider the minimum frequency of a sore throat per episode; at least seven episodes in the previous year; at least five episodes in each year of the previous 2 years; or at least three episodes in each year of the previous 3 years.¹³ At the University of Benin Teaching Hospital (UBTH), the criteria used to determine candidates' suitability for surgery include; obstructive symptoms from tonsillar hypertrophy (snoring and OSA), recurrent episodes of a sore throat >5 episodes in a year with an associated fever, school and work deprivation.

As standard protocol, surgical practice in many climes entail that all tonsillectomy tissue specimen should be evaluated by the pathologist to determine a histologic diagnosis in line with global best practices.¹⁴⁻¹⁷ This is borne out of the fact that unless all tissue specimen are examined histologically, a rare case of a clinically significant disease like malignancy might be missed and this could result in litigation. It is still in contest whether or not to subject every tonsillectomy tissue specimen to histologic evaluation, because most of the surgeries are performed in children with less propensity for malignancy.¹⁸⁻²¹ It is also believed that the outcome of tissue histology does not contribute to the surgical management of tonsillitis in children.^{19,20}

The aim of this study, therefore, was to highlight the indications for tonsillectomy at the UBTH, and to

determine the relevance of subjecting tonsillectomy tissues to histopathologic diagnosis.

METHODS

A 5-year descriptive retrospective study was carried out on the clinical records of consecutive patients who underwent tonsillectomy alone or in combination with adenoidectomy between January 2010 and December 2014 at UBTH. A total of 224 patients who met the inclusion criteria had their case notes reviewed devoid of berry picking. The inclusion criteria were as follows: patients with strong enough indication for tonsillectomy, and those with complete data. The exclusion criteria were as follows: patients not fit for surgery, patients with unilateral tonsillomegaly, and those with incomplete data. Tonsillectomy was done for all patients using 'cold steel' dissection in the operating theatre, under general anaesthesia through endotracheal intubation [Figure 1]. Surgical tissue specimens were immediately fixed in 10% formaldehyde. They were sent to the pathology department within 24 h for histologic analysis. At the histopathology laboratory, specimens were embedded in paraffin and cut into thin sections of about 2–3 μm with a microtome and stained routinely with haematoxylin and eosin using standard operating procedures that apply to Nigerian laboratories that are ISO compliant. Slides were viewed under light microscopy by pathologists (residents and consultants) that are usually not <2 in most cases, and controversial cases were sent outside for the second opinion. It is imperative to state that over the years, the laboratory staffing has not changed. Thus the laboratory expertise was maintained. The WHO classification of tumours was used for malignant cases.

Patients' bio-data included: age, sex, indications for tonsillectomy and histologic diagnosis of tissue specimen were collated and analysed using statistical package for social sciences (SPSS) Version 20.0 Armonk, NY: IBM Corp, and results presented in tables. Categorical data were analysed using Chi-square. A value of $P < 0.05$ was considered as statistically significant.

RESULTS

A total of 224 patients (M: F ratio 1.2:1) with complete clinical details out of the 228 who had surgery within the period under review were studied. The age range was 0.75–87 years, and a mean age of 11.24 ± 1.41 years [Table 1]. The highest rate of tonsillectomy was amongst the paediatric age group, with obstructive airway disease being the most common indication for surgery; 167 (74.6%). Histopathologic analysis revealed reactive lymphoid

hyperplasia as the predominant diagnosis 219 (97.8%), while various categories of malignancy were found in 5 (2.2%) tissue specimens [Table 3]. There was a statistically significant association between the age group of patients and the histologic diagnosis; $P = 0.003$ [Table 3].

DISCUSSION

In this study, the major indication for tonsillectomy was obstructive airway disease in children; 167 (74.6%) [Table 4]. This was similar to the study by Ibekwe *et al.*¹² and Alfredo *et al.*,² where same accounted for 86 (63.7%) and 2360 (94.4%) respectively. There was a marginal male preponderance; 1.2:1. The reason behind this could not be explained. However, studies revealed

that tonsillectomy is performed more in males in the first decade of life.^{22,23}

Reactive lymphoid hyperplasia was the predominant histologic diagnosis; 219 (97.8%) [Table 2]. Previous studies by Ikram *et al.*²⁴ and Alfredo *et al.*² also found a high proportion of tonsillectomy tissues to be of reactive lymphoid hyperplasia [Figure 2]; 137 (68.3%) and 205 (82%), respectively. Obstructive symptoms are now the primary indication for tonsillectomy the world over. This is, however, a recent shift in trend. Thirty years back, 70% of tonsillectomy were done for infective reasons; recurrent (chronic tonsillitis). Today, about 20% are done for recurrent tonsillitis. This may be attributed to the fact that with the advent of antibiotics, the rate of infection has been on a steady decline and therefore the number of tonsillectomies performed.²⁵ Airway obstruction from hypertrophied tonsils, on the other hand, was proportionally higher in younger children, while the infection was proportionally higher in older children and in adults.²⁶ This may also be ascribed to disproportionately large tonsillar tissues relative to the pharyngeal airway in children.⁵ The place of an immunological response to allergens in children is also a factor to consider.^{4,27}

Majority of the study population were in the paediatric age bracket, with low risk of malignancy.^{18,24} In this index study, the prevalence of malignancy was 5 (2.2%), compared to other studies where the prevalence of malignancy was 2 (0.82%)²⁸ and (0%–0.18%)^{18,29,30} respectively. Among the five recorded cases of malignancy, one was squamous cell carcinoma [Figure 3], two squamous dysplasia, one adenocarcinoma and one neuroendocrine carcinoma. There was, however, a male predilection; 4 (80%) [Table 2].

It is noteworthy that there was a near equal distribution of malignancy among the paediatric and adult population; 3 (60%) and 2 (40%) respectively. The reason behind this is not far-fetched. Even though the majority of the study population was the paediatric age group [Table 3], it is believed that tonsillar malignancy is low in children as compared to adults who are more exposed to the risk factors of malignancy; family history of cancer, increasing age, tobacco and alcohol synergism, human papilloma virus infection, HIV and AIDS, weight loss and cervical lymphadenopathy.^{31,32} The association between the age of patients and the histologic diagnosis was thus statistically significant [Table 3].

The relevance of routine histologic diagnosis remains a thing of debate. For some schools of thought, it is considered a necessity so as not to miss unexpected

Table 1: Age distribution

Age range	Frequency (%)
0-9	159 (71.0)
10-19	22 (9.8)
20-29	18 (8.0)
30-39	17 (7.7)
40-49	4 (1.8)
50-59	1 (0.4)
60-69	1 (0.4)
70-79	0
80-89	2 (0.9)
Total	224 (100)

Table 2: Sex distribution of histologic diagnosis of tonsillectomy tissues

Diagnosis	Sex		Total
	Male	Female	
Reactive lymphoid hyperplasia	118	101	219
Neoplastic	4	1	5
Total	122	102	224

Table 3: Age distribution of histologic diagnosis of tonsillectomy tissues

Age	Histology		Total	χ^2	P
	Lymphoid reactive hyperplasia	Malignancy			
0-9	157 (70.0)	2 (1.0)	159 (71.0)	67.759	0.003*
10-19	21 (9.4)	1 (0.4)	22 (9.8)		
20-29	18 (8.0)	0 (0.0)	18 (8.0)		
30-39	16 (7.1)	1 (0.4)	17 (7.5)		
40-49	4 (1.8)	0 (0.0)	4 (1.8)		
50-59	1 (0.5)	0 (0.0)	1 (0.5)		
60-69	1 (0.5)	0 (0.0)	1 (0.5)		
70-79	0 (0.0)	0 (0.0)	0 (0.0)		
80-89	1 (0.5)	1 (0.4)	2 (0.9)		
Total	219 (97.8)	5 (2.2)	224 (100)		

*Significant

Table 4: Indications for tonsillectomy

Indication	Frequency (%)
Obstructive airway disease	167 (74.6)
Chronic tonsillitis	57 (25.4)

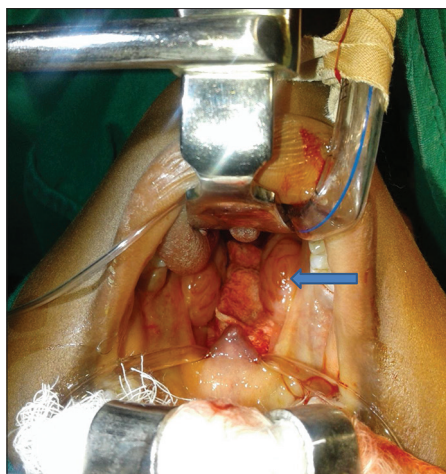


Figure 1: Patient under general anaesthesia for 'cold steel' Tonsillectomy. Solid arrow = hypertrophied tonsil

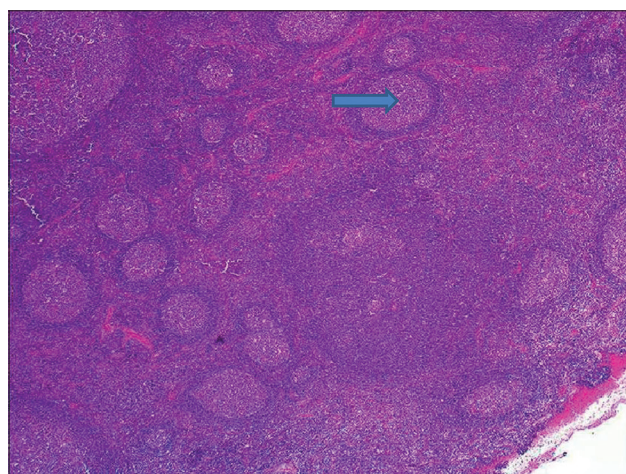


Figure 2: Photomicrograph of reactive lymphoid hyperplasia of tonsil. Solid arrow shows hyperplastic lymphoid follicles

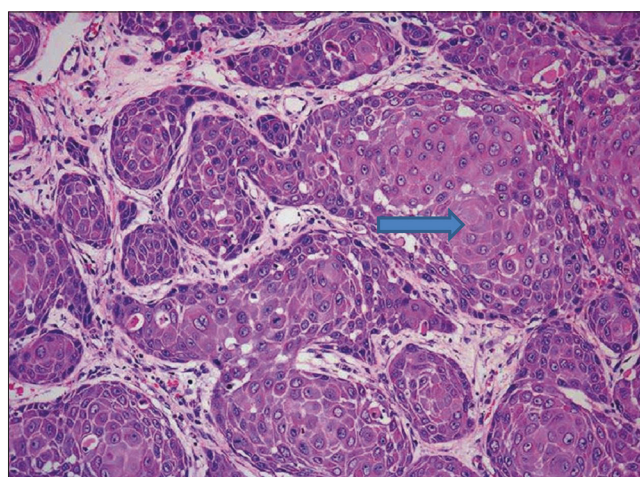


Figure 3: Photomicrograph of Squamous cell carcinoma of tonsil. Solid arrow shows well differentiated cells

malignancy,^{3,14-17,33,34} while for others, it is not worth the while because the incidence of malignancy in tonsillectomy

tissues has been found to be negligible.¹⁸⁻²¹ It is advocated that patients should be treated according to individual peculiarities, as those at risk of having malignant tonsils based on history and clinical examination should have their tissues subjected to histologic analysis.¹⁸

In our center, UBTH, it is routine that all tonsillectomy tissue specimens are sent for histopathologic analysis. This is also applicable to other surgical tissue specimens, as the cost of histopathologic analysis is incorporated into the cost of surgery. A point of argument by proponents who object to routine histologic analysis of tonsillar tissues is the extra financial burden on patients, especially in resource poor economy;^{35,36} where health insurance coverage is limited and the majority of patients pay out of their pocket. The risk of missing an asymptomatic malignant condition could be of greater burden on both patients and hospital, if only selected tissue specimens are sent for histologic analysis.

The inability to closely follow up patients whose tonsillar tissue specimen revealed histologic evidence of malignancy was a limitation of this study. In this regard, there is room for future prospective based research.

CONCLUSION

Obstructive airway disease was the most common indication for tonsillectomy. Although the majority of the tissue specimen revealed histologic benign features, the number of malignant tissues was disturbing. The authors, therefore, consider it a necessity that all tonsillectomy tissue specimens be subjected to routine histologic analysis irrespective of the presence or absence of risk factors for malignancy.

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Conflicts of interest

There are no conflicts of interest.

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