ORIGINAL ARTICLE

Reappraisal of microbiological and histological evaluation of tonsillectomy specimens

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ABSTRACT

Objective. Microbiological and histological evaluation of tonsillectomy specimens has been performed routinely at our department for many years. We designed the present study to evaluate this practice.
Patients and methods. We retrospectively reviewed 402 tonsillectomies done at the otorhinolaryngology department of the Rouen Teaching Hospital from January 1999 to April 2003. Data from adults and pediatric patients were analyzed separately.
Results. Malignancies were found in 5 (1.2%) patients. These 5 patients were adults who underwent tonsillectomy for a clinical diagnosis of suspected malignancy. Microbiological studies were positive in 2% of patients. Positive microbiology was not associated with postoperative complications and did not lead to changes in management.
Conclusion. These results suggest that histological evaluation of tonsillectomy specimens could be reserved for patients with a clinical suspicion of malignancy and that routine microbiological studies are unnecessary.

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INTRODUCTION

Tonsillectomy is among the most common procedures in head and neck surgery. The many reasons for tonsillectomy differ markedly between adults and pediatric patients. Histological and microbacteriological evaluations of tonsillectomy specimens have been performed routinely in our department for many years. The present study was designed to evaluate the yield of these routine evaluations.

PATIENTS AND METHODS

Tonsillectomy specimen evaluation procedure used in our department

Dissection tonsillectomy is used in adults and pediatric patients. The right tonsil is sent to the pathology department and the left tonsil to the microbiology laboratory.
However, in patients with peritonsillar abscess, the tonsil on the side of the infection is sent to the microbiological laboratory and the other tonsil to the pathology department. Furthermore, tonsils with gross features suggesting a tumor are sent to the pathology department; thus, both tonsils may be subjected to a pathological evaluation.
Analgesics and a special diet are used during the postoperative period. Antibiotics are given routinely only to those patients undergoing tonsillectomy for an active peritonsillar abscess. Patients who are free of complications and have normal findings from a local examination are discharged after 48 hours. Reasons for surgery will not be discussed here.

Population

The database maintained by the Rouen Teaching Hospital was searched for cases of tonsillectomy performed between January 1999 and April 2003.
The Rouen Teaching Hospital has a pediatric otorhinolaryngology department for patients aged 16 years or younger and an adult otorhinolaryngology department for patients older than 16 years. Data from both departments were searched. This identified 402 patients, whose database records were reviewed retrospectively. Source documents were checked when unusual features were noted.

RESULTS

Of the 402 patients, 300 were 16 years or younger and 102 were adults.

Histological evaluation

Table I details the histological findings.

- We excluded 21 (5%) patients (19 pediatric patients and 2 adults) with missing data; none of these patients had unusual diagnoses or postoperative complications. Malignancy was found in 5 adults.
- There were

  - three cases of squamous cell carcinoma (3% of adults and 0.75% of all patients) and

  - two cases of lymphoma (2% of adults and 0.5% of all patients).

In these 5 patients, a clinical suspicion of malignancy led to panendoscopy followed by tonsillectomy to obtain histological confirmation; furthermore, the gross appearance of the excised tonsil was consistent with a malignancy.

Microbiological evaluation

Table II reports the microbiological findings. Again, 21 patients with missing data were excluded.

Table I. Results of routine histological evaluation of tonsillectomy specimens

	Adults (n=102)	% Adult	Children (n=300)	% Pédiatric patients	% Total (n=402)
Tonsillitis	95	93.1	275	91.6	92.0
Squamous cell cancer	3	2.9			0.7
Non-Hodgkin lymphoma	2	1.9			0.5
Lymphoid hyperplasia	0		6	2.0	1.5
Missing data	2		19	5.6	4.2

Commensals included staphylococci, streptococci (alpha-hemolytic or nonhemolytic), *Moraxella catarrhalis,* various Gram-positive and Gram-negative bacilli, various Gram-positive cocci, and yeasts. Noncommensal bacteria were found in only 8 (2%) patients (Table II), none of whom experienced postoperative complications in the short or medium term. The reason for tonsillectomy was tonsil hypertrophy with upper airway obstruction in 3 patients and chronic tonsillitis in 5 patients. None of the 8 patients had peritonsillar abscess.

Tableau II : Résultats de l'analyse bactériologique

	Adults (n=102)	% Adult	Children (n=300)	% Pédiatric patients	% Total (n=402)
Commensal organisms	100	98	281	94.0	95.0
Klebsiella pneumoniae	1	1		0.0	0.2
Streptococcus pneumoniae			1	0.3	0.2
Pseudomonas aeruginosa			3	1.0	0.7
Streptococcus agalactae			1	0.3	0.2
Morganella morganii			1	0.3	0.2
Escherichia coli			1	0.3	0.2
Missing data	2	2	19	6.0	5.0

DISCUSSION

The palatine tonsils are the main components of Waldeyer's lymphoid ring. They are lined with nonkeratinized epithelium continuous with the oropharyngeal mucosa. A difference with lymph nodes is the absence of afferent or efferent lymphatics [1]. Size is greatest during childhood and decreases during adolescence. Acute and chronic forms of tonsillitis are common in pediatric patients and adults. The substantial loss of school or work days related to tonsillitis creates a major financial burden for society.

Our standard protocol involves routine histological and microbiological evaluation of tonsillectomy specimens. This practice required reappraisal, as it was not based on scientific data. Furthermore, the selection of tonsils for histology and microbiology in each patient was not performed at random. The clinical features and gross appearance were used to guide the histological study.

Routine histological evaluation

Malignancies of the tonsil are distributed as follows [2]:
- Squamous cell carcinoma, 80-85%;
- Lymphoma, 15-20%;
- Metastases, 1%;
- Miscellaneous, 5%.

Clinically, asymmetric tonsil hypertrophy may be difficult to distinguish from lymphoma, and the diagnosis in this uncommon situation is made upon histological examination of the tonsillectomy specimen.

The low incidence of malignant tonsil lesions has prompted a search for criteria suggesting malignancy. Thus, Beaty et al, [3] and Berkowitz et al, [4] found that malignancy was associated with
- History of head-and-neck malignancy or radiation
- Tonsil asymmetry
- Palpable lesion or lesion visible to the naked eye
- Lymph node enlargement
- Failure of appropriate medical treatment for an infectious episode.

Table III recapitulates the main findings from published studies.

In a study of 2438 patients (2099 pediatric patients) conducted by Younis et al, there were only 40 (1.7%) malignancies (34 cases of squamous cell carcinoma and 6 lymphomas) [5], all of which were suspected preoperatively. Thus, Younis et al, suggested discontinuing routine histological evaluations. Netser et al, obtained similar results in a study of 2771 patients [6]. Smaller studies by Alvi et al, [7] and Ikram et al, [8] led to the same conclusion. Strong et al found no

Table III. Published data on histological evaluation of tonsillectomy specimens

Authors	Number of patients	Population	Malignancies	Need for routine histology
Younis et al [5]	2438	86% pediatric	41	No
Netser et al [6]	2771		30	No
Alvi et al [7]	288		1	No
Strong et al [9]	1583	100% pediatric	0	No
Ikram et al [8]	400		1	No
Ridgeway et al [10]	6	100% pedriatric	6	Yes

malignancies in a pediatric population and stopped performing routine histological evaluations [9].

A single study, by Ridgeway et al, [10], strikes a discordant note.
With routine histological evaluation of tonsillectomy specimens in pediatric patients, Ridgeway et al, found 6 cases of unsuspected lymphoma over a 13-year period.
However, a review of these 6 cases shows that the malignancy criteria listed above were present. In addition, the study included only those cases showing histological abnormalities, without comparing them to the overall population seen during the study period.
In keeping with the literature, we found that malignancies were uncommon, occurred only in adults, and were consistently suspected before surgery. Therefore, routine histology is probably unnecessary. Histological evaluation should be reserved for patients with clinically suspected cancer.

Routine microbiological study

Commensal organisms have been investigated in several studies [11-14]. They consisted chiefly of staphylococci, a-hemolytic or nonhemolytic streptococci, *M. catarrhalis, Neisseria, Haemophilus influenzae,* and Candida albicans, in keeping with our findings. Other organisms are present (*e.g., Escherichia coli, Fusobacterium, Lactobacillus,* and *Peptococcus*) in fewer than 10% of tonsillectomy specimens.

The classification of streptococci rests on three characteristics: appearance of the hemolytic reaction surrounding the colonies on blood agar, antigen specificity (Lancefield groups), and biochemical properties. Alpha-hemolysis is partial greenish hemolysis (Streptococcus viridans), whereas beta-hemolysis is complete lysis producing a clear zone. Most of the alpha-hemolytic streptococci are commensals, as are most nongroupable streptococci. In contrast, most of the streptococci responsible for acute infections are beta-hemolytic, making the hemolysis test valuable in everyday practice.
The antigenic specificity of the cell wall polysaccharide (C substance or group carbohydrate antigen) can be used to define 19 groups, as first established by Lancefield. The groups are named by consecutive letters (A, B, C etc.), and strains that lack the C substance are called “nongroupable” strains.
The classification criteria can be combined to separate several categories of streptococci; thus, pyogenic streptococci are beta-hemolytic and include the most pathogenic species, such as groups A, B, C, and G. Most of the oral streptococci (formerly called viridans) are alpha-hemolytic or non-groupable; however, S. pneumoniae (pneumococcus) is alpha-hemolytic.

Postoperative infection is not a common complication of tonsillectomy. To our knowledge, there is no evidence that colonization with pathogenic bacteria is associated with greater pain severity or bleeding after tonsillectomy [15].

In our study, a pathogenic bacterial strain was found in 8 patients upon routine microbiological evaluation of tonsillectomy specimens. However, this finding did not require a change in treatment, and none of the 8 patients experienced complications. Thus, the risk of complications seems unrelated to the presence of bacterial colonization.

Our results and data from the literature indicate that routine microbiological evaluation of tonsillectomy specimens is unnecessary. The need for antibiotic therapy should be determined based on the appearance of the tonsillectomy sites and the presence of clinical symptoms (fever, severe pain, aphagia, otalgia).

CONCLUSION

The findings from this study and from our literature review indicate that routine histological and microbiological evaluation of tonsillectomy specimens is unnecessary; these evaluations substantially increase the cost of tonsillectomy without providing benefits to the patients.

A high level of alertness should be maintained in order to detect high-risk patients likely to benefit from histological and microbiologic investigations. High-risk patients are those with any of the following [3-4]:

- History of head-and-neck cancer or neck radiation,
- Asymmetric tonsil,
- Lesion visible to the naked eye or palpable,
- Lymph node enlargement,
- Failure of appropriate medical treatment for an infectious episode.

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