Tzu Chi Medical Journal 2018; 30(3): 181-4

Original Article

Study of adenotonsillectomy specimens: An institutional experience

Jyotsna Naresh Bharti[a], Jitendra Singh Nigam[a], Vivek Nair[a], Archana Hemant Deshpande[a], Amrit Debbarma[b]*

[a]Department of Pathology, Andaman and Nicobar Islands Institute of Medical Sciences, Port Blair, Andaman and Nicobar Islands, India, [b]Department of Otolaryngology, Andaman and Nicobar Islands Institute of Medical Sciences, Port Blair, Andaman and Nicobar Islands, India

Received : 11-Sep-2017
Revised : 24-Nov-2017
Accepted : 28-Dec-2017

Abstract

Objective: Waldeyer's lymphatic ring consists of group of tonsils located over the posterior oropharyngeal wall. The palatine tonsils are largest tonsil. The present study was aimed to evaluate the significance of lymphoid hyperplasia, lymphocyte infiltration with and without defect in the surface epithelium in chronic tonsillitis (CT) and chronic adenotonsillar hypertrophy (CAH) in resected tonsillectomy and adenotonsillectomy specimens. **Materials and Methods:** A total of 85 patients were included in the study. Fifty-one cases underwent bilateral tonsillectomy and 34 cases underwent adenotonsillectomy. **Results:** The lymphoid hyperplasia was higher in CAH (30/34; 88.24%) as compared to CT (26/50; 52%). Lymphocyte infiltration with or without defect in the surface epithelium was common in CT. The histopathologic criteria of lymphoid hyperplasia and lymphocyte infiltration with or without defect in the surface epithelium showed a statistically significant difference between CT and CAH. **Conclusion:** CT and CAH may be differentiated on the basis of reliable histopathological criteria. Punch biopsy can be performed to avoid CT complication if the clinical diagnosis is true. Choristomas can be clinically confused with true neoplasms, if large in size.

Keywords: *Actinomyces, Choristoma, Nasopharynx, Tonsil, Waldeyer's ring*

Introduction

Waldeyer's lymphatic ring consists of group of tonsils including palatine, pharyngeal, lingual, tubal tonsils, and all over scattered lymphatic tissues in the posterior oropharyngeal wall [1,2]. The palatine tonsils are largest one lying in the tonsillar fossa and lined by stratified squamous epithelium and crypts are covered by nonkeratinizing stratified "transitional type" epithelium with a discontinuous basement membrane and intraepithelial lymphoid cells [2]. The nasopharyngeal tonsil is un-encapsulated with 12–15 shallow crypts lined by columnar ciliated respiratory epithelium and goblet cells [2]. As the location of palatine tonsils is at the entrance of aerodigestive tract, they are considered for the first line of defense against pathogens [1]. The recurrent throat infection, upper airway obstruction due to adenotonsillar hypertrophy, chronic inflammation of tonsil, and very rarely suspicion of malignancy are the common indications for adenotonsillectomy [1,3]. Clinically, the person with more than 6 episodes per year or 3 episodes per year for ≥2 years of tonsillitis with hyperemia on the anterior pillars is considered as a case of chronic tonsillitis (CT) [4]. The cases of chronic adenotonsillar hypertrophy (CAH) are associated with sleep breathing disorders, ranging from obstruction with snoring to obstructive sleep hypopnea–apnea syndrome [1].

Histopathologically, some studies conclude that germinal centers' area is increased in tonsillar hypertrophy (TH) as compared to the CT [5]. Zhang *et al*. observed that there is a significant difference in follicle area of CAH in comparison to CT and conclude that different patterns of pathological mechanism and different behaviors of local immune responses probably play a role in these two conditions [5]. Uğraş and Kutluhan used histopathologic criteria to differentiate CT form CAH and observed that all histopathologic criteria show statically significant difference [4]. The present study was also aimed to evaluate the significance of lymphoid hyperplasia and lymphocyte infiltration with and without defect in the surface epithelium in CT and CAH. The slight-moderate lymphocyte infiltration without defect in the surface epithelium was called when few to nest of lymphocytes' collection was noted in the surface epithelium. Lymphocyte infiltration leading to the defect in the surface epithelium was considered when lymphocytic infiltration forming microvesicles and basement membrane was destroyed. The lymphoid hyperplasia was considered when increase in lymphoid follicle with the presence

**Address for correspondence:*
Dr. Jitendra Singh Nigam,
Department of Pathology, Andaman and Nicobar Islands Institute of Medical Sciences, Port Blair - 744 104, Andaman and Nicobar Islands, India.
E-mail: nigamjs@gmail.com

How to cite this article: Bharti JN, Nigam JS, Nair V, Deshpande AH, Debbarma A. Study of adenotonsillectomy specimens: An institutional experience. Tzu Chi Med J 2018;30:181-4.

Access this article online
Quick Response Code:
Website: www.tcmjmed.com
DOI: 10.4103/tcmj.tcmj_133_17

of pale-staining germinal center. The study also found the incidence of unusual mesenchyme tissue in resected tonsillectomy and adenotonsillectomy specimens.

Materials and methods

The present study is a cross-sectional retrospective study, and it was performed in the Department of Pathology. A retrospective analysis of data was performed on the patients who underwent tonsillectomy between January 2015 and March 2017. The confidentiality of the patient details and ethical standards was maintained throughout the study, and only the relevant, de-identified patient data were recorded in a pro forma. The clinical chart, pathology requisition form, and histologic slides were reviewed. Surgical indication considered was upper airway obstruction, obstructive sleep apnea, hypertrophy of nasopharyngeal and palatine tonsils, and concomitant presence of recurrent infections as in definition of CT. Exclusion criteria were unilateral enlargement and removal of tonsil as a part of styloidectomy. Formalin-fixed specimen of tonsils was received in the pathology department at our institution. On an average, two of sections were archived in paraffin blocks for each tonsil. Tissue sections were stained with hematoxylin and eosin.

Results

A total of 85 patients were included in the study, of which 51 cases underwent tonsillectomy and 34 cases underwent adenotonsillectomy. In the present study, tonsillar pathology was commonly seen in 0–10 years (35.2%) followed by 11–20 years (32.9%) [Table 1]. The maximum number of cases clinically diagnosed was CT (50 cases) and adenotonsillar hypertrophy (34 cases) followed by 1 case of tonsillar cyst. The patients were distributed in two Groups A and B [Table 2].

In Group A, there were 21 (42%) male and 29 (58%) female patients. The mean age was 21 years, with a range of 4.5–50 years. The preoperative diagnosis was CT.

In Group B, there were 17 (50%) male and 17 (50%) female patients. The mean age was 9 years with a range of 4.5–26 years. The preoperative diagnosis was CAH.

Histopathologically, all sections were evaluated for lymphoid hyperplasia [Figure 1c], lymphocyte infiltration with [Figure 1b] or without [Figure 1a] defect in the surface epithelium, and the presence of unusual mesenchyme tissue in resected tonsillectomy and adenotonsillectomy specimens. The lymphoid hyperplasia was higher in CAH (30/34; 88.24%) as compared to CT (26/50; 52%). Lymphocyte infiltration with or without defect in the surface epithelium was common in CT [Table 2]. The unusual mesenchyme choristomatic tissue seen was the cartilage [Figure 1d and e] in 9.4% (8/85), followed by fat [Figure 1f] in 3.5% (3/85) and bone [Figure 1g] in 1.17% (1/85) cases. Among these, 5.88% (5/85, 4 Group A, 1 Group B) cases showed Actinomyces colonies [Figure 1h] and 1.17% (1/85) case presented with squamous cell cysts [Figure 1i and Table 3]. All the mesenchyme choristomatic tissues were seen in Group A cases. The statistical analyses were performed using Chi-squared test. $P < 0.05$ was considered statistically significant.

Table 1: Age distribution

Age (years)	Number of cases (%) of adenotonsillar hypertrophy	Number of cases (%) of chronic tonsillitis
0-10	22 (64.7)	10 (20)
11-20	9 (26.47)	14 (28)
21-30	3 (8.83)	11 (22)
31-40	Nil	9 (18)
41-50	Nil	5 (10)
51-60	Nil	1 (2)
Total	34	50

Table 2: Distribution of features seen in tonsillectomy (Group A) and adenotonsillectomy specimens (Group B)

Features	Tonsillectomy specimens (Group A)	Adenotonsillectomy specimens (Group B)	*P*
Clinical diagnosis	Chronic tonsillitis 50 cases	Adenotonsillar hypertrophy 34 cases	
Males (%)	21 (42)	17 (50)	0.4723
Females (%)	29 (58)	17 (50)	0.4723
Lymphoid hyperplasia (%)	26 (52)	30 (88.2)	0.006
Slight-moderate lymphocyte infiltration without defect in the surface epithelium (%)	48 (96)	6 (17.6)	<0.0001
Lymphocyte infiltration leading to the defect in the surface epithelium (%)	45 (90)	3 (0.08)	<0.0001

Table 3: Mesenchymal choristomatic tissue/actinomyces in the palatine tonsillectomy (Group A) and adenotonsillectomy specimens (Group B)

Mesenchyme tissue	Number of cases/85	Percentage
Cartilage	8 (Group A)	9.4
Fat	3 (Group A)	3.5
Bone	1 (Group A)	1.17
Actinomyces	4 (Group A)/1 (Group B)	5.88

The histopathologic criteria of lymphoid hyperplasia and lymphocyte infiltration with or without defect in the surface epithelium showed a statistically significant difference ($P < 0.05$) between CT and CAH [Table 2].

Discussion

Tonsillectomy is one of the most commonly performed surgeries in children in otorhinolaryngology department [1]. The present study also showed the similar trend; a maximum number of cases who have undergone tonsillectomy and adenotonsillectomy were under the age 20 years. No malignant lesion was identified in the present study.

Previous studies were done to see the histomorphological features of CT and CAH are mostly just confined to the

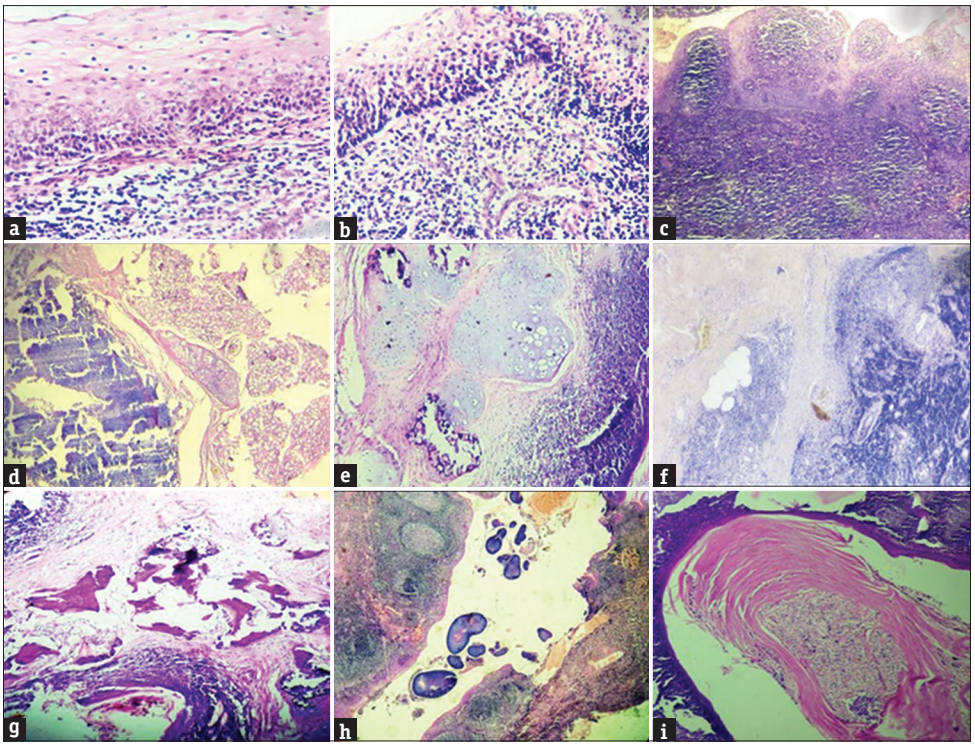

Figure 1: (a) Mild inflammation in the surface epithelium (H and E, ×40). (b) Moderate inflammation and defect in the surface epithelium (H and E, ×40). (c) Lymphoid hyperplasia (H and E, ×10). (d) Chondroid choristoma seen within lymphoid follicles (H and E, ×10). Chondroid choristoma along with lobules of seromucinous acini and lymphoid follicles (H and E, ×10). (e) Fat choristoma seen within lymphoid follicles (H and E, ×10). (h) Osseous choristoma seen within lymphoid follicles (H and E, ×10). (i) Actinomyces colonies present over the surface epithelium (H and E, ×10). (i) Tonsillar cyst (H and E, ×10)

lymphoid follicle, germinal center, and crypts without considering the tonsillar surface epithelium [1,4,5]. Only a few studies include tonsillar changes with surface epithelial changes [1,4]. However, the present study was based on lymphoid hyperplasia and lymphocyte infiltration without defect in the surface epithelium and lymphocyte infiltration with defect in the surface epithelium in CT and TH.

Some studies show the significant difference in germinal center area and mean follicle area between CAH and CT [4]. Reis *et al*. observed that CAH shows more than six germinal centers per field at ×100 magnification and conclude that the number of germinal centers may be able to differentiate the palatine tonsils of hypertrophy from recurrent tonsillitis [1]. The lymphoid hyperplasia is common in CAH and has a statistically significant difference as compared to CT [4] similarly observed in the present study. However, lymphoid hyperplasia is not only related to CAH but it also seen in acute and CT [4]. Therefore, lymphoid hyperplasia lonely cannot be used for differentiating between CAH and CT [4].

Uğraş and Kutluhan observed that there is a statistically significant difference in the presence of mild-to-moderate lymphocyte infiltrate in the surface epithelium without defect in lining epithelium [4]. They also observed that there are statistically significant differences of the increased number of plasma cells in the subepithelial and interfollicular area between CAH and CT [4]. The presence of neutrophils in the surface epithelium and subepithelial area also showed statistically significant differences between CAH and CT [4]. However, Reis *et al*. observed that infiltration of crypts epithelium by neutrophils or plasma cells around the crypts are not show statistically significant differences between CAH and CT [1]. The present study showed is a statistically significant difference in the presence of lymphocyte infiltrate in the surface epithelium without defect in lining epithelium.

The presence of diffuse lymphocyte infiltration and/or Uğraş and Kutluhan abscess which causes the defect in the surface epithelium shows statistically significant differences between CAH and CT [4]. The present study also showed a significant difference of lymphocyte infiltrate in the surface epithelium with defect in lining epithelium between CAH and CT.

A choriostoma or heterotopias is an aggregate in aberrant locations composed of microscopically normal cells or tissues [6]. A chondroid choristoma was first described by Berry in 1890, and the age varied from 10 to 80 years at the time of diagnosis [6]. Chondroid choristoma does not show any sex predilection in palatine tonsils [7]. The chondroid choristoma of tonsil is usually present as CT with tonsillar enlargement [8]. The proposed mechanism for development of heterotopic cartilage proliferation and bone formation in chronic infalmmation is the ability of mesenchymal progenitor cells to differentiate into various mesenchymal lineages or production of osteogenic substances [6]. Some authors say that choristoma of tonsil occurs as a developmental anomaly leads to the development of aberrant mesenchymal tissue [8]. The cartilaginous metaplasia, a differential diagnosis of cartilaginous choristomas, is often associated with ill-fitting dentures and characterized by scattered cartilaginous cells arranged in various stages of

maturation in single or clustered cartilaginous foci and diffuse calcium deposits [6,8]. The resection of complete lesion along with surrounding tissue is considered as curative. However, removal of perichondrium is important to avoid recurrence of the lesion [6,8]. In the present study, out of eight cases, six showed female preponderance, and all the cases of cartilaginous choristoma (16%, 8/50) were associated with CT. Out of these eight cases, one case showed the presence of both bone and cartilage and one case showed cartilage and mature fatty tissue. The results were comparable to results of other studies; however, their clinical significance is yet to be established for which larger, long-term studies would be required.

The actinomyces are part of normal flora of oral cavity and are anaerobic and Gram-positive bacteria occur in 2%–30% cases. [9]. In our study, 4 cases of CT and 1 case of CAH showed the presence of actinomycosis which accounted 6.17% incidence in resected specimens. Histopathological findings showed no evidence of tissue reaction to actinomyces and its presence was found only due to colonization of the tonsils. Hence, no correlation was found between the presence of tonsillar actinomycosis and recurrent tonsillitis and/or adenoid TH.

Conclusion

The lymphoid hyperplasia and lymphocyte infiltration with or without defect in the surface epithelium showed a statistically significant difference between CT and CAH. These findings can be useful if punch biopsy is performed before tonsillectomy procedure to prevent CT complications and may be beneficial in clinically suspicious cases of CT which are not fulfilling the clinical criteria. Choristomas are the rare entity and of academic interest. They might be one of the causes of recurrent tonsillitis, and their awareness is must among the pathologists so that they are not to be confused from the neoplasms.

Financial support and sponsorship

Nil.

Conflicts of interest

There is no conflicts of interest.

References

1. Reis LG, Almeida EC, da Silva JC, Pereira Gde A, Barbosa Vde F, Etchebehere RM, et al. Tonsillar hyperplasia and recurrent tonsillitis: Clinical-histological correlation. Braz J Otorhinolaryngol 2013;79:603-8.
2. Regauer S. Nasopharynx and Waldeyer's rings. In: Cardesa A, Slootweg PJ, editors. Pathology of the head and neck. New York: Springer; 2006, p. 183.
3. Özbay I, Gençoğlu M, Balıkçı HH, Kucur C, Oğhan F. Histopathological analysis of tonsillectomy specimens: A report from southeastern Anatolia. Kulak Burun Bogaz Ihtis Derg 2014;24:254-8.
4. Uğraş S, Kutluhan A. Chronic tonsillitis can be diagnosed with histopathologic findings. Eur J Gen Med 2008;5:95-103.
5. Zhang PC, Pang YT, Loh KS, Wang DY. Comparison of histology between recurrent tonsillitis and tonsillar hypertrophy. Clin Otolaryngol Allied Sci 2003;28:235-9.
6. Bharti JN, Ghosh N, Arora P, Goyal V. Chondroid choriostoma of palatine tonsil – A rare entity. J Clin Diagn Res 2013;7:1700-1.
7. AbdulMajeed AA, Farah CS. Mixed choriostoma on the anterior dorsal tongue: A new case and review of the literature. Oral Surg 2011;4:26-9.
8. Kannar V, Prabhakar K, Shalini S. Cartilaginous choristoma of tonsil: A hidden clinical entity. J Oral Maxillofac Pathol 2013;17:292-3.
9. Bhargava D, Bhusnurmath B, Sundaram KR, Raman R, Al Okbi HM, Al Abri R, et al. Tonsillar actinomycosis: A clinicopathological study. Acta Trop 2001;80:163-8.