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Routine pathological evaluation after tonsillectomy: is it necessary?

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Abstract. *Routine pathological evaluation after tonsillectomy: is it necessary? Objectives*: There is still no consensus regarding the necessity of sending every tonsil specimen for histological examination following tonsillectomy. To add to this discussion, we assessed the incidence of preoperatively unexpected malignancy in the postoperative tonsil specimens of adults and children in our ENT department.
Methods: We conducted a retrospective study of the histopathology results of all patients who underwent tonsillectomy between January 1999 and February 2006 in the ENT department of East Limburg Hospital in Genk. The charts of patients with postoperative histopathological malignancy were further analysed and reviewed for preoperative indications of the tonsillectomy and for preoperative suspicion of malignancy.
Results: A total of 2989 patients were included in the study: 2058 children (defined as 16 years or younger) and 931 adults. No malignancy was found among the children. In 20 adults, malignancy was diagnosed, but in all cases there was a preoperative suspicion of malignancy. No patient without preoperative risk factors was found to have malignancy on pathological evaluation of the tonsils.
Conclusion: Our results indicate that routine histopathological examination of tonsils removed for benign disease in adults and children is clinically unnecessary. We propose that on an individual basis, the surgeon should decide the need for histological examination depending on preoperative risk factors and peroperative gross examination. Such a strategy will only be medicolegally possible where there are national and scientifically (evidence)based ENT consensus reports or guidelines on this issue.

Introduction

Despite a remarkable reduction over the past decades, tonsillectomy remains one of the most commonly performed surgical procedures in ENT practice.[1-3] It is performed for several different reasons in both adults and children. Surgical indications include recurrent or chronic tonsillitis, peritonsillar abscesses, snoring, and obstructive sleep apnoea. Suspected neoplasia and the need for biopsy to exclude systemic diseases are other indications.[4]

In many hospitals, it is almost standard practice to submit all surgical specimens for pathological diagnosis. The risk of possibly missing an occult neoplasm and the medicolegal implications of such an oversight argue in favour of processing every specimen.[5] On the other hand, the incidence of tonsil malignancy is so rare, especially in the absence of preoperative clinical suspicion, it may be an unnecessary expenditure of health care resources.[1] In times when cost-effectiveness has become an important issue for deciding optimal medical care, the necessity for routine microscopic evaluation of tonsil specimens has been questioned more and more by many otorhinolaryngologists.[2]

The purpose of this study was to investigate the incidence of unexpected malignancy in all tonsillectomy specimens of children and adults over the course of seven years and to evaluate the necessity for histopathological evaluation as a routine practice in every case of tonsillectomy. We also discussed the clinical preoperative signs of suspicion for malignancy.

Materials and methods

We performed a retrospective study of the histopathology results for all patients, children and adults, who had undergone tonsillectomy surgery between January 1999 and February 2006 at the ENT department of East Limburg Hospital in Genk. All records were analysed for data on patient age and sex and the result of the histopathological examination of the tonsils. A code derived from the "Leidse Code®" was used for histological classification (CODAP 1999 code, Leuven KUL). In addition, patients operated with a high suspicion of

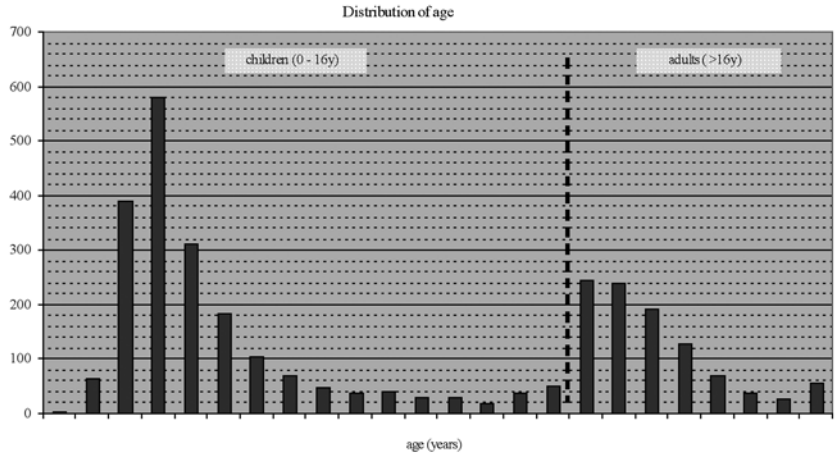

Figure 1
Distribution of age

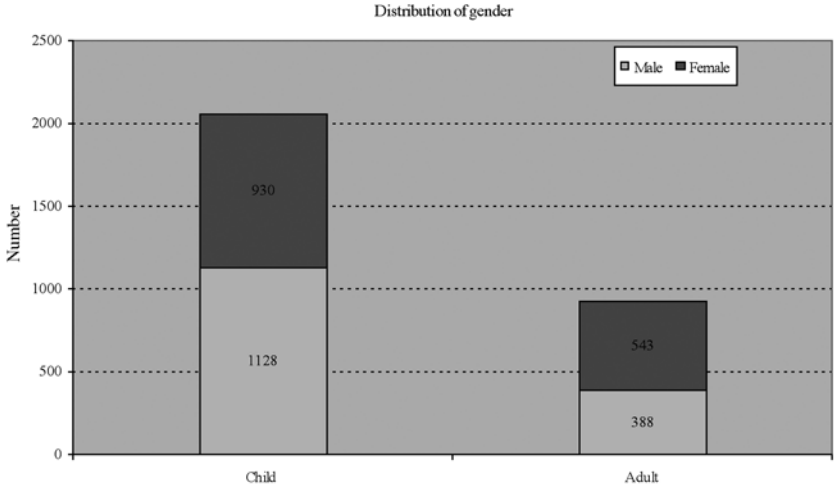

Figure 2
Distribution of gender

malignancy were included in the study.

The charts of patients with postoperative histopathological malignancy were further analysed and reviewed for preoperative indication of the tonsillectomy and for preoperative suspicion of malignancy. The following risk factors were evaluated: a history of cancer, tonsillar asymmetry, palpable firmness or visible lesions of the tonsil, neck masses, and clinical signs or symptoms suggestive of malignant disease, such as unilateralism of signs. In a few cases, there was a suspicious preoperative biopsy of the tonsil or an adenopathy.

All tonsil specimens were fixed with formalin, embedded in paraffin, and stained with haematoxylin and eosin. Two representative sections were taken from each tonsil and examined under light microscopy.

Results

A total of 2989 patients were included in the study. The mean age was 12 years and 10 months with a range from 6 months to 85 years and 2 months (Figure 1). The patients were divided into two groups: the paediatric group, defined as 16 years old or younger (n = 2058, 69%) and the adult group, older than 16 years (n = 931, 31%). Of all patients, 1516 (51%) were males (Figure 2). All histopathological diagnoses of the patients are shown in Table 1.

We used the CODAP 1999 code to classify the pathological diagnoses into five groups: normal histology/oedema, inflammation/infection, degeneration/abnormal growth, benign tumours, and malignant tumours.

In 97.1% of the cases, pathology showed inflammation or tonsillitis. In 39 patients, *Actinomyces* was found in the specimens. Sixty-one patients had a more unusual diagnosis, and the distribution of these is shown in Figure 3. Degeneration or abnormal growth, such as atypia, atrophy, or fibrosis, was found in 15 patients.

Benign tumours such as papilloma, fibroma, and mixed tumour were detected in the tonsil specimens of six adults. In 20 cases, malignancy was diagnosed. All cases were in adults and in each case there was a preoperative suspicion of malignancy (Table 2).

Non-Hodgkin lymphoma was diagnosed in six patients. Preoperative suspicion in these cases was based on tonsil asymmetry, a suspicious adenopathy, history of previous lymphoma, or history of non-Hodgkin lymphoma in the parotid gland.

In 12 patients there was a squamous cell carcinoma of the tonsil. Sore throat, earache, and erosion of the pallatum molle, tongue base, or tonsil were preoperatively seen in these patients. In two

Table 1
Pathological results of the tonsil specimens

Pathological diagnosis	Code	Child	Adult	Total (number)
Normal/oedema		27	18	45
*normal	02/03	27	16	43
*oedema	15	–	2	2
Infection/inflammation		2002	901	2903
*non specific	20	161	52	213
*acute	21	742	396	1138
*chronic	22	1082	406	1488
*scar	24	1	–	1
*granulation	25	–	4	4
*erosion	26	–	5	5
*ulcerous	27	–	2	2
*abscess	28	2	6	8
*foreign body	29	1	–	1
*presence of bacteria	34	–	2	2
*Actinomyces	35AC	12	27	39
*presence of virus	36VV	1	–	1
*food rests	38	–	1	1
Degeneration/abnormal growth		7	8	15
*atrophy	41	–	2	2
*fibrosis	43	1	1	2
*atypia	53, 60	1	1	2
*cyst	54	2	2	4
*hyperplasia	56	2	1	3
*polyp	57	1	1	2
Benign tumours		0	6	6
*fibroma	61	–	1	1
*papilloma	73	–	4	4
*mixed tumour	74	–	1	1
Malignant tumours		0	20	20
*non-Hodgkin lymphoma	83	–	6	6
*squamous cell carcinoma		–	12	12
low differentiated	*91WG*	–	*5*	*5*
intermediate differentiated	*91MG*	–	*4*	*4*
well differentiated	*91GG*	–	*1*	*1*
unknown differentiation	*91*	–	*2*	*2*
*mucoepidermoid carcinoma	93ME	–	1	1
*undifferentiated large-cell carcinoma	96	–	1	1

cases, there was a suspicious neck adenopathy that was on biopsy a metastasis of a squamous cell carcinoma. In one of them, a positron emission tomography scan showed a hot spot in the tonsillar region. Preoperative CT was performed in one patient, and in three cases a biopsy of the suspicious tonsil was taken.

We had one patient with a mucoepidermoid carcinoma who preoperatively had a sore throat with a normal clinical ENT examination, but on CT had a tonsillar tumour. An undifferentiated carcinoma was found in one patient but also with preoperative suspicion of malignancy.

Discussion

Tonsillectomy is one of the most commonly performed surgical procedures.[1-3] However, there is still no clear consensus in the literature and in clinical practice with regard to the optimal strategy for pathological examination of tonsil specimens. Some otorhinolaryngologists send all tonsil specimens for pathological examination. Others send only the tonsillar specimens of adults for examination, and a third group sends tonsils to be examined histologically only in cases of suspicion of malignancy or a specific rare diagnosis, like sarcoidosis.[3,6]

In the present study, the pathological results of the tonsil specimens of 2989 patients were reviewed. No unexpected malignancy was found, either in the paediatric group or in the adults who were operated for a preoperative benign disease. In 20 adults with a preoperative suspicion of malignancy, a malignant tumour was found. The reported incidence in the literature of unexpected malignancy varies between 0%[1,6-8] and 0.18%[2] in children and between 0%[1,9,10] to 0.28%[3,11,12] in adults. In some studies,[4,5,13,14] postoperative malignancy was found, but with preoperative suspicious risk factors.

In the literature, there are many arguments in favour of and against routine examination of the tonsils. The extremely low frequency of unexpected malignancy, especially among children, has led some authors to speculate that routine examination of tonsil specimens can lead to unnecessary costs and consumption of resources and time.[1,9]

The official cost in Belgium for microscopic evaluation of the tonsils in a patient under 18 years is (in 2006) € 26.55, and in patients older than 18 years, it is € 119.47. The total cost of microscopic

Table 2
Preoperative suspicious signs in the 20 adults with malignancy

Gender	Age	Code	Pathological diagnosis	Preoperative suspicious factors					
				history of cancer	subjective symptoms**	tonsillar asymmetry	tonsil/palatum lesion, firmness	lymph nodes	other suspicious factors
			non-Hodgkin lymphoma (NHL)						
M	75	83				*	*		
M	69	83				*	*		
F	48	83			*		*		sister with lymphoma
F	63	83		*	*				
M	51	83						*	
M	66	83		*		*			
			squamous cell carcinoma (SCC)						
M	61	91	*unknown differentiation*		*				biopsy tonsil
F	55	91			*				biopsy tonsil
M	71	91 GG	*well differentiated*		*		*		
M	43	91 MG	*intermediate differentiated*		*		*		
M	48	91 MG				*	*		
M	54	91 MG			*		*		biopsy
M	85	91 MG			*	*			
M	57	91 WG	*low differentiated*					*	PET, biopsy adenopathy
F	70	91 WG			*		*		
M	56	91 WG				*	*		CT
F	68	91 WG						*	
M	63	91 WG			*		*		
F	64	93 ME	mucoepidermoid carcinoma		*	*			CT
F	54	96	undifferentiated large-cell carcinoma		*	*			

Legend
M: male, F: female, y: years, Ca: carcinoma, CT: computed tomography, PET: positron emission tomography
**: earache, sore throat, dysphagia.

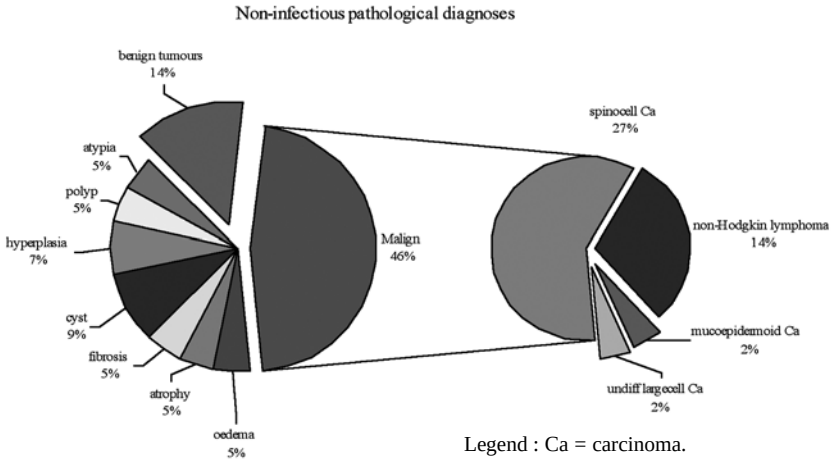

Figure 3
Distribution of non-infectious pathological diagnoses

diagnosis of the children in this series, given in 2006 costs, was 2131 × € 26.55 = € 56,578; for the adults, the cost was 858 × € 119.47 = € 102,505. No unexpected malignancy was found in any of those cases. Assuming a rate of 0.06% of unexpected malignancy,[1,2] the detection of a single case of unexpected malignancy would cost € 44,250 for a child and € 199,117 for an adult. However, this apparently extremely high cost should be balanced with the increased survival rate that would be achieved by an early diagnosis. Further specific studies are required to investigate the impact on survival of a delayed diagnosis and to draw economic conclusions about the necessity of histological examination in this context.[2]

The incidence of unexpected malignancy is low but, on the other hand, it is not zero. Garavello *et al.*[2] identified two cases of occult lymphoma in children. Alvi *et al.*[15] found in a subgroup of 103 patients one occult lymphoma in a man of 65 with a history of peritonsillar abscess.

Table 3
Predictive preoperative risk factors for malignancy

Symptom/clinical feature	***p* value**		**Statistically significant risk factor**
	Beaty *et al.*[4]	**Spinou *et al.*[16]**	
History of cancer	< 0.0001		Yes
Swelling first noticed by patient		< 0.0001	Yes
Age ≥ 45 years		< 0.0001	Yes
Male sex		0.0016	Yes
Tonsillar asymmetry	< 0.0001		Yes
Tonsil firmness/lesion/ulceration	< 0.0001	0.0003	Yes
Lymph nodes/neck mass	< 0.0001	0.056	Yes
Weight loss	< 0.0001		Yes
Constitutional symptoms	0.003		Yes
Pain		0.707	No
Smoking		1	No

Therefore, there will always be an argument in favour of histopathological examination of routine tonsillectomy specimens.

The concern about missing an occult malignancy and the question of what the consequences are of a delayed diagnosis in terms of survival and financial costs will continue to exist.[2] Another problem is the lack of pathological analysis of the tonsils in case of the occurrence of a metastatic cervical lymph node, for which the primary tumour remains occult, a year after throwing away the tonsils after tonsillectomy. Even though the tonsils may not have contained a malignancy at tonsillectomy, the lack of pathological analysis could allow a patient to initiate legal action for medical malpractice because of a possible delayed diagnosis.

Others argue that the pathological analysis of surgical specimens primarily serves to guide the treatment of the patient but also serves as a quality-control measure to ensure that the documented procedure has been performed.[3,5,8] It is also an educational tool to confirm a presumed diagnosis[3] and to train the pathologist to become proficient in recognizing normal and benign histology. The abolition of the old established method has also ethical consequences: the surgeon becomes responsible for the decision about whether or not a histological examination is necessary for each individual case.[8] In general, most authors conclude that it is very important that all patients be carefully evaluated before surgery by means of an accurate history and a complete clinical head and neck examination to detect any evidence of malignancy.

Beaty *et al.*[4] investigated preoperative risk factors for malignancy in adults. Significantly correlated with the presence of malignancy were a history of cancer, tonsillar asymmetry, palpable firmness or visible lesions of the tonsil, a neck mass, and clinical signs or symptoms suggestive of malignant disease such as unilateralism of signs and symptoms like unexplained weight loss, fatigue, night sweats, fevers, and anorexia (Table 3). Multiple risk factors found in an individual were significantly correlated with a greater likelihood of malignancy. In their study, patients without any risk factors were never identified as having a malignant lesion. Current smoking and persistent pain were not significantly associated with malignancy in the study of Spinou *et al.*[16] In our study, all patients with a malignancy had preoperatively one or more risk factors (Table 2).

However, in the case of unilateral tonsil hypertrophy, physicians must weigh the discomfort and risk associated with tonsillectomy against the risk of malignancy. Different studies have investigated the incidence of occult malignancy in asymptomatic tonsil asymmetry.[10,13,16-18] Syms *et al.*[13] found an incidence of carcinoma in incidental tonsil asymmetry of 4.8%, and Reiter *et al.*[10] found a frequency of 6.5%. However, all patients had additional risk factors, such as rapid growth and asymmetry noticed by the patient. Asymmetry without any other risk factor is not an indication for histological evaluation.[16,18]

Based on our data and that of Beaty *et al.*,[4] we think that a pathological examination of the tonsils should always be performed in case of clinically suspicious factors like a history of cancer, tonsillar asymmetry, firmness, lesion or ulceration, lymph nodes, neck masses, and clinical signs or symptoms suggestive of malignant disease (e.g., unexplained weight loss, fatigue, night sweats, fevers, and anorexia).

Conclusion

Based on the present observations, microscopic examination of all

routine tonsil specimens is not necessary. For each case, a gross examination and preoperative complete history with clinical examination should be performed to assess the presence of risk factors for malignancy. In this new strategy, the surgeon becomes responsible for the decision of whether a histological examination is necessary for each individual case. Therefore, it is necessary to develop a national and scientifically based ENT consensus report or guideline on this issue to guide the surgeon in daily practice and to provide medicolegal support.

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