Tubal Tonsil Hypertrophy

A Cause of Recurrent Symptoms After Adenoidectomy

Kevin S. Emerick, MD; Michael J. Cunningham, MD

Objectives: To assess the incidence of symptomatic tubal tonsil hypertrophy (TTH) after adenoidectomy and to attempt to differentiate the clinicoradiographic presentation of TTH from that of recurrent or residual adenoid.

Design: Retrospective case series review.

Setting: Pediatric otolaryngology practice in a tertiary care hospital.

Patients: The charts of all patients scheduled to undergo revision adenoidectomy or nasopharyngeal examination under anesthesia over a 5-year period in 1 pediatric otolaryngologist’s practice were reviewed.

Main Outcome Measure: Presence of TTH in patients with recurrent symptoms after previous adenoidectomy.

Results: Forty-two patients were identified, 24 of whom satisfied the established criteria of recurrent symptoms after previous adenoidectomy. Ten (42%) of these patients were identified as having TTH. The average age at presentation was 7 years 2 months, at an average time interval of 4 years 2 months after adenoidectomy. The comparative incidence of recurrent or residual adenoid was 54%. The symptomatic manifestations of TTH included nasal obstruction, obstructive sleep disorder, rhinosinusitis, recurrent otitis media, and otitis media with effusion. Preoperative radiographic evaluation was not useful in distinguishing TTH from recurrent or residual adenoid; nasopharyngoscopy appears to have better diagnostic potential. Thermal ablation with suction cautery was therapeutically effective.

Conclusions: Tubal tonsil hypertrophy is a significant clinical entity as a cause of recurrent symptoms after adenoidectomy. The study patients demonstrated the entire spectrum of signs and symptoms seen in patients with adenoid hypertrophy. Operative nasopharyngeal examination is required to definitively distinguish TTH from recurrent or residual adenoid.


TUBAL TONSIL HYPERTROPHY IS ONE OF the most common operations performed on children in the United States. This surgical statistic reflects the importance of the adenoid (pharyngeal tonsil) in the pathogenesis of recurrent otitis media, otitis media with effusion, rhinosinusitis, nasal airway obstruction, and obstructive sleep disorder syndrome.

After successful adenoidectomy, some children again become symptomatic. The presence of residual or recurrent adenoid should be determined in such cases. Allergy or immunodeficiency may also need to be ruled out. An additional potential pathogenesis that warrants consideration is hypertrophy of the remaining lymphoid tissue of Waldeyer’s ring, specifically the tubal tonsils (Figure 1). Removal of the tubal tonsils, also known as the tonsilla tubaria, eustachian tonsils, or Gerlach tonsils, is not consistently performed during adenoidectomy. Their potential impact may not be appreciated until symptoms persist or recur after adenoid removal.

RESULTS

Forty-two patients were identified, 26 of whom had charts that were available for review. Cases involving nasal or nasopharyngeal disease unrelated to our subject of investigation, such as choanal atresia, juvenile angiofibroma, or epistaxis, were excluded. Twenty-four patients satisfied the established criteria of recurrent symptoms after previous adenoidectomy. Table 1 summarizes the final diagnoses in the 24 cases. Ten patients who were identified as having TTH were investigated in greater detail.

Table 2 shows the age at which the 10 patients with TTH underwent their initial adenoidectomy or adenotonsillectomy, the age at the time of subsequent nasopharyngeal examination under anesthesia, and the
time interval between procedures. The mean age at initial presentation was 36.8 months; the mean age at the time of the second procedure was 86.2 months; and the mean interval was 50.2 months.

Table 3 lists the symptoms that prompted the first evaluation and the symptoms that led to the second evaluation. There was considerable variation among the initial presenting symptoms, reflecting the expected spectrum of problems associated with adenoid hypertrophy or inflammation: obstructive sleep disorder, nasal obstruction, rhinosinusitis, recurrent otitis media, and otitis media with effusion. The manifestations at the second presentation were generally recurrences of the initial symptoms. There was not 1 specific symptom or diagnosis found in all cases.

Six of the 10 patients with TTH underwent preoperative flexible fiberoptic examination of the nasopharynx. The findings of 3 examinations suggested TTH, and 3 examinations revealed obstructive lymphoid tissue of unclear etiology. Four patients with TTH underwent lateral plain radiography before “revision adenoidectomy”; all 4 films were interpreted by the radiologist as being consistent with adenoid hypertrophy (Figure 2). One patient underwent computed tomography with identification of a soft tissue nasopharyngeal mass, which was also “suggestive of adenoid enlargement” according to the official radiology report; in retrospect, the bilaterally hypertrophied tubal tonsils can be clearly visualized (Figure 3).

All patients diagnosed as having TTH were treated by means of thermal ablation with suction cautery. Symptomatic relief was achieved in all but 1 patient, who had improvement but not resolution of rhinosinusitis symptoms. Postoperative examination of this patient revealed persistent remnants of tubal tonsil tissue, which were subsequently successfully resected with a microdebrider.

Nine of the 24 patients underwent preoperative evaluations before revision adenoidectomy or nasopharyngeal examination under anesthesia to rule out allergy or immune deficiency. In 1 patient, an immunologic abnormality—IgG2 deficiency—was identified, and 2 patients had documented environmental allergies. None of these patients had TTH.

In the pediatric population, hypertrophy of the pharyngeal lymphoid tissue (adenoid) may cause nasal obstruction and obstructive sleep disorder and contribute to the pathogenesis of rhinosinusitis, recurrent otitis media, and otitis media with effusion. The success of adenoidectomy in treating these conditions is well documented.

Several randomized trials have addressed the contributory role of the adenoid to recurrent or persistent
otitis media, showing a decrease in both the number of acute episodes of suppurative otitis media and overall duration of otitis media and otitis media with effusion after adenoidectomy.\textsuperscript{1,2} These data have led to the current recommended standard of care, which states that the performance of an adenoidectomy be strongly considered in children who are undergoing a second placement of tympanostomy tubes.\textsuperscript{3}

Microbiological data support a similar causative role for the adenoid in rhinosinusitis, with surgical literature demonstrating a significant decrease in the frequency of rhinosinusitis episodes after adenoidectomy.\textsuperscript{4,5} While the timing of adenoidectomy for the management of rhinosinusitis is not as clearly defined as it is for otitis media, the benefit of adenoidectomy, particularly as a prelude to endoscopic sinus surgery in younger children, is well established.

The obstructive potential of the adenoid is readily acknowledged, and the immediate results of improved nasal breathing and relief of obstructive sleep symptoms after adenoidectomy and adenotonsillectomy are well documented.\textsuperscript{6} The hypertrophy of the pharyngeal and palatine tonsils in such cases is of varied pathogenesis.

In the 19th century, the anatomist Wilhelm von Waldeyer described the ring of lymphoid tissue created by the palatine tonsils, pharyngeal tonsil (adenoid), and lingual tonsils. Less prominent but potentially important components of this ring are the lateral pharyngeal wall bands and the tubal tonsils. The tubal tonsils are also known as the tonsilla tubaria, eustachian tonsils, and Gerlach tonsils. They are found beneath the mucosa of the eustachian tube and the torus tubarius and within Rosenmüller fossa.\textsuperscript{7} The tubal tonsils are often not seen as a distinct entity on nasopharyngeal examination until after the adenoid has been removed.

In our series, the incidence of TTH as a cause of recurrent symptoms after prior adenoidectomy or adenotonsillectomy was quite high. In fact, it was almost as common as recurrent or persistent adenoid. To our knowledge, the clinical relevance of the tubal tonsils has been addressed in only 1 prior publication. Honda et al\textsuperscript{8} examined 177 ears 18 to 24 months after adenoidectomy; among 30 ears found to have otitis media with effusion, 50\% demonstrated marked ipsilateral TTH. Carbon dioxide laser ablation of the TTH was used and described as effective, although this result is not quantified with objective data.

Our small series has several interesting findings. With regard to age at recurrent symptomatic presentation, the mean age of the patients with TTH was 7 years 2 months, which

![Figure 2. Plain film radiographs of (A) adenoid hypertrophy and (B) tubal tonsil hypertrophy.](image1)

![Figure 3. Axial computed tomogram of patient with bilateral tubal tonsil hypertrophy (X).](image2)
was older than we initially expected. However, removal of the adenoid may place a greater burden on the remaining lymphoid tissue in the nasopharynx, leading to progressive hypertrophy over a prolonged period of time. The series of patients described by Honda et al\(^8\) were of a similar age range (5-11 years), which is consistent with this hypothesis.

Our clinical impression was that TTH, like adenoid regrowth, would be more likely to occur in children who underwent their initial adenoidectomy at a younger age, perhaps because of smaller nasopharyngeal dimensions. Our findings do not strongly support that impression. The children with recurrent TTH underwent their initial procedure at an average age of 36.8 months, while those with recurrent or residual adenoid underwent theirs at the age of 53.8 months.

The location of the tubal tonsils logically suggests that a potential inflammatory obstruction of the eustachian tube predisposes the patient to recurrent otitis media or otitis media with effusion. Middle ear disease, however, was the recurrent presentation in only 4 of the 10 patients with TTH in our series. Interestingly, all patients in our series presented with partial or complete recurrence of their initial symptoms, demonstrating that tubal tonsils are capable of causing all the classic manifestations of adenoid hypertrophy and adenoiditis, ie, nasal obstruction, obstructive sleep disorder, rhinosinusitis, recurrent otitis media, and otitis media with effusion.

The relative value of preoperative diagnostic studies is noteworthy. Recurrent or residual adenoid hypertrophy was the official radiographic diagnosis in all the lateral plain radiographs that were obtained; as demonstrated in Figure 2, this 2-dimensional study is clearly unable to distinguish TTH. The diagnosis that was made from a single computed tomographic scan performed on a patient in our series was also determined to be adenoid hypertrophy in the official, albeit incorrect, radiographic report (Figure 3). Endoscopic nasopharyngeal fiberoptic examination has diagnostic potential. The presence of lymphoid hypertrophy was recognized in all preoperative fiberoptic examinations, and TTH was suspected in 50%. Honda and colleagues\(^8\) also found fiberoptic examination to be beneficial and, based on their experience, recommended that patients who developed recurrent otitis media with effusion after adenoidectomy undergo nasopharyngoscopy.

In the present series, cautery ablation of the patients with TTH was successful, with only 1 patient requiring revision surgery. None developed complications such as nasopharyngeal or choanal stenosis or eustachian tube scarring with subsequent middle ear disease. Inhalant allergy and quantitative or qualitative immunodeficiency can also contribute to or mimic the symptoms seen in patients with nasopharyngeal lymphoid hypertrophy. Of the 24 patients with TTH or recurrent or persistent adenoid tissue in our series, 1 with IgG2 deficiency was identified and 2 had positive results on allergy testing; however, none of these 3 patients had TTH.

Recurrent or residual adenoid is a clinically recognized potential reason for recurrent symptoms. Surprisingly, the incidence of adenoid regrowth is not well established. A recently published cross-sectional follow-up study of 175 children ranging in age from 2 to 5 years after adenoidectomy found no patients with regrowth, leading to the conclusion that the likelihood of adenoid regrowth may be technique specific. Such may be true of TTH development as well. Because not all patients in our series had their initial adenoidectomy performed by the senior author, the impact of technique on the potential for developing TTH cannot be assessed.

The small size of this case series does not allow for identification of etiologic factors or for definitive conclusions about specific treatment modalities. It does, however, emphasize the potential clinical impact of TTH and the need to be aware of this entity as a cause of recurrent symptoms in children after adenoidectomy or adenotonsillectomy. Because the focus of conventional adenoidectomy is removal of the midline mass of pharyngeal lymphoid tissue, more attention may need to be given to the peritubal region, as stated by others.\(^10\) Preoperative nasopharyngoscopy can suggest the diagnosis of TTH, but only operative nasopharyngeal examination with the patient under anesthesia can provide the definitive diagnosis as well as therapeutic intervention.

Submitted for Publication: June 27, 2005; final revision received August 17, 2005; accepted August 24, 2005.

Correspondence: Michael J. Cunningham, MD, Department of Otolaryngology, Massachusetts Eye and Ear Infirmary, 243 Charles St, Boston, MA 02114 (Michael_cunningham@meei.harvard.edu).

Financial Disclosure: None.

Previous Presentation: This study was presented as a poster at the annual meeting of the American Society of Pediatric Otolaryngology; May 27-30, 2005; Las Vegas, Nev.

### REFERENCES


