THE ANALYSIS OF ROUTINELY PERFORMED HISTOPATHOLOGICAL EXAMINATION IN TONSILLECTOMIES INDICATED BY CHRONIC TONSILLITIS

BY

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PREFACE

This dissertation was completed as the partial fulfillment of the requirement for the Degree of Master of Medicine (Otorhinolaryngology-Head & Neck Surgery) Universiti Sains Malaysia. The title chosen, *'The Analysis of Routinely Performed Histopathological Examination in Tonsillectomies Indicated by Chronic Tonsillitis'* was based on the Cuban Formula, the technique which was taught during the Basic Statistics and Research Methodology Workshop, conducted for postgraduate students, in 2004.

The preliminary work for this dissertation was done in a retrospective fashion to give the rough idea on how much time should be spent, how many patients should be included, what are the value-added items that can be produced and what are the expected queries that may arise. Finally, a paper entitled *'The Routine Histopathological Examination of Tonsillectomy Specimens at Hospital Universiti Sains Malaysia-Retrospective Study and Its Implication'* was produced. It has been presented in both national and international meetings. It was also published in the *Malaysian Journal of Medical Sciences* in 2007.

The aim and outcome of this study is not to contradict or to change the currently practiced procedure but rather to provide additional information especially in the era of evidence-based medicine.

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LIST OF ABBREVIATIONS

ENT	- Ear, Nose & Throat
HPE	- histopathological examination
H & E	- hematoxylin and eosin
HUSM	- Hospital Universiti Sains Malaysia
ORL-HNS	- Otorhinolaryngology-Head & Neck Surgery
OSA	- obstructive sleep apnoea
OT	- operation theatre

LIST OF DEFINITIONS

Acute tonsillitis	- an acute episode of severe illness, pyrexia and dysphagia lasting more than five days associated with generalized erythematous reaction of tonsil
Recurrent tonsillitis	- attack of more than seven episodes of acute tonsillitis per year of four to five episodes per year in two years
Tonsillectomy	- an operation whereby both tonsils are removed commonly through dissection technique

ABSTRACT

BAHASA MALAYSIA VERSION

TAJUK : Analisa Ke Atas Pemeriksaan Rutin Histopatologi Terhadap Spesimen Tonsil Selepas Pembedahan Tonsil Yang Diindikasikan Oleh Tonsilitis Kronik.

OBJEKTIF : Objektif kajian ini ialah untuk menilai keputusan pemeriksaan rutin histopatologi terhadap spesimen tonsil terutama tentang diagnosis akhir serta penemuan-penemuan lain.

KAEDAH : Kajian ini dijalankan secara pemerhatian prospektif yang mana seramai 197 pesakit yang menjalani pembedahan tonsil antara Ogos 2005 hingga Januari 2007 telah dikaji. Kes yang disuspek sebagai malignan akan dikecualikan. Semua pembedahan telah dijalankan mengikut kaedah disseksi konvensional di Hospital Universiti Sains Malaysia. Semua spesimen telah dihantar untuk ujian histopatologi sebagaimana rutin.

KEPUTUSAN : Semua spesimen yang telah dikaji hanya menunjukkan perubahan tisu limfoid secara reaktif terhadap jangkitan. Tiada spesimen yang dikesan sebagai malignan. Koloni *Actinomyces* yang ditemui adalah telah dijangka.

KESIMPULAN : Kajian ini membuktikan bahawa diagnosis yang dibuat secara klinikal adalah bertepatan dengan keputusan ujian histopatologi. Pemeriksaan spesimen tidak seharusnya dibuat sebagai prosedur rutin melainkan ada keraguan kemungkinan malignan atau ia diperlukan atas sebab-sebab medikolegal.

ABSTRACT

ENGLISH VERSION

TITLE : The Analysis Of Routinely Performed Histopathological Examination In Tonsillectomies Indicated By Chronic Tonsillitis

OBJECTIVE : The objective of this study was to see the outcome of sending routine specimen for histopathological examination in term of final diagnosis and incidental findings.

METHOD : This was an observational prospective study whereby 197 patients who had undergone tonsillectomy between August 2005 to January 2007 were recruited. Malignant suspicion cases were excluded. All of the operations were performed with conventional dissection method at Hospital Universiti Sains Malaysia. All specimens were sent for histopathological examination as routinely performed.

RESULT : All of the studied specimens showed reactive lymphoid hyperplasia changes. No specimen noted to be malignant. *Actinomyces* colonies were common incidental findings.

CONCLUSION : This study concluded that the clinical diagnosis was no different with the histopathological result. The examination should not be performed as a routine procedure unless if there was any malignant suspicion or for medicolegal purposes.

1.0 INTRODUCTION

1.0 INTRODUCTION

Tonsillectomy is the most common surgical procedure in Otorhinolaryngology – Head & Neck Surgery setting, especially in paediatric population. It is defined as a surgical excision of palatine tonsils. It is documented that the first described tonsillectomy was performed in India about 1000 BC. The initial practice was to partially remove the tonsil but the technique has evolved after it was found that the left over tonsils became hypertrophied.

There are several indications for tonsillectomy, which can either be absolute or relative. Generally, it is to serve the purpose of therapeutic, diagnostic or as an access for other procedure.

The absolute clinical indicators for tonsillectomy are enlarged tonsils that caused upper airway obstruction, severe dysphagia, sleep disorders or cardiopulmonary complications, peritonsillar abscess, tonsillitis causing febrile convulsions, persistent or recurrent tonsillar hemorrhage, tonsils requiring biopsy to define tissue pathology and failure to thrive which is not attributable to other causes. The relative indications include recurrent infection, peritonsillar abscess, halitosis, tonsillitis in streptococcal carrier not responding to beta-lactamase-resistant antibiotics and orofacial or dental disorders.

In practice, the most common indications for tonsillectomy are the episodes of recurrent infection to the tonsils or tonsillar hypertrophy causing obstructive symptoms such as snoring and sleep apnea. Recurrent acute tonsillitis is defined as repeated attacks of true

acute tonsillitis, which is documented to occur three to four times per year for two consecutive years. It is performed under general anesthesia by various methods, the conventional and being the commonest method is by using dissection method.

In some centers performing tonsillectomy, regardless of the indications, tonsils specimens are sent routinely from the operation theatre to the pathology laboratory for histopathological examination (HPE) because of the concern that the tonsil might harbor malignancy. However recently, more and more authors came up with observations and concluded that routine histological examinations of the tonsils are unnecessary unless cancer is suspected.

In Malaysia, every hospital has its own stand regarding the matter. Although majority of the practicing surgeons in the country would prefer to have histopathological evaluation of all the specimens, there are still those who will subject the specimen for HPE in cases only when malignancy is suspected. In a private setting, where the patient has to pay for all the cost, or in a hospital where the histopathology department is not readily available, the selection of specimens for histopathological examination is more stringent.

1.1 Literature Review

Few studies done have demonstrated that sending routine tonsil specimens following tonsillectomy operation for histopathological examination are not cost-effective. Routine HPE will consume a lot of time, which usually takes weeks, reagents, manpower and man-hour, to get the official report of reactive lymphoid hyperplasia or lymphoid follicular hyperplasia, which is always consistent with chronic tonsillitis. On top of that, when specimens are sent for routine evaluation, most often the patient has to come for another appointment to review the report. This leads to overcrowding of patients in the clinic, increase the burden to patient where they have to travel and miss their school or work for another one precious weekday.

Only few cases of routine histopathological examination were positive malignancy. Almost all of them were clinically suspected. In 2003, a retrospective study was conducted from 1970 to 2001 in University of Florida revealed that out of 4070, only three cases were histologically to be malignant. All three cases were clinically diagnosed.

Mubasher *et al* studied 200 patients and only one case was positive for malignancy. The patient was having asymmetric tonsillar enlargement and was a smoker. These are the two among few risk factors known to cause tonsillar malignancy. Dohar *et al* (1996) found one out of 2012 samples was positive while Beaty *et al* (1998) demonstrated one out of 526 specimens. Both positive cases were already suspected during consultation in the clinic.

Article published by Erdag T K *et al* in Turkey, a six year study conducted between 1990 to 2005, revealed that from 2743 cases of routine tonsillectomy and / or adenoidectomy done for patient 18 years old and below, nil of them are positive malignancy.

Similar findings quoted by Dost P *et al* (2005) who studied 400 paediatric patients aged 10 and below who had undergone the operation. 200 of them underwent the operation in 1999 and the other 200 were in 2004. All of the specimens were negative for malignancy.

Felippe Felix *et al* in 2006 published a data conducted from a study of 2103 post tonsillectomy specimens in the Brazilian community and four cases turn out to be malignant. All of them were non-Hodgkin's lymphoma and already suspected during clinical assessment before surgery. They concluded that routine histopathological analysis of all tonsillectomies specimen is not necessary. The risk factors established by Beaty *et al* (Table 1.1) should guide the selection of specimens for examination, in order to try to lower the cost without performing the unnecessary exam.

As far as the risk factor for developing tonsillar malignancy is concerned, they can be elicited from a thorough history and a complete physical examination. Having said that, the strongest single risk factor is the unilateral tonsillar enlargement (Beaty *et al*, 1998).

As in any other types of malignancy involving the oral cavity and oropharyngeal region, the modifiable risk factors for the cancer development include smoking and paan leef or betel nut use.

Table 1.1 : Risk factors for tonsillar malignancy

History	Examination
Old age	Tonsillar asymmetry
Smoking	Tonsillar lesion
Paan leaf / betel nut use	Neck mass
History of cancer	
Constitutional symptoms	

Constitutional symptoms which include loss of appetite and loss of weight are more of systemic manifestation of the disease. In contrast, tonsillar lesion for example ulcerated mucosa or fungating growth on the surface is almost always pathognomonic with malignant changes. Lymphoma and squamous cell carcinoma being the commonest leading pathology, which at most of the time are clinically very distinguishable from their benign counterpart.

Presence of neck mass usually indicating cervical lymphadenopathy is the sign of metastatic disease. The lymphatic drainage from the tonsil or oropharynx in general is mainly to levels II, III and IV, with an emphasis on the jugulodigastric node in level III. Some authors even advocate tonsillectomy on the ipsilateral side of the cervical node, although the tonsil appears normal with no clinical suspicion. This is done as part of the hunt for the hidden primary after an exhaustive work-up and careful follow-up over many years (Alan Kerr, 1997).

1.2 Anatomy of the Tonsil

1.2.1 Gross Anatomy

The palatine tonsil is a large collection of lymphoid tissue which projects into the oropharynx from the tonsillar fossa. The fossa is triangular in shape and is bounded by palatoglossal fold (from palatoglossal muscle) anteriorly and palatopharyngeal fold (from palatopharyngeus muscle) posteriorly. The floor of the fossa (lateral wall) is formed by the superior constrictor muscle.

The shape of the tonsil is usually described as an oval, but as it occupies a triangular space, which it completely fills, it follows that its deep part is almost triangular in shape in its normal state. The free surface varies in its appearance.

On the upper part of the tonsil, an intratonsillar cleft is found. In addition, the surface also shows numerous narrow tonsillar crypts. The inferior part of the tonsil comes into contact with the tongue and is often attached to its base.

The size of palatine tonsil varies from a person to another, depending on the age, associated pathology and others. Normally in human, the tonsil size increases between one to three years old (after exposure to antigens), peak between three to seven years old and naturally will involutes after puberty. In old age, the tonsils are small because there is little amount of lymphoid tissue left.

Clinically, the size of the tonsil can be graded as follows;

Table 1.2 : Tonsil grading according to size

Grade	Clinical examination
0	Unable to visualize tonsil
1+	Tonsil within fossa
2+	< 50 % obstruction
3+	> 50 % obstruction
4+	Tonsils touching, 'kissing tonsil'

However, if there is any associated pathology such as recurrent acute tonsillitis or chronic tonsillitis, the tonsil size might remain big. On the other hand, in some occasion, the person can have tonsillar hypertrophy although without any association with infection. Thus, the size factor alone predisposes them to have clinical problems such as snoring, obstructive sleep apnoea or dysphagia.

1.2.2 Histology

Palatine tonsils together with the pharyngeal tonsils (adenoids), lingual tonsils, tubal tonsils of Gerlach (near fossa of Rosenmuller) and minor glands on the posterior pharyngeal wall collectively form an interrupted circle of lymphoid tissue. It is named as Waldeyer's Ring. Altogether they serve the purpose as the defense group of structures located at the upper end of respiratory and alimentary tract. The role is critically important especially in paediatric age group where the systemic body protective immune mechanism is not yet reaches full maturity.

Microscopically, as in the other lymphoid tissue collection, tonsil is described into zones.

1 Reticular Cell Epithelium – squamous layer, contain antigen-presenting cells (M-cells) which transport antigen to the lymphoid germinal center
2 Extrafollicular Area – contain T cells
3 Lymphoid Follicle – composed of the Mantle Zone (mature B cells) and the Germinal Center (active B cells)

1.3 Pathology

1.3.1 Infection

Pathology of the tonsil oftenly associated with infective causes namely tonsillitis, peritonsillar abscess or quinsy, herpangina (Hand-Foot-Mouth Disease), scarlet fever, infectious mononucleosis and diphtheria. In this infective category, the one that usually requires tonsillectomy are recurrent tonsillitis and post-quinsy attack. The rest are managed with medical therapy namely antibiotic and supportive treatment.

The most common pathogens involved are Group A β-hemolytic *Streptococcus* (GABHS), *Moraxella catarrhalis* and *Haemophilus influenza.* Other less common organisms include *Bacteroides species*, *Staphylococci species*, *Escherichia coli*, diphtheria, syphilis and viral etiologies. Common viruses infecting tonsils include Epstein-Barr, Adenovirus, Influenza A and B viruses.

1.3.2 Hypertrophy

The size of the tonsil varies at different periods of life. In general, the involution of the size begins at puberty. However, in some cases, the natural down-sizing process does not occur. These individuals usually children and adolescent will present will obstructive symptoms. These include snoring, hyponasal speech, sleep apnea and foreign body

sensation in the throat. Commonly, the adenoids are enlarged as well. The symptoms presented usually consist of chronic mouth breathing, hearing impairment as the result of Eustachian tube obstruction, otitis media and 'adenoid facies'.

1.3.3 Neoplasia

Tumour of the tonsils or oropharynx in general is comparatively very rare. No figure of tonsillar cancer cases were given by the Malaysia National Cancer Registry published in 2004. Most probably it is grouped together under lymphoma. However, the incidence of tumours in oropharynx in general in United Kingdom is eight per million, but it is higher in United States of America, being sixty per million.

Squamous cell carcinoma is the most common type of neoplasm known to occur in tonsillar tissue. Lymphoma of the tonsil, which usually presents with unilateral tonsillar enlargement, is limited to non-Hodgkin's type. Rare tumours of the tonsils include extramedullary plasmacytomas, Hodgkin's disease and leukemia. As there is no afferent lymphatic channel draining into the tonsils, the incidence of metastatic neoplasms or secondaries in the tonsil are extremely rare.