

Is the pathological examination of routine tonsillectomy and adenoidectomy specimens necessary? A retrospective study of 559 adenoidectomy and 1132 tonsillectomy specimens and a literature review

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Abstract. *Is the pathological examination of routine tonsillectomy and adenoidectomy specimens necessary? A retrospective study of 559 adenoidectomy and 1132 tonsillectomy specimens and a literature review.*

Objective: There is still no consensus about the necessity of histopathological analysis of routine tonsillectomy and adenoidectomy specimens. In this study, our goal was to determine the incidence of unexpected pathological findings in routine tonsillectomy and adenoidectomy specimens. The results are discussed in the light of current literature.

Materials and methods: The patient data were obtained from the archives of the departments of otorhinolaryngology and pathology. Between November 1992 and July 2006, chronic, recurrent infections or obstructive problems led to bilateral tonsillectomies, adenoidectomies, and adenoidectomies plus tonsillectomies being performed in 435, 502, and 770 patients respectively. Five hundred and fifty-nine of 1272 adenoidectomy specimens and 1132 of 2410 tonsillectomy specimens were sent to the department of pathology for histopathological examination.

Results: The histopathological results for all the adenoidectomy specimens reported chronic inflammatory processes. Only one of 1132 tonsillectomy specimens involved granulomatous inflammation, while 1131 were chronic inflammatory processes.

Conclusion: On the basis of the result of our study and review of the published literature, the microscopic analysis of routine tonsillectomy and/or adenoidectomy specimens may not be necessary, especially in young patients with no clinically suspicious factors for malignancy. However, all patients must be carefully examined for evidence of malignancy before surgery.

Introduction

Tonsillectomy with or without adenoidectomy is one of the most common surgical procedures in otorhinolaryngology practice. While only a few patients with findings associated with neoplasm undergo tonsillectomy and/or adenoidectomy, these procedures are performed mostly for patients' chronic, recurrent infections, or obstructive problems. If the surgery is a result of a suspicion of neoplasia, the pathological examination of the specimen is required. However, there has been some recent discussion about the need for the routine histopathological examination of adenoidectomy or

tonsillectomy specimens taken for non-neoplastic reasons.¹⁻¹⁵

In this retrospective study, we reviewed the histopathological results of specimens of the patients who underwent tonsillectomy and/or adenoidectomy in our tertiary referral clinic between November 1992 and July 2006 in the light of current literature.

Materials and methods

A retrospective review was conducted of all patients undergoing tonsillectomy and/or adenoidectomy at the Inonu University Medical Faculty Department of Otorhinolaryngology (Malatya, Turkey) between November 1992

and July 2006. A total of 1707 patients, 789 female and 918 male, underwent surgery during this period. Chronic or recurrent infections, or obstructive problems led to bilateral tonsillectomy in 435 patients (234 female and 201 male), adenoidectomy in 502 patients (226 female and 276 male), and bilateral tonsillectomy plus adenoidectomy in 770 patients (329 female and 441 male). We confirmed that 559 of 1272 adenoidectomy specimens and 1132 of 2410 tonsillectomy specimens were sent to the department of pathology for histopathological examination. Adenoidectomy only was the surgery for 221 of these patients (87 female and

134 male), while 228 patients (112 female and 116 male) underwent bilateral tonsillectomy, and 338 patients (143 female and 195 male) underwent bilateral tonsillectomy plus adenoidectomy. All these surgeries were for non-neoplastic reasons. The mean age of patients was 5.9 (range from 2 to 18 years, median 7) in the adenoidectomy group, 6.8 (range from 2 to 16 years, median 6) in the tonsillectomy plus adenoidectomy group, and 16.9 (range from 4 to 44 years, median 18) in the tonsillectomy group.

During the same period, 20 patients (7 female and 13 male) underwent diagnostic tonsillectomy as a result of findings associated with neoplasm. The defined risk factors associated with neoplasm were tonsil asymmetry, neck mass, and visible tonsillar lesion. A total of 25 specimens (5 bilateral and 15 unilateral tonsillectomy) were sent to the department of pathology for histopathological evaluation. The mean age in this group was 49 (range from 25 to 80 years).

All tonsil and adenoidectomy specimens were fixed with 10% buffered formalin, embedded in paraffin, sliced into 5 µm thick sections and stained using haematoxylin and eosin. At least four representative sections were taken from each tonsil or adenoid and evaluated with light microscopy (BX50, Olympus Corporation, Tokyo, Japan).

Results

All patients undergoing adenoidectomy with or without tonsillectomy were 18 years of age or younger. 112 of the 228 patients undergoing tonsillectomy only were older than eighteen (range

from 19 to 44; mean 28.6) and the remaining 116 were younger than 18 years (range from 4 to 18; mean 11.3).

The histopathological results for all the adenoidectomy specimens reported chronic inflammatory processes. Only one of the 1132 tonsillectomy specimens was reported as granulomatous inflammation. This patient was a 20-year-old female and her surgery was for chronic tonsillitis. The histopathological investigation reported a chronic inflammatory process in the right tonsil and granulomatous inflammation in the left tonsil (Table 1).

The results of the histopathological evaluation of the specimens from the patients with risk factors for neoplasm were different. The evaluation of fifteen of the 25 specimens reported lymphomas, one reported a non-keratinising squamous cell carcinoma, one an undifferentiated carcinoma, four found granulomatous inflammations, one reported a benign tonsillar cyst, and three indicated chronic inflammatory processes.

Discussion

Tonsillectomy and/or adenoidectomy are two of the most commonly performed surgical

procedures in otorhinolaryngology clinics all over the world. Chronic or recurrent infections, peritonsillar abscess, obstructive sleep apnoea and snoring are common indications for tonsillectomy and/or adenoidectomy.¹⁶ The other indication is malignancy. Apparent risk factors for tonsillar malignancy are tonsillar asymmetry, firmness, unexplained neck mass, prior history of head and neck cancer, visible or palpable lesion or ulceration in the tonsil, and unexplained weight loss.^{3,12}

Some otolaryngologists send all surgical specimens to the laboratory for pathological evaluation. Others send specimens only when there are risk factors. There have been some studies of the results of histopathological analysis of tonsillectomy and/or adenoidectomy specimens (Table 2). There is no discussion about the pathological evaluation of specimens in cases of surgery associated with risk factors for tonsillar malignancy. However, there is some debate about the need for the histopathological examination of specimens when surgery is performed for non-neoplastic reasons. The discussions focus on cost-effectiveness, time constraints, unexpected pathology such as tumour or granulomatous diseases and medico-legal problems.

Table 1
Results of the current study

	Patients without risk factors	Unsuspected diagnosis	
		n	
Adenoidectomy	221	0	
Tonsillectomy & Adenoidectomy	338	0	
Tonsillectomy	228	1	Granulomatous inflammation

Table 2

Literature review of the results of histopathological analysis of tonsillectomy and/or adenoidectomy specimens

	Cases	Unexpected diagnosis		
	N	n	%	
<i>Strong et al.</i> ¹	1583	0	0	
<i>Dewil et al.</i> ³	2989	0	0	
<i>Yasan et al.</i> ⁴	1184	0	0	
<i>Ikram et al.</i> ⁵	200	0	0	
<i>Erdag et al.</i> ⁶	2743	0	0	
<i>Younis et al.</i> ⁸	2099	0	0	
<i>Beaty et al.</i> ¹²	383	0	0	
<i>Dost</i> ¹⁴	400	0	0	
<i>Williams and Brown</i> ¹⁵	4070	0*	0*	
<i>Schrock et al.</i> ¹¹	1523	2	0.13	Lymphoma, epithelial carcinoma
<i>Verma et al.</i> ¹⁷	2062	4	0.19	Squamous epithelial lined cysts; necrotising granuloma, and inflammation
<i>Dell'Aringa et al.</i> ¹⁰	250	1	0.4	Granulomatous inflammation
<i>Alvi and Vartanian</i> ²	576	1	0.17	Lymphoma
<i>Dohar and Bonilla</i> ⁷	2012	1	0.05	Glycogen storage disorder
<i>Garavello et al.</i> ⁹	1123	2	0.18	Non-Hodgkin's lymphoma
<i>Current Study</i>	787	1	0.13	Granulomatous inflammation

* 3 cases had clinically significant pathological diagnosis with pre-operative risk factors.

*Strong et al.*¹ discussed the results of their clinic's retrospective analysis of routine tonsillectomy and/or adenoidectomy specimens in patients under the age of 18 years. Even though they reported no occult malignancies in specimens of a total of 1582 paediatric patients, they recommended, after their discussion against the background of published literature, sending routine tonsillectomy specimens for full pathological analysis on a case-by-case basis. The criteria they listed for full microscopic examination in paediatric patients were tonsillar asymmetry, mucosal irregularities, immunocompromise, clinical signs of malignant disease or other risk factors for malignancy such as tobacco, alcohol, and previous malignancy. They also suggested sending all adult specimens for full histological analysis.

*Ikram et al.*⁵ reported their retrospective results for 400 tonsillectomy specimens removed

from 200 patients and noted one malignancy (a non-Hodgkin's lymphoma) in one tonsillar specimen of a patient with asymmetric tonsils and a history of smoking. Even though their institution's policy requires routine histopathological analysis, they concluded, on the basis of the results of their study and a review of the literature, that routine histological examination is unnecessary in the absence of pre-operative risk factors, and serves only to increase costs and divert man-hours.

*Younis et al.*⁸ looked at the results of the histopathological findings for 2099 paediatric patients and 339 adults. There were no unusual histopathological findings for any of the children. Even though 11.8% of the specimens in the adult group were reported as malignancy (squamous cell carcinoma and lymphoma), all these patients had been scheduled for tonsillectomy for suspected malignancy. These

authors reported that, especially in the paediatric age group, histopathological evaluation may not be required on every patient.

*Dewil et al.*³ conducted a retrospective study of tonsillectomies in 2053 children and 931 adults. No malignancy was found in the children. Even though malignancy was diagnosed in 20 adults, all of these cases had some pre-operative risk factors for malignancy. They concluded that, if the tonsil removed for benign disease in adults and children, routine histopathological examination is clinically unnecessary.

The study from *Erdag et al.*⁶ produced the same result in a group of 2743 paediatric patients. Their histopathological evaluations found no malignancies in the tonsillectomy or adenoidectomy groups.

The other study of the pathological results for 453 adult tonsils found no unsuspected results.¹² Of the remaining 383 patients with

no risk factors identified, none had histopathological malignancy. Twenty-five of 70 patients with at least one of the risk factors were found to have malignant pathology on the basis of histological examination.

In the Dost¹⁴ study, none of the 400 patients were found to have unsuspected malignancies. The same is true of Williams and Brown's study.¹⁵ They studied a database with 4070 young patients and reported that only three of these patients had clinically significant pathological processes such as lymphoma. These patients also had pre-operative risk factors. The authors did not recommend routine microscopic examinations in younger patients.

Yasan *et al.*⁴ studied 1184 routine adenoidectomy specimens to determine the incidence of occult pathology and found no patients with unexpected pathology.

In a few studies, such as Alvi and Vartanian,² Garavello *et al.*,⁹ Dohar and Bonilla,⁷ Schrock *et al.*,¹¹ and Verma *et al.*,¹⁷ the authors noted unexpected diagnoses after routine tonsillectomy. Dohar and Bonilla⁷ looked at the results from Pittsburgh Children's Hospital. They found no significant pathological diagnosis in 1985 children undergoing tonsillectomy and adenoidectomy. They reported one lymphoma suspected before surgery and one glycogen storage disorder unsuspected in 27 children undergoing tonsillectomy only. The extremely low incidence of unsuspected diagnosis led these authors to recommend reserving microscopic evaluation for specific clinical indications. Garavello *et al.*⁹ noted two unsuspected results (non-Hodgkin's lymphoma) in 1123 patients. They found that unsuspected tonsil pathologies

were uncommon in paediatric patients but not extremely rare. Similarly, Schrock *et al.*¹¹ reported two occult tonsil malignancies in 1523 patients (a 0.13% ratio) and Verma *et al.*¹⁷ discussed four unexpected but not clinically significant diagnoses in 2062 patients undergoing routine tonsillectomy with or without adenoidectomy. Two of their pathological diagnoses were squamous epithelial-lined cyst, one was necrotising granuloma and the other was necrotising inflammation.

Alvi and Vartanian² reported the results from 576 tonsil specimens in their retrospective study. They performed their study in two groups: 370 tonsil specimens evaluated macroscopically only and 206 specimens evaluated microscopically. They reported only one malignancy diagnosis (a lymphoma) after a pre-operative diagnosis of peritonsillar abscess in a 65-year-old man. They suggested adding older age categories to general indications for the routine microscopic examination of tonsillectomy specimens. They also discussed the possibility that the routine histological examination of tonsillectomy specimen results in the unnecessary consumption of resources and time.

In another study from Brazil, the authors reported the results for specimens taken from 236 children and 14 adults undergoing tonsillectomy and adenoidectomy.¹⁰ They found one specimen indicating granulomatous inflammation but it is not clear whether this was in the paediatric adult group. No cases of malignancy were found in these patients. Despite the low rate of unsuspected diagnosis, the authors advised routine pathological examination on legal and ethical grounds.

Conclusion

The result of our retrospective study is similar to the results in the literature. The incidence of tonsillar malignancy is extremely rare, especially in the absence of any clinical indication. On the basis of our results and our review of the literature, the microscopic analysis of routine tonsillectomy and/or adenoidectomy specimens may not be necessary, especially in young patients in whom there are no clinically suspicious factors suggesting malignancy. However, we agree with most authors that all patients must be carefully examined for evidence of malignancy before surgery.

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References

1. Strong EB, Rubinstein B, Senders CW. Pathologic analysis of routine tonsillectomy and adenoidectomy specimens. *Otolaryngol Head Neck Surg.* 2001;125(5):473-477.
2. Alvi A, Vartanian AJ. Microscopic examination of routine tonsillectomy specimens: is it necessary? *Otolaryngol Head Neck Surg.* 1998;119(4):361-363.
3. Dewil B, Jorissen M, Lemkens P. Routine pathological evaluation after tonsillectomy: is it necessary? *B-ENT.* 2006;2(3):103-108.
4. Yasan H, Dogru H, Candir O, Tuj M, Bircan S. Incidence of unexpected pathology in routine adenoidectomy specimens. *Int J Pediatr Otorhinolaryngol.* 2006;70(1):95-98.
5. Ikram M, Khan MA, Ahmed M, Siddiqui T, Mian MY. The histopathology of routine tonsillectomy specimens: results of a study and review of literature. *Ear Nose Throat J.* 2000;79(11):880-882.

6. Erdag TK, Ecevit MC, Guneri EA, Dogan E, İkiz AO, Sutay S. Pathologic evaluation of routine tonsillectomy and adenoidectomy specimens in the pediatric population: is it really necessary? *Int J Pediatr Otorhinolaryngol.* 2005;69(10):1321-1325.
7. Dohar JE, Bonilla JA. Processing of adenoid and tonsil specimens in children: a national survey of standard practices and a five-year review of the experience at the Children's Hospital of Pittsburgh. *Otolaryngol Head Neck Surg.* 1996;115(1):94-97.
8. Younis RT, Hesse SV, Anand VK. Evaluation of the utility and cost-effectiveness of obtaining histopathologic diagnosis on all routine tonsillectomy specimens. *Laryngoscope.* 2001;111(12):2166-2169.
9. Garavello W, Romagnoli M, Sordo L, Spreafico R, Gaini RM. Incidence of unexpected malignancies in routine tonsillectomy specimens in children. *Laryngoscope.* 2004;114(6):1103-1105.
10. Dell'Aringa AR, Juarez AJ, Melo C, Nardi JC, Kobari K, Perches Filho RM. Histological analysis of tonsillectomy and adenoidectomy specimens – January 2001 to May 2003. *Braz J Otorhinolaryngol.* 2005;71(1):18-22.
11. Schrock A, Jakob M, Send T, Heukamp L, Bucheler M, Bootz F. Histology after tonsillectomy [in German]? *HNO.* 2009;57(4):351-357.
12. Beaty MM, Funk GF, Karnell LH, Graham SM, McCulloch TM, Hoffman HT, Robinson RA. Risk factors for malignancy in adult tonsils. *Head Neck.* 1998;20(5):399-403.
13. Sodagar R, Mohallateh EA. Necessity of routine pathological examination of tonsils. *Eye Ear Nose Throat Mon.* 1972;51(6):229-230.
14. Dost P. Histological examination following adenoidectomy and tonsillectomy in children. Surprising results are very rare [in German]. *HNO.* 2006;54(1):16-19.
15. Williams MD, Brown HM. The adequacy of gross pathological examination of routine tonsils and adenoids in patients 21 years old and younger. *Hum Pathol.* 2003;34(10):1053-1057.
16. Wiatrak BJ, Woolley AL. Pharyngitis and adenotonsillar disease. In: Cummings CW, Fredrickson JM, Harker LA, Krause CJ, Schuller DE, Eds. *Pediatric Otolaryngology Head and Neck Surgery.* MosbyYear Book, Missouri; 1998:188-215.
17. Verma SP, Stoddard T, Gonzalez-Gomez I, Koempel JA. Histologic analysis of pediatric tonsil and adenoid specimens: is it really necessary? *Int J Pediatr Otorhinolaryngol.* 2009;73(4):547-550.

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