

Advances in Tonsillectomy and Adenoidectomy

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Abstract

Introduction: More than 400,000 tonsillectomy and adenoidectomy procedures are performed annually in the United State alone, rendering them among the most commonly performed major operations.

Aim of Work: In this review, we aim to summarize recent evidence pertaining the indications for tonsillectomy and adenoidectomy.

Methodology: We did a systematic search for recent advances in the management of tonsillectomy using PubMed search engine (<http://www.ncbi.nlm.nih.gov/>) and Google Scholar search engine (<https://scholar.google.com>). All relevant studies were retrieved and discussed. We only included full articles.

Conclusions: Tonsillectomy and adenoidectomy are among the most commonly performed major operations. However, increased number of surgical recommendation and unnecessary procedures are usually based on emotion and tradition rather than evidence-based indications. Large pharyngeal lymphoid tissue to cause sleep-related breathing disorder (SRBD) and abnormal polysomnography (PSG) monitoring is considered as an indication for adenotonsillectomy. Data suggest that tonsillectomy could have a marginal benefits in children with a well-documented pattern of severe recurrent tonsillitis and surgery may be not a justified option.

Keywords: Tonsillectomy; Adenoidectomy; ENT; Surgery

Introduction

More than 400,000 tonsillectomy and adenoidectomy procedures are performed annually in the United State alone, rendering them among the most commonly performed major operations [1]. In the setting of proper indications and when performed adequately, life-saving and improved quality of life are of major benefits. However, in spite of the growing part of the literature since the early 1970s that aimed to better definition of candidate populations for tonsillectomy and adenoidectomy, many clinicians still unaware or uncomfortable with their results. This has been resulting in continuity of surgical recommendation and increased number of unnecessary procedures that are usually based on emotion and tradition rather than evidence-based indications. In this review, we aim to summarize recent evidence pertaining the indications for tonsillectomy and adenoidectomy.

Methodology

We did a systematic search for recent advances in the management of tonsillectomy using PubMed search engine (<http://www.ncbi.nlm.nih.gov/>) and Google Scholar search engine (<https://scholar.google.com>). All relevant studies were retrieved and discussed. We only included full articles.

The terms used in the search were: tonsillectomy, adenoidectomy, ENT, surgery.

Indications for adenotonsillectomy

A relative excess of pharyngeal lymphoid tissue is considered as an indication for adenotonsillectomy. Most of the time, the tissue is hypertrophic and occupies a disproportionate space in the upper airway, this is especially encountered in preschool children. Anatomical narrowing of the upper airway (pharynx) in conditions as achondroplasia or craniofacial syndromes exacerbates the problem. Hypertrophic tonsil and adenoid tissue could lead to upper airway obstruction; whereas dynamic elements -as in case of supine patient or patients with diminished neuromuscular tone- increase obstruction symptoms. Studies have incriminated obesity to have a higher risk of obstruction; the proposed mechanism is the inward collapse of bulky soft tissue especially during sleep. Airway obstruction related to adenotonsillar hypertrophy is considered one of the primary cause of sleep-related breathing disorder (SRBD) with upper airway resistance syndrome (UARS) being SRBD mildest form [2]. Sleep-related breathing disorder occurs primarily during rapid-eye-movement (REM) sleep. Patients with UARS complain of snoring, mouth breathing, gasping, enuresis, sleep intermission, and restless sleep. In addition to nocturnal symptoms, the condition manifest in daytime by hypersomnolence, behavioral changes, morning headache, dry mouth, halitosis, audible breathing with open-mouth posture, hypo-nasal speech, and chronic nasal obstruction with or without rhinorrhea. More advanced obstruction may present in patients as obstructive hypopnea syndrome (OHS) or obstructive sleep apnea syndrome (OSAS). The definition of apnea in adults is cessation of airflow at the nostrils and mouth for at least 10 seconds. On the other hand, hypopnea is defined as a decrease in tidal volume of at least 50% accompanied by a drop of at least 4% in the partial pressure of oxygen. To consider OSAS, 5 to 10 episodes of apnea or hypopnea per hour should be detected by polysomnography (PSG). The previous criteria apply on adults and there is no consensus on the criteria to diagnose the syndrome in children. Moreover, children are less likely to be observed by their parents [3]. and in many cases of UARS and OHS, parents may not appreciate the importance of the symptoms. In most severely affected patients, conditions as cor pulmonale, right ventricular hypertrophy, congestive heart failure, alveolar hypoventilation, pulmonary hypertension, pulmonary edema, or failure to thrive may develop. These patients are also at an increased risk of permanent neurologic damage and even death. However, no studies have established a correlation between PSG abnormalities and adverse outcomes in SRBD. In most cases, history and physical examination are not solely enough to determine the candidacy for adenotonsillectomy. In addition, although tonsil and adenoid hypertrophy probably predisposes patients to airway obstruction, it is not feasible to determine airway dynamics during sleep by a static examination in the office. Nevertheless, notwithstanding the usefulness of fiberoptic evaluation of the adenoid as assessing choanal obstruction and providing a detailed wide-angle view, it is not beneficial in showing the dynamics of the nasopharynx during sleep. The radiographic assessment of the adenoid tissue may be subjective and difficult to interpret. All of that lead to consider PSG as the gold standard for objective correlation of ventilatory abnormalities with SRBD [2]. High expense and scheduling difficulties are the major drawbacks and render PSG difficult to routinely use. Other assessment techniques including audiotaping, videotaping, and home PSG, have yielded promising results and require, however, further research. Abbreviated PSG (i.e. overnight oximetry or nap PSG) has been shown to have a high positive predictive value and a low negative predictive value, this means that patients with negative results may require additional diagnostic procedures to adequately exclude the condition [4,5]. Adenotonsillectomy is considered first-line therapy for SRBD in patients with at least moderate adenotonsillar hypertrophy. The operation is usually resulted in both symptomatic and PSG improvements in such patients [6,7]. Obese patients usually require weight loss in addition to surgery.

Dysphagia and speech impairment

Dysphagia (difficult swallowing) may be merely caused by the enlargement of the tonsils or adenoid. In patients with adenoid hypertrophy, dysphagia are more often related to poor coordination of breathing and swallowing. Tonsils large enough to cause obstruction

occasionally interfere with the pharyngeal phase of swallowing so patients have more difficulty in swallowing solids than liquids. In rare cases, severe tonsil hypertrophy leading to velopharyngeal closure may cause dysphagia for liquids that characterized by nasal regurgitation. Similarly, hypo-nasal or muffled speech could result from a large adenoid or obstructive tonsils due to decreases nasal airflow, whereas hyper-nasal speech may result rarely from velopharyngeal insufficiency (VPI) due to tonsil enlargement. Dysphagia associated with failure to thrive and unintelligible speech are indications for adenotonsillectomy. The consequences of creating excessive space in the pharynx with this procedure must be considered in these patients.

Abnormal dentofacial growth

Many studies have suggested the predisposition to dentofacial growth abnormalities in children with chronic nasal obstruction from adenotonsillar hyperplasia. In such children, it is suggested that downward growth of the mandible and repositioning of the tongue may occur as a compensation for the decreased nasal airflow in attempt to create a larger oral airway; this in turn increases the vertical facial dimension and gonial angle. In addition, absence of contact between the tongue and palate causes a high, narrow palatal vault and a secondary posterior dental crossbite. Although a correlation between chronic nasal obstruction and long-face syndrome clearly concluded in many researches, a causal-effect relation has not been established in humans due to outcomes variation in the studies. The variation is suggested to result from inconsistent methods of determining the ratio of nasal to mouth breathing, absence of reference data on nasal volume and resistance, and inadequate length of follow-up. Some data suggest the reversibility of abnormalities in dentofacial growth in patients with adenotonsillar hyperplasia, however, the change may be minimal. Meanwhile, until emerging of strong evidence, otolaryngologists should evaluate children considered for adenotonsillectomy for orthodontic indications on a case-by-case basis and consider the procedure only for those with marked adenotonsillar hyperplasia with obvious effects on dentofacial growth.

Halitosis

Halitosis is defined as a foul odor from the mouth or of the breath. It may occur due to many situations including periodontal disease, debris of the tongue or lingual tonsils, sinonasal infection or foreign body, and gastroesophageal reflux. In the case of hypertrophic tonsils or adenoid, it may occur when food remains and bacteria are retained in the crypts. In spite of many reports suggest adenotonsillectomy to be indicated in case of smelly breath, no strong clinical trials support this action to treat halitosis.

Recurrent tonsillitis

Removal of the tonsils to prevent infection may be considered the most popular indication for decades. Several clinical trials in the early 1900s suggested that tonsillectomy would decrease recurrent upper respiratory tract infections. However, because of unclear or nonrandom patient selection, inadequate and reliance on parents for postoperative data collection, and inappropriate statistical analyses, there was a concern about the validity of their results. To address this, a series of trials was conducted in the 1970s and 1980s to generate more reliable evidence with fewer bias. The first two studies were parallel studies with an identical design except that assignment to surgical or nonsurgical treatment was random in one and according to parental preference in the other [8]. Throat infection was defined by the presence of one of the following criteria: temperature higher than 38.5°C, cervical adenopathy with lymph node larger than 2 cm, presence of tonsillar exudate, or positive culture for group A -hemolytic streptococcus (GABHS). No other attempts were made to determine the cause of infections.

Patients were enrolled only if they had had seven documented episodes of throat infection in 1 year, five per year for 2 years, or three per year for 3 years. Eventually, the randomized trial included 91 patients and the nonrandomized trial had 96 participants. In the randomized trial, episodes of throat infection in the first 3 postoperative years were fewer in patients who underwent tonsillectomy than control patients by 1.85, 1.05 and 0.43 per year respectively. Regarding the results of the nonrandomized trial, tonsillectomy patients had 1.32, 1.32 and 1.58 fewer episodes than control. The differences in the first 2 years were significant. However, in both trials, most patients in the control group had 3 episodes per year, whereas most patients in tonsillectomy group had five to seven. Hence, it is possible to conclude that observed lower frequency of infection in the tonsillectomy group may be attributed to spontaneous improvement in

these patients for a short period rather than actual benefits from the surgery. Nevertheless, total days of sore throat were similar between the surgical and nonsurgical groups with no significant difference. It is worth mentioning that possibility of underestimated effect of tonsillectomy due to shifting of severely affected patients in the nonsurgical group to undergo the procedure. These results indicate that tonsillectomy could have a marginal benefits in children with a well-documented pattern of severe recurrent pharyngotonsillitis. However, the authors suggested that a decision to perform tonsillectomy should consider risks in addition to patients' preferences, anxieties of parents and children, missing school days, accessibility to healthcare, cost, and availability of surgical facilities. Another trial [9] was designed to have three arms in which the enrollment criteria were frequency, severity, and documentation respectively. The control group had less than one episode of moderate to severe pharyngitis per year. The study concluded that surgery was not a justified option in the given circumstances.

Chronic tonsillitis

There is no consensus on the definition of chronic tonsillitis and hence it is poorly defined. The definition as sore throat of at least 3 months duration accompanied by tonsillar inflammation may be appropriate. These cases are unusual and no clinical trials to help guide their medical management have been performed. However, tonsillectomy is considered reasonable in these patients if no response to aggressive antibiotic therapy was achieved.

Peritonsillar abscess

Needle aspiration, incision and drainage could be effective managements in case of one episode of peritonsillar abscess (PTA). Quinsy tonsillectomy is also an effective option. However, tonsillectomy is a better curative option in young individuals or poorly cooperative patients or in case of inadequately drained abscess and may eliminate any chance of recurrence. The efficacy of tonsillectomy in preventing recurrent PTA has not been compared with close monitoring in a prospective methodology, controlled trial. However, many retrospective studies have addressed the. In these studies the estimated recurrence rate for PTA was 10% to 15%. These results suggest that tonsillectomy is not indicated after aspiration or incision and drainage in most cases. A history of two to three episodes of acute tonsillitis in the preceding year of the initial episode of PTA may predict the recurrence. Twenty percent to 30% of patients with PTA have similar history and they should be considered for tonsillectomy after adequate management of abscess [10].

Streptococcal carriage

Even after adequate antimicrobial therapy, Patients with GABHS may still carry the organism asymptotically. Carrier rates were estimated to range from 5% to 40%. However, James et al. estimated that infection spread to other family members in only 9% of the time, and less than half of infected will develop a clinical disease. Thus, only 3.5% of carriers are responsible for spreading clinical disease in their families. Attempts to treat asymptomatic carrier are desirable when the carrier's family has a positive history of rheumatic fever, the carrier has a history of acute glomerulonephritis, the carrier's family is having a "ping-pong" spread of disease, the carrier attends a school experiencing a GABHS epidemic, or the carrier is a food handler or hospital worker. In these cases, administration of additional antimicrobial antibiotics, especially clindamycin and rifampin, has shown some efficacy. Tonsillectomy should be considered in refractory cases.

Hemorrhagic tonsillitis

In most cases, recurrent bleeding from prominent tonsil vessels can be controlled by cauterization. However, patients who have recurrent bleeding or cannot be treated in outpatient setting as in case of uncooperative patient may require tonsillectomy. This is if the bleeding becomes annoying or leads to a marked reduction in hemoglobin or hematocrit level.

Tonsil asymmetry and suspicion of malignant disease.

Lymphoma among other less common pharyngeal cancer may present as asymmetric tonsil hypertrophy. However, most children with apparent tonsil asymmetry have either asymmetric effacement by the tonsillar pillars or benign asymmetry of the tonsils. In one study on children with unilateral tonsil enlargement, all patients with lymphoma had enlargement of the tonsil within 6 weeks before diagnosis,

and most had additional manifestations that distinguished their disease from benign tonsil hyperplasia, such as adenopathy greater than 3 cm, dysphagia, night sweats, and fevers. Syms, *et al.* [11] found only two cases of malignant disease among 49 patients, mostly adults, with tonsil asymmetry, normal mucosa, and no adenopathy. Thus, tonsillectomy for tonsil asymmetry should be considered only in the presence of other symptoms suggesting a malignant process of after proving the diagnosis.

Indications for adenoidectomy

Recurrent or chronic rhinosinusitis or adenoiditis

The relationship between chronic rhinorrhea, chronic adenoiditis, and recurrent rhinosinusitis are poorly understood. In some patients with obstructive adenoid tissue, stasis of secretions in the nasal cavity could be considered a predisposition factor for sinonasal infection. However, in their study, Lee and Rosenfeld demonstrated a correlation between a sinonasal-symptom scores with quantitative bacteriological findings in the adenoid core irrespective to adenoid size. Some data suggest the effectiveness of adenoidectomy in children with persistent and recurrent sinonasal problems. Most clinicians prefer adenoidectomy before consideration of endoscopic sinus surgery. Weinberg *et al.* found that children with recurrent acute symptoms may benefit more from adenoidectomy than those with chronic sinonasal disease.

Otitis media

The proximity of adenoid pad and Eustachian tube opening has encouraged researchers to study the possible benefits of adenoidectomy and adenotonsillectomy in managing otitis media. The effects of the adenoid on the eustachian tube are more likely to be regional inflammation or infection rather than a direct compression. Most clinical trials before 1980 had some methodological flaws and bias. Since 1980, a growing body of the literature has suggested that adenoidectomy [12] and perhaps adenotonsillectomy may play a role in the management of both recurrent acute and chronic otitis media. The suggestion is to consider adenoidectomy with placement of the first set of tubes in children with nasal obstruction, recurrent rhinorrhea, or when a second set of tubes is necessary. In children with cleft palate an inferior strip of adenoid tissue should be preserved to avoid VPI. Adenotonsillectomy has a higher morbidity and less agreed upon. Tonsillectomy is a reasonable additional procedure in patients with airway obstruction or recurrent pharyngitis [12].

Conclusions

Tonsillectomy and adenoidectomy are among the most commonly performed major operations. However, increased number of surgical recommendation and unnecessary procedures are usually based on emotion and tradition rather than evidence-based indications. Large pharyngeal lymphoid tissue to cause sleep-related breathing disorder (SRBD) and abnormal polysomnography (PSG) monitoring is considered as an indication for adenotonsillectomy. Data suggest that tonsillectomy could have a marginal benefits in children with a well-documented pattern of severe recurrent tonsillitis and surgery may be not a justified option. Tonsillectomy is an effective option for peritonsillar abscess if needle aspiration, incision and drainage are not feasible. Regarding adenoidectomy, children with recurrent acute symptoms may benefit more than those with chronic sinonasal disease. Adenotonsillectomy may play a role in the management of both recurrent and chronic otitis media.

Bibliography

1. National Center for Health Statistics, Centers for Disease Control. Advance data 283: ambulatory surgery in the United States, 1994. National Center for Health Statistics (1997).
2. American Academy of Pediatrics, Section on Pediatric Pulmonology, Subcommittee on Obstructive Sleep Apnea Syndrome. "Clinical practice guideline: diagnosis and management of childhood obstructive sleep apnea syndrome". *Pediatrics* 109.4 (2002): 704-712.
3. Goh DY, *et al.* "Sleep architecture and respiratory disturbances in children with obstructive sleep apnea". *American Journal of Respiratory and Critical Care Medicine* 162.2 (2000): 682-686.
4. Brouillette RT, *et al.* "Nocturnal pulse oximetry as an abbreviated testing modality for pediatric obstructive sleep apnea". *Pediatrics* 105.2 (2000): 405-412.

5. Saeed MM., *et al.* "Should children with suspected obstructive sleep apnea syndrome and normal nap sleep studies have overnight sleep studies?" *Chest* 118.2 (2000): 360-365.
6. Nieminen P., *et al.* "Snoring and obstructive sleep apnea in children: a 6-month follow-up study". *Archives of Otolaryngology - Head and Neck Surgery* 126.4 (2000): 481-486.
7. de Serres LM., *et al.* "Measuring quality of life in children with obstructive sleep disorders". *Archives of Otolaryngology - Head and Neck Surgery* 126.12 (2000): 1423-1429.
8. Paradise JL., *et al.* "Efficacy of tonsillectomy for recurrent throat infection in severely affected children: results of parallel randomized and nonrandomized clinical trials". *New England Journal of Medicine* 310.11 (1984): 674-683.
9. Paradise JL., *et al.* "Comparative efficacy of tonsillectomy for recurrent throat infection in more vs. less severely affected children [Abstract]". *Pediatric Research* 31 (1992): 126A.
10. Herzon FS and Harris P. "Peritonsillar abscess: incidence, current management practices, and a proposal for treatment guidelines [Mosher Award thesis]". *Laryngoscope* 105.74 (1995): 1-17.
11. Syms MJ., *et al.* "Incidence of carcinoma in tonsil asymmetry". *Laryngoscope* 110.11 (2000): 1807-1810.
12. Coyte PC., *et al.* "The role of adjuvant adenoidectomy and tonsillectomy in the outcome of the insertion of tympanostomy tubes". *New England Journal of Medicine* 344.16 (2001): 1188-1195.

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