

Histopathological Spectrum of Lesions of Palatine Tonsil - A 3 Year Study

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Abstract: ***Background:** Palatine tonsils are paired masses of lymphoid tissue which act as immunologic barrier against the entry of pathogenic agents into the respiratory and digestive tracts. Despite their protective function, tonsils are prone to infection. Tonsillitis is a common disease especially among the children. Chronic tonsillitis is a disease with repeated attacks of acute tonsillitis or a sub-clinic form of a resistant or poorly treated infection. **Aim:** This study was conducted for studying the clinio-pathological findings of various lesions of tonsils in palatine tonsil. **Materials and methods:** This is a cross sectional study where 132 cases of histopathologically identified tonsillectomy specimens were included. The available data for all the patients as regards to age, sex and clinical symptoms was collected. We studied histopathology of 129 cases of tonsillectomy patients [Unilateral-02, Bilateral-127] and tonsillar biopsy in 02 & tonsil cyst in 01 patients. Representative bits were taken from formalin fixed tonsillectomy specimens whereas biopsies were submitted entirely. Routine hematoxylin and eosin staining was done. **Results:** Amongst the cases, 114 showed chronic tonsillitis. Other lesions were epidermal inclusion cysts in 12 cases, acute on chronic tonsillitis in 02 cases, acute ulcerative tonsillitis with micro abscesses in 01 case and reactive lymphoid hyperplasia in one case. Two malignancies were observed - one case of poorly differentiated squamous cell carcinoma and another case of Non-Hodgkin lymphoma.*

Keywords: Tonsillitis, Tonsillectomy, Histopathology, Tonsillar cyst, Tonsil

1. Introduction

The palatine tonsils are paired nodular masses of lymphoid tissue situated on either side of the oropharynx having an extremely remarkable role in the antimicrobial defense of the body.^[1] They are covered by non-keratinized stratified squamous epithelium along with deep crypts that invaginate into the parenchyma, in which B-lymphocytes are found.^[2] Reaching down into the depth of the tonsil are crypts lined by squamous epithelium containing debris composed of desquamated epithelium, bacteria (especially actinomyces), and fungal organisms. The lymphoid tissue surrounding the crypts has nodules, often with germinal centers. Deep in the crypts the epithelial layer becomes blurred since the lymphocytes of the tonsil invade it. A capsule covers the parts of the tonsil not exposed to the surface and connective tissue septa extend into the tonsil from the capsule.^[3]

Tonsillitis is one of the commonest infectious diseases seen commonly in the young age group. Various organisms including viruses like Reo virus, Adenovirus, Influenza virus and Echo virus, and bacteria like Beta-hemolytic Streptococcus are implicated in causation of tonsillitis. Rarely, it can be caused by Fungi or Parasites.^[4]

Tonsillectomy is generally indicated when there are frequent attacks of acute tonsillitis. Other indications of tonsillectomy include obstructive sleep apnea, quinsy, tonsiloliths, tonsillar cysts and suspicion of malignancy. We intend to report 132 cases operated for tonsillectomy.

2. Materials and Methods

This is a cross sectional study conducted in Department of Pathology, Smt. Kashibai Navale Medical College & General Hospital, Pune during the period of January 2014 to December 2016. Necessary approvals were taken from ethical committee of the institution. The available data for all the patients as regards age, sex, clinical symptoms was collected from the records of histopathology section in the Department of Pathology. Preoperative clinical histories which included clinical presentation, clinical course and complete medical history were gleaned from the patient's charts and clarified with the attending surgeons [ear throat nose (ENT)] wherever necessary. Grade of tonsillar hypertrophy along with cardinal signs of chronic tonsillitis like flushing of anterior pillars, palpable jugulodigastric lymph nodes, cheesy material in crypts (Erwin Moore's sign) were determined from the clinical data.

132 cases were received, out of which 129 were tonsillectomy specimens (Unilateral-02, Bilateral-127), 2 were tonsillar biopsies and 1 was received as tonsillar cyst. The specimens were fixed in 10% formalin. Representative bits were taken from formalin fixed tonsillectomy specimens whereas biopsies were submitted entirely to make paraffin blocks. The sections were cut at 3-4 micron thickness and were stained with Hematoxylin and Eosin. Microscopic examination was done. The patients were discharged on third to fifth post-operative day in stable condition.

3. Results

There were 67 males and 65 females, all Caucasians, ranging in age from 5 - 69 years. Female mean age was of 30 years and a male mean age of 34 years. The age range in our study was 0-69 years with mean age of 34.5 years. Majority of the patients (58.3%) were aged below 20 years. A slight predominance of males (50.7%) was noted. The most common clinical presentation was recurrent intermittent episodes of throat pain & odynophagia (Table 1). The palatine tonsils were enlarged/fibrosed with congested anterior pillars. Cheesy material could be seen lodged in tonsillar crypts (Erwin moore's sign). Jugulodigastric lymph nodes were palpable in cases of chronic tonsillitis. Two malignant cases had unilateral enlargement of tonsil and ulcero-proliferative growth respectively (Table 2). Amongst 132 cases, histopathological examination showed varied non-neoplastic and neoplastic lesions (Table 3). 126 cases showed chronic tonsillitis. In our study, 10 cases of chronic tonsillitis showed actinomycotic colonies, however there was no tissue reaction. Epidermal inclusion cysts were found in 12 cases which were equally prevalent in paediatric and adult age group. Two cases of acute on chronic tonsillitis, acute ulcerative tonsillitis with micro abscesses in one case and reactive lymphoid hyperplasia in one case were seen. Malignancy was observed in 2 cases – one case of poorly differentiated squamous cell carcinoma in a 69 year old male and another of Non-Hodgkin lymphoma in a 44 year old male.

Table 1: Most common clinical presentation (symptoms)

Sr. No	Symptom	Percentage (%)
1.	Throat pain	90.9
2.	Odynophagia	83.3
3.	Previous history of fever	77.2
4.	Cough	58.3
5.	Foreign body sensation	67.4
6.	Snoring	71.9
7.	Apneic spells	28.7

Table 2: Most common clinical presentation (signs)

Sr. No	Signs	Percentage (%)
1.	Congestion of tonsils, anterior pillars, peritonsillar region	78
2.	Cheesy material in crypts of tonsils	71.9
3.	Enlarged tonsils	78
4.	Fibrosis	65.9
5.	Halitosis	56
6.	Growth and ulceration	1.5
7.	Retention cyst	7.5
8.	Palpable jugulo-digastric lymph nodes	86.3

Table 3: Histopathological findings in palatine tonsils

Sr. No	Diagnosis	No. of cases	Percentage (%)
1.	Chronic tonsillitis	114	86.3
2.	Acute on chronic tonsillitis	02	1.51
3.	Acute ulcerative tonsillitis with microabscesses	01	0.85
4.	Epidermal inclusion cyst	12	9.09
5.	Reactive lymphoid hyperplasia	01	0.75
6.	poorly differentiated squamous cell carcinoma	01	0.75
7.	Non-Hodgkin lymphoma	01	0.75
	TOTAL	132	100

4. Discussion

The pathogenesis of infectious/inflammatory disease in the tonsils most likely has its basis in their anatomic location and their inherent function as organ of immunity, processing infectious material and other antigens and then becoming, paradoxically, a focus of infection/ inflammation. No single theory of pathogenesis has yet been accepted, however viral infection with secondary bacterial invasion may be one mechanism of the initiation of chronic disease, but the effects of the environment, host factors, widespread use of antibiotics, ecological considerations and diet all may play a role. Tonsils are important components of the immune system and their infections are very frequent. Tonsils are immunologically more active in the first years of life.^[5]

During aging, whereas lymphoid tissue regresses, sub epithelial tissue changes into fibrotic tissue and crypts alter into cavities filled with keratin. In case of infection, bacteria that inhabit the crypts spread into the tonsil and leave their toxins and other products in it, eventually leading to polymorphonuclear leukocyte infiltration, swelling, necrosis and surface ulceration in tonsils. Consequently, after acute infection, bacteria may inoculate into the core.^[6]

These infections are highly frequent especially in childhood. Although antibiotic therapy may be sufficient in the treatment of acute tonsillitis, tonsillectomy remains the treatment of choice in the management of recurrent and chronic tonsillitis. In recurrent tonsillitis; the goal of the treatment is to eradicate the bacteria that cause infection.^[7]

Chronic tonsillitis most often affects children, but can be seen in adults, probably due to a local dysfunction of the epithelium. The recurrent nature of acute tonsillitis is attributed to the bacteria surviving intracellularly, thus avoiding antibiotic killing and causing re-infection. Repeated attacks of tonsillitis can lead to tonsillar hypertrophy causing airway obstruction, thus leading to excision. Many studies stated that though chronic inflammation is present in both tonsillitis and tonsillar hypertrophy, it is more marked in tonsillitis patients. Fibrosis can only be seen in cases of tonsillitis. However, high bacterial load and elevation of immunologically active cell population in the tonsils are observed in both groups of patients.^[8]

According to Alcantara et al.^[7], tonsillectomy is the most commonly performed surgical procedure in pediatric patients. The ages of the patients in this study coincide with the age group where hypertrophy and tonsillitis are more intense and frequent.^[9,10]

In our study patients' age group ranged from 5 - 69 years, majority of the patients (58.3%) were below 20 years of age. However two patients with tonsillar malignancy were of higher age group.

Ugras et al^[11] investigated eight histopathological criteria in all palatine tonsils: 1- Presence of slight-moderate lymphocyte infiltration in the surface epithelium, 2- Presence of abscess leading to the defect in the surface epithelium (Ugras's abscess), 3- Presence of diffuse

lymphocyte infiltration leading to the defect in the surface epithelium, 4- Presence of polymorphonuclear leukocytes in the surface epithelium and in the sub epithelial area, 5- Presence of lymphoid hyperplasia, 6- Increase in the plasma cells number in the sub epithelial area and in the interfollicular area, 7- Presence of fibrosis and 8- Presence of atrophy. Seven out of eight criteria they studied were more closely associated with chronic tonsillitis, only one criteria (the presence of lymphoid hyperplasia) was higher in chronic tonsillar hypertrophy compared chronic tonsillitis. In our study the presence of slight-moderate lymphocyte infiltration in the surface epithelium seen in 120 (90.9%) cases, the presence of Ugras's abscess and/or diffuse lymphocyte infiltration leading to the defect in the surface epithelium was seen in 109 (82.5%) cases, increase in the plasma cells number in the subepithelial area and in the interfollicular area in 88 cases (66.6%), the presence of polymorphonuclear leukocytes in the surface epithelium and in the subepithelial area in 41 cases (31%), the presence of lymphoid hyperplasia in 01 cases (0.75%), the presence of fibrosis in 05 cases (3.7%) and the presence of atrophy was present in 01 cases (0.75%).

Epidermoid cysts are benign lesions where cystic spaces are lined by squamous epithelium. They generally appear in areas where embryogenic element fuse. They can be classified as being either congenital or acquired based on its origin.^[12] Histopathological, multiple sections studied from the tonsils showed stratified squamous epithelium with underlying lymphoid follicles. The tonsillar crypt contained mixed inflammatory infiltrate (lymphocytes and polymorphs) with increased vascularity. There was hyperplasia of lymphoid follicles with prominent germinal centers. Also seen in the same section was an epidermal inclusion cyst with wall lined by stratified squamous epithelium containing keratin flakes, cholesterol crystals, cyst macrophages and lymphocytes. Epidermoid cysts can be associated with certain hereditary syndromes like Gardner syndrome and basal cell nevus syndrome. Treatment for these lesions is surgical excision of the cyst. It should be excised without opening because its contents could have an irritating effect on the surrounding fibrovascular tissue.^[13]

Actinomycetes are filamentous branched bacteria and live as commensal organisms within the oral cavity. When present in tonsillar tissue, they may present with recurrent tonsillitis along with complaints of sore throat, fever. Human

actinomycosis is mainly caused by *A. israelii*.^[14] Van Lierop et al^[15] found no tissue reaction due to actinomyces colonies and hence reported no correlation between tonsillar actinomycosis and recurrent tonsillitis. In our study, ten cases of chronic tonsillitis showed actinomycotic colonies, however there was no tissue reaction.

According to the old disease classification, cancer of the palatine tonsils was the most common tumour of the oropharynx. However, the incidence of tonsillar cancer has declined significantly in many countries because of the adoption of the new international classification of disease (ICD) since 1993.^[16] Two - thirds of the patients with tonsillar carcinomas present at advanced stages because early lesions are generally asymptomatic when small.^[17] Carcinoma arising from these sites usually is squamous in origin and is related strongly to smoking, HPV infection and, to a lesser degree, alcohol ingestion.^[18] However, during the past 2 decades, numerous studies have shown that human papillomaviruses (HPV) are a risk factor for the development of oropharyngeal carcinoma.^[19] Squamous cell carcinoma (SCC) is the most common malignancy followed by Non-Hodgkin's lymphomas (NHL) in the tonsil. NHL of the oral cavity and oropharynx usually account for 13% of all primary extra nodal NHL with approximately 70% occurring in the tonsils.^[20]

NHL represents a small percentage of oral malignancies and palatine tonsil is the most frequently involved site. This lymphoma has a peak incidence in the 6th and 7th decades of life in published series' and the sex incidence is slightly male predominant. Clinical signs and symptoms are not specific and occur as a result of asymmetrical tonsillar enlargement (B) NHL rarely involves tonsils with the diffuse large B-cell type being common at this location.^[20] Babu et al^[17] reported a total of 5 cases of tonsillar malignancy- two undifferentiated carcinomas, two NHLs, and one SCC. In our study, we observed one case of SCC and one case of NHL.

5. Conclusion

In conclusion, chronic tonsillitis is the commonest lesion diagnosed in palatine tonsil. However histopathology plays an important role in diagnosis of all the neoplastic and non-neoplastic lesions.

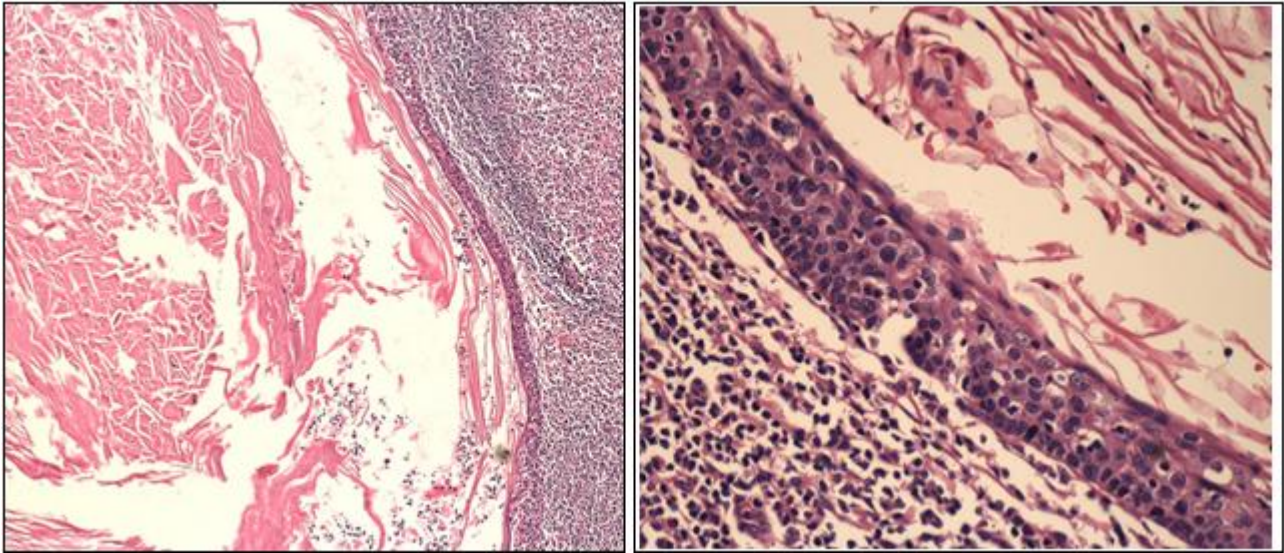


Figure 1: Photomicrograph showing an epidermal inclusion cyst (H&E stain) A) with keratin debris and squamous lining (x 10), B) Squamous lining of the epidermal cyst (arrow) (x 40)

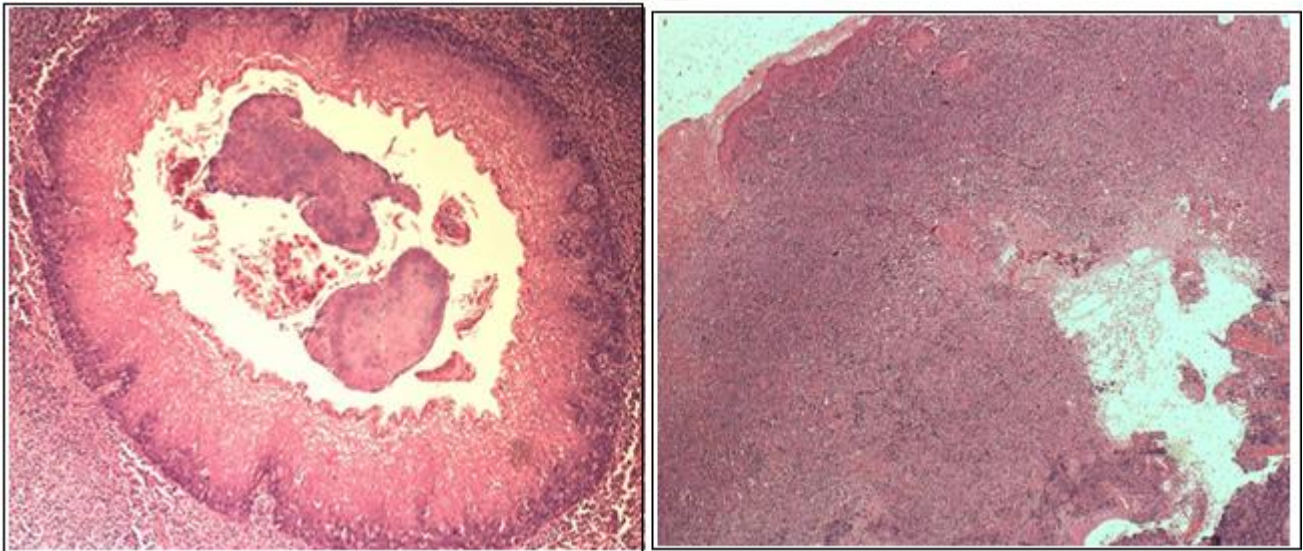


Figure 2: Tonsil showing Actinomycotic colony within the tonsillar infiltrates in the crypt epithelium crypt and cryptitis. (H&E stain x 10).

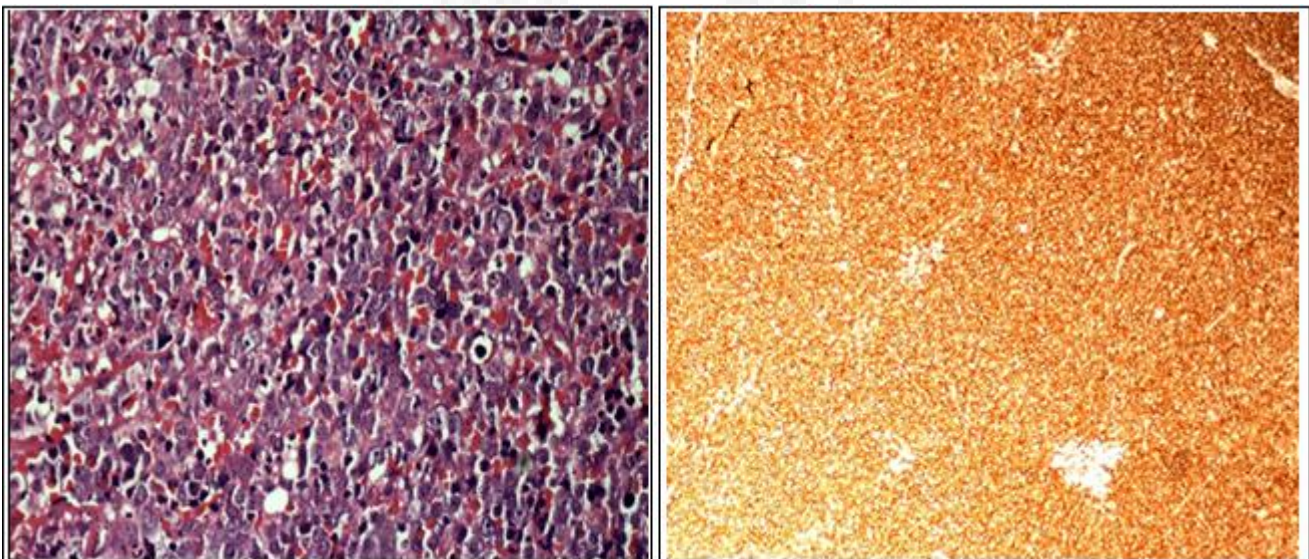


Figure 3: Photomicrograph of Non-Hodgkins Lymphoma (H & E stain): A & B) Medium sized neoplastic lymphoid cells with hyperchromatic nuclei C) Immunohistochemistry positivity (CD 20 x 10)

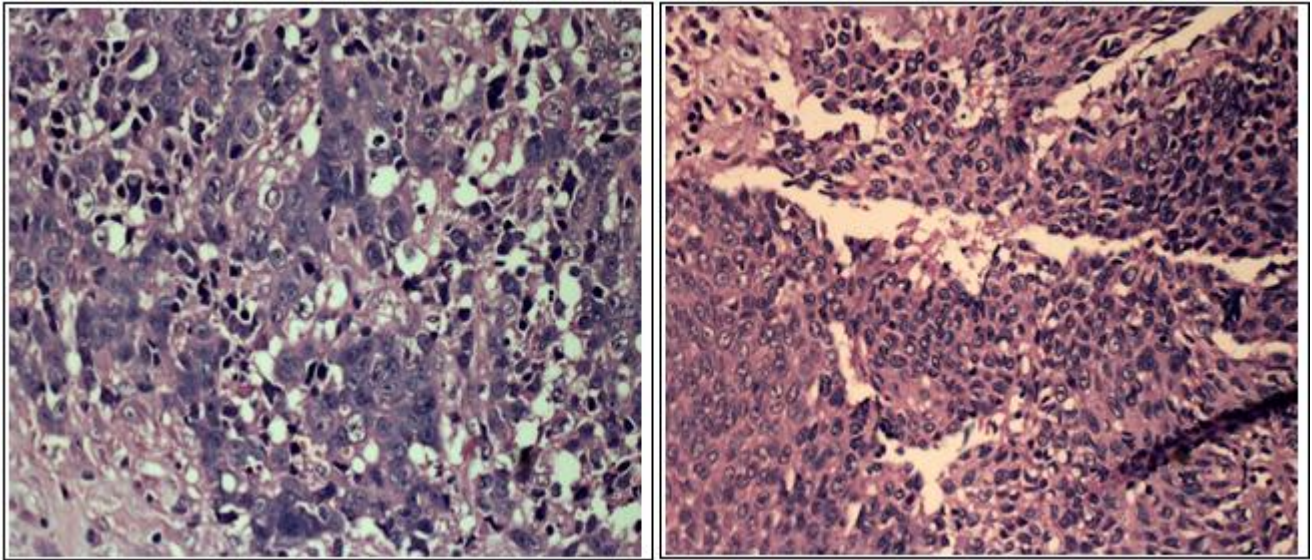


Figure 4: Photomicrograph of Poorly differentiated squamous cell carcinoma. a & b) Round to polyhedral cells with abundant eosinophilic cytoplasm (H&E stain x 40).

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