Histological study of routine tonsillectomy specimen

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Published online: 9 November 2008

Abstract

Introduction Palatine and nasopharyngeal tonsils are lymphatic flesh clusters of tissue of the respiratory and digestive tract's epithelium. There is not much literature pertaining to the histological assessment of resected tonsils though anecdotal case reports of choristoma, squamous cell cysts of the tonsil have been reported which mimicked chronic tonsillitis. Tonsils also are an important site for head and neck cancer in adults.

Aim & objective To study the histological features of routine tonsillectomy specimens and to study for the presence of choristomatic tissue or any other benign pathology as a cause of chronic tonsillitis.

Patients & methods Fifty consecutive tonsillectomy specimens, which were received in the department of Pathology, Gandhi Medical College, were evaluated with regards to clinical information. Among 50 patients, a slight predominance of men (56 %) over women (44 %) was observed.

Conclusion The mesenchymal tissue consisted mainly of epithelium and lymphoid tissue with cartilage in a single case and fat in three cases. The role of imaging techniques, in assessing the need for early surgical intervention in cases with chronic tonsillitis, can be determined by assessing the micropathology of tonsillectomy specimens and is an arena

for further research. We discussed the role of FDG-PET scan in the assessment of the same.

Keywords Histology · Tonsillectomy

Introduction

Inspection of tonsils forms a part of routine physical examination and tonsillectomy is a regularly performed surgery. The usual indication for surgical resection of tonsils is hyperplastic chronic tonsillitis.

There is not much literature pertaining to the histological assessment of resected tonsils. Literature also does not indicate the reason behind the fact that only part of the population suffers from recurrent chronic tonsillitis in spite being exposed to similar conditions.

This study was designed to evaluate histology and the presence and proportion of choristomatic mesenchymal tissue, in the resected tonsillar specimen. This assessment is important because it might give a clue to a possible etiology for recurrent chronic tonsillitis. This study was also taken up to evaluate the cost effectiveness of performing histopathology of the resected tissue in patients with recurrent and chronic tonsillitis.

Although there exists a defined criterion for surgical removal of the tonsils based on the number of attacks per year but it leads to a considerable morbidity and suffering for the patient as the criteria needs to be fulfilled before the decision for surgical excision is taken. The possible role of any imaging modality, which would indicate the histological picture predisposing to chronic tonsillitis indicating early surgery, remains to be evaluated.

Aims and objectives

To study the histological features of routine tonsillectomy specimens. To study for the presence of mesenchymal

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choristomatic tissue or any other benign pathology as a cause of chronic tonsillitis. To discuss the role of imaging techniques in diagnosis as a literature review.

Materials and methods

Fifty consecutive tonsillectomy specimens, which were received in the Department of Pathology Gandhi Medical College, were evaluated with regards to clinical information after obtaining approval from the college ethical committee. Simultaneously after buffered formalin fixation and routine processing of the tissue, 2–3 micron thick sections were taken and stained with Hematoxyline and Eosin. The sections were examined histopathologically with special reference to the presence and amount of mesenchymal tissue, which was noted and grouped as focal, multifocal and abundant.

Table 1 Age wise distribution of cases

Age (in yrs)	No. of Cases	Percentage
0–10	1	2
11–20	21	42
21–30	15	30
31–40	6	12
41–50	1	2
51–60	2	4
61–70	2	4
71–80	2	4

Table 2 Sex wise distribution of cases

Sex	No. of Cases	Percentage
Male	28	56
Female	22	44

Male to Female ratio were according to their ratio in population of the area.

Table 3 Clinical diagnosis of the cases

Clinical Diagnosis	No. of Cases	Percentage
Chronic Tonsillitis	31	62
Chronic Hyperplastic Lymphadenitis	1	2
Chronic Tonsillitis with Adenoid Hypertrophy	3	6
Suspected Malignancy	7	14
Tonsillar Cyst	6	12
Tonsillar Growth (non specific)	2	4

Table 4a. Mesenchymal elements in the tonsillar histopathology

Mesenchymal Element	No. of Cases	Percentage
Epithelium	45	90
Lymphoid Tissue	49	98
Mucous Glands	41	82
Capsule	41	82
Skeletal Muscle	24	48
Cartilage	1	2
Fat	3	6

Table 4b. Amount of the tissue

	Focal	Multi-focal	Abundant
Mucous Gland	9	22	11
Skeletal Muscle	16	02	06

Observations

The age group of 11–20 years showed the maximum number of tonsillectomy specimen. Smallest numbers of specimen were in the group 0–10 and 41–50 years of age.

The maximum number of cases was clinically diagnosed as chronic tonsillitis.

Besides the normal tonsillar micro morphological elements (epithelium, lymphoid tissue and capsule) the largest fraction was of mucus glands. Cartilage and fat were the dominant mesenchymal choristomatic tissue. Mucus glands when found were abundant or multifocal but skeletal muscle was more focal in its presence.

Discussion

This study was initiated with the aim of evaluating less examined but commonly occurring problem of chronic tonsillitis. As such the tonsillar histopathology is a less explored area and an insight in to its problems need more studies.

Palatine and nasopharyngeal tonsils are lymphatic flesh clusters of tissue of the respiratory and digestive tract's epithelium [1, 2]. The palatine tonsils are present in the lateral walls of throat that compose the bulk of the so-called Waldeyer's ring of lymphatic tissue [1]. They are covered by non-keratinous stratified epithelium, which is an extension of the oral pharyngeal tissue. The epithelium forms about 30 deep crypts that invaginate into the parenchyma, in which lymph nodes are found with the germ centers responsible for B-lymphocyte production [1, 3]. In addition to nodes, debris of epithelial cells desquamations, alive and dead lymphocytes, as well as bacterium may be present in the crypts. In cases of acute tonsillitis, collection of pus may be observed [4]. The tonsils are enclosed by fibrous

and dense capsule, separating them from a deeper connective tissue [1, 2]. Tonsils originate from the second pair of pharyngeal pouches, where endodermis bears the covering epithelium and mesenchymal structure gives origin to the lymphoid tissue [5]. In younger age group recurrent and chronic tonsillitis is very common [6]. Malignancy of tonsils is also not very uncommon. Age adjusted incidence rate of carcinoma of the tonsil in Bhopal is 1.80/100000 population in males and 0.20/100000 population in females in the year 2003 [7].

Recurrent and chronic tonsillitis leads to hyperplasia of the tissue and the treatment given is surgical removal of tonsils, but there is little information about the histopathological findings in a tonsillectomy specimen both in pathology textbooks and in the literature [8].

Chronic tonsillitis does not only cause man day loss but it may lead to other more serious illnesses like IgA Nephropathy which is induced by abnormalities of CD4+, CD25+, Treg cells in the tonsils [9].

Dell' Aringa [10] et al performed a retrospective clinical study based on the revision of medical records of patients who underwent tonsillectomy and adenoidectomy in the period between January 2001 and May 2003. Analysis of patients' profile and main pathological changes in 250 patients with palatine tonsil hypertrophy, recurrent infections or both was made. A histological review of 250 patients who underwent tonsillectomy and adenoidectomy among adults and children was also done. Main surgical indication was concomitant presence of recurrent infections and hypertrophy of nasopharyngeal and palatine tonsils. Among these patients, 160 (64%) were classified as grades III to IV hypertrophy. Lymphatic or follicular lymphatic hyperplasia was observed in 205 patients (82%); focal inflammation was verified in 45 (18%) subjects. Among those, 2 patients presented squamous cell cysts, 2 had *Actinomyces* sp colonies and 1 cat scratch disease.

Errilic, Aydin and Kocer [8] conducted an archival retrospective study of 1220 cases and reported their findings in the *Journal of Laryngology and Otology* in 2002. They submitted that although tonsillectomy is a frequently performed operation but there is little information about the histological features of a tonsillar specimen. Suna Erkiliç, Abdullah Aydin and N. Emrah Koçer [8] documented the presence and the proportion of mesenchymal tissues (skeletal muscle, cartilage, fat, bone) and seromucinous glands. They were noted as focal, multifocal or abundant. The incidence of skeletal muscle was 89 per cent (1085 cases; 206 focal, 465 multifocal, 414 abundant), seromucinous glands 35 per cent (429 cases; 236 focal, 134 multifocal, 59 abundant), fat 21 per cent (251 cases; 208 focal, 43 multifocal), cartilage three per cent (31 cases), and bone one per cent (seven cases). They also found that in 165 cases, 14 per cent skeletal muscle, one per cent seromucinous glands, one per cent cartilage, one per cent fat, and less than one per cent bone were found between hyperplastic lymphoid tissue.

Ikram and Khan et al [11] performed retrospective evaluation of 400 tonsil specimens removed from 200 patients. They found that 68.3% of the specimens contained reactive lymphoid hyperplasia, 13.5% had follicular hyperplasia, 10.0% represented acute or chronic tonsillitis, and 7.5% of the tissue was normal. Only one case of malignancy was detected: a non-Hodgkin's lymphoma in one tonsil of a patient who was a cigarette smoker and who had asymmetric tonsils.

Isolated cases of cartilaginous choristoma of the tonsil have been documented in literature [12].

To investigate the issue of histopathologic examination of routine tonsillectomy specimens, Dohar and Bonilla conducted a nationwide survey of members of the American Society of Pediatric Otolaryngology (ASPO) [15]. They received a wide range of opinions and arrived at no definite consensus. Explanations for the practice included institutional protocol and better medicolegal cover. Their final analysis of details of the cases provided by members revealed only one malignancy among 2,012 specimens and the rest were of inflammatory origin.

Williams and Brown [13] published their retrospective study using the SNOMED database of 4070 patients age 21 years or younger who underwent tonsillectomy and/or adenoidectomy between 1970 and July 2001 at the University of Florida. The age distribution of the study group was 0 to 5 years (52%), 6 to 12 years (37%), and 13 to 21 years (11%). Specimens consisted of tonsils only (15%), tonsils and adenoids (40%), and adenoids only (45%). Clinically significant were those diagnoses that impacted the care of patients and included malignancies and some infections. Clinically non-significant diagnoses included normal, acute or chronic tonsillitis, and tonsillar hyperplasia. Clinically significant pathological processes were seen in the tonsil or adenoid specimens of 3 of the 4070 patients. These 3 cases included a 2-year-old male with Burkitt's lymphoma, a 19-year-old male with non-Hodgkin's lymphoma (small noncleaved cell, non-Burkitt's type), and an 11-year-old male with a probable viral process but in whom a lymphoma could not be absolutely excluded. All 3 of these patients had signs and symptoms, including significant cervical lymphadenopathy, meriting microscopic analysis of the specimens. They concluded that microscopic examination of all routine tonsils and adenoids for individuals 21 years or younger is not indicated. Gross examination is still recommended. Clinical suspicion and specimen asymmetry should be used to determine when thorough histological examination is merited. However the arbitrary cut off point for age restricts the effectiveness of this study.

Likewise, Alvi and Vartanian found only one malignancy in a pathologic review of 526 post-tonsillectomy specimens [16]. They concluded that routine evaluation is not necessary and results in a waste of both money and pathologist man-hours.

Beaty et al, in their retrospective review of adult tonsillectomy tissue, found a higher rate of positive specimens: 25 malignant tumors in 476 samples [17]. However, these 25 samples had been obtained from patients with several definite and identifiable risk factors that had already been detected prior to surgery. Based on their findings, Beaty et al recommended that evaluation be performed only on specimens of patients who had certain risk factors.

Out of the total number of 50 patients in our study the dominant sex was male which corresponded with the general population ratio as it is seen in all the other quoted studies. The common age group, as we found in our study, was the second and third decade of life, which was also similar to these studies [11].

Dominant clinical diagnosis of cases in our study was chronic tonsillitis for which surgeries were performed but it is interesting to know that Ikram and Khan et al [11] who did a study of 200 patients reported that they had performed majority of tonsillectomies for quinsy, sleep disorders and snoring. We further found out that besides the hypertrophy of palatine tonsils being associated with recurrent tonsillitis, the presence of chorionomatous mesenchymal tissue may also cause the clinical picture of tonsillitis. Although this conclusion has not been drawn by many studies but isolated case reports dwell upon it [12] and long term studies keeping this in mind are required to further conclude on this issue.

The question which arises here is that what are the possible methods by which the presence of chorionomatous mesenchymal tissue can be detected. The most appropriate appears to be the use of imaging techniques to assess the presence or absence of such aberrant tissue. This would help in finding possible histology and its positive or negative relationship to a diagnosis of recurrent chronic tonsillitis. This would enable early surgical intervention and hence reduction in morbidity. Kawabe et al did a FDG-PET Scan on two cases with Chronic Tonsillitis and found symmetrical high FDG uptake by the tonsils affected. The SUVs (standardized uptake values) for the tonsils of patient 1 with some complaints and a high CRP level were higher than those for patient 2 with no complaints and a normal CRP level. The differences in SUVs were therefore thought to reflect the differences between the two patients in the activity of inflammation. Histopathologically, follicular hyperplasias were seen in both patients, but the size of the follicles in patient 1 tended to be larger than those in patient 2. Many neutrophils were found in the peripheral epithelium of the tonsils of patient 1, but few neutrophils were found in the peripheral epithelium of patient 2. These indicated that the tonsils of patient 1 were in a more active state of inflammation than those of patient 2.

But in patients who did not present with tonsillitis, high FDG uptake by tonsils was often found. FDG-PET is not able to distinguish active inflammation from physiological inflammation. The existence of remarkably high FDG

uptake in the tonsils may indicate the existence of active inflammation [20]. MRI may also be an investigation that can identify large follicular hyperplasias and in a patient with symptoms it may assist in triage of patients needing early surgery.

It is common throughout the world to routinely send tonsillectomy specimens for histologic examination to screen for occult malignancy. This concern over cancer has traditionally been supported in the literature, which indicates that younger patients with lymphomas of Waldeyer's ring can have tonsillar abnormalities and that in older patients, tonsillar findings or a neck mass might be associated with primary tonsillar carcinoma [14]. However, microscopic examination of tonsil specimens generally correlates well with preoperative clinical impressions, and pathology findings rarely alter patient management. Dohar and Bonilla nevertheless recommended that histopathologic evaluation be conducted routinely if only to detect rare, unsuspected malignancies [15]. Arguments in favor of microscopic examination of all tonsillectomy specimens are found in certain isolated anecdotal reports [18, 19]. Cases involving an unsuspected diagnosis of lymphoma or teratoma are two such examples.

Our study also showed that mesenchymal tissues (skeletal muscle, cartilage, fat, bone) and seromucinous glands might be seen in different proportions in routine tonsillectomy specimens. This was comparable to results of other studies however their clinical significance is yet to be proven for which larger, long-term studies would be required [8]. However assessing the micromorphology, will certainly contribute to determining the possible role of imaging techniques in evaluation of a patient with chronic tonsillitis for earlier surgical intervention and hence reduction in associated morbidity.

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