

Indications for Tonsillectomy and Adenoidectomy

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Tonsillectomy and adenoidectomy are separate procedures that should be performed for distinct reasons. Studies now indicate that severe, recurrent pharyngitis responds well to tonsillectomy. According to separate recommendation from the American Medical Association and the American Academy of Pediatrics, patients are candidates for tonsillectomy if they have four or more episodes of pharyngitis a year. Recurrent otitis media and chronic otitis media are improved by adenoidectomy, although placement of pressure-equalizing tubes remains the preferred initial treatment for these conditions. Adenotonsillectomy improves severe upper airway obstruction (cor pulmonale and obstructive sleep apnea), as well as milder forms of airway obstruction (loud snoring). The effectiveness of these procedures in proposed indications, such as sinusitis and adenoiditis, is less well substantiated.

Tonsillectomy and adenoidectomy are performed less often not than in the past, in part because of the availability of effective antibiotic therapy and also because of skepticism about their efficacy. The effectiveness of tonsillectomy and adenoidectomy was not clearly demonstrated until the past decade, when these procedures were shown to be beneficial in the treatment of airway, tonsil and middle ear disease. Tonsillectomy and adenoidectomy should be regarded as separate operations with different indications (Table 1).

Indications for Tonsillectomy

Pharyngitis

Recurrent pharyngitis is the most frequent indication for tonsillectomy. The goals of surgery include amelioration of symptoms, avoidance of sick days and reduction of complications such as peritonsillar abscess, streptococcal cervical adenitis and the immunologic sequelae of streptococcal infections.

The etiology of sore throat may be viral or bacterial. Adenovirus and Epstein-Barr virus produce an exudative pharyngitis that is clinically indistinguishable from streptococcal infection. Bacteria other than group A streptococci can also cause pharyngitis and may occasionally account for failure of penicillin therapy. All patients with chronic or recurrent pharyngitis should receive a trial of a beta-lactamase-resistant antibiotic before tonsillectomy is considered.

Studies of tonsillectomy for recurrent pharyngitis are limited. Therefore, recommendation regarding the proper frequency and severity of infection prior to a decision for surgery remain arbitrary. Several studies conducted in the 1960s and 1970s recently have been criticized as being flawed in design.

The best support for the use of tonsillectomy in recurrent pharyngitis comes from a trial conducted in the early 1980s by Paradise and colleagues at the Children's Hospital in Pittsburgh. Patients with a history of severe recurrent pharyngitis were enrolled in the trial. Only 9 percent of the patients referred to the trial met the necessary criteria for tonsillectomy. These criteria included physician documentation of seven cases of pharyngitis in one year, five cases per year for two years or three cases per year for three years. Additional criteria included at least one of the following: (1) a temperature of 101°F (38.3°C), (2) 2-cm, tender cervical adenopathy, (3) tonsillar exudate or (4) a throat culture that was positive for group A streptococci.

Table 1. Tonsillectomy, Adenoidectomy and Adenotonsillectomy: Advantages and Disadvantages

Procedure

Advantages

Disadvantages

Comments

Tonsillectomy for pharyngitis

Amelioration of symptoms

Reduced incidence of sore throat, streptococcal infection and sick days

Surgical risk

Pain

Psychological trauma

Cost

Antibiotic trial first

Adenoidectomy for otitis media

Avoidance of daily antibiotic therapy

Longer-lasting results than achieved with pressure-equalizing tubes

Reduced incidence of chronic otitis media with effusion

Surgical risk

More costly than antibiotic therapy or tube placement

Less effective (short-term) than pressure-equalizing tubes

More painful than tube placement

More effective for otitis media with effusion than for recurrent otitis media

Adenotonsillectomy for obstruction

Improvement in cor pulmonale, obstructive sleep apnea and snoring

Surgical risk

Antibiotic trial first in some adults.

Ninety-one of those patients who met the necessary criteria for surgery were assigned to one of three treatment groups: tonsillectomy, adenotonsillectomy or no surgery (control group). The patients in all three groups were then followed for at least two years. Eighteen percent of

those who underwent tonsillectomy or adenotonsillectomy had two or more streptococcal throat infections in the next two years, compared with 54 percent of the control subjects. At two-year follow-up, a similar decrease in the incidence of the other criteria was seen for the surgical groups as compared with the control group. The percentage of patients who had three or more sore throats meeting one of the criteria (eg, fever, adenopathy, exudate) was 29 percent after surgery, compared with 79 percent for patients in the control group. The percentage of patients having three or more sore throats of any type was 32 percent for those who were treated surgically, compared with 86 percent for those in the control group.

Paradise and colleagues found that patients who had been treated surgically had fewer, milder repeat episodes of pharyngitis. It has not been shown that tonsillectomy decreases the incidence of rheumatic fever, but lowering the incidence of streptococcal throat infections should certainly help. Paradise and co-workers declined to extrapolate their results to more moderate cases of pharyngitis, but they agree with other investigators that such factors as family, school and work disruption, tolerance of illness and compliance with antibiotic therapy should be taken into consideration prior to a decision to operate.

Gates and Folbre believe that sore throat is clinically significant when it is associated with pain, fever and at least one of the following: (1) tonsillar redness or exudate, (2) enlarged or tender cervical lymph nodes or (3) a throat culture that is positive for group A streptococci. According to guidelines shared by the American Medical Association and the American Academy of Pediatrics, tonsillectomy may be indicated for patients who have four or more documented cases of pharyngitis over one year. These guidelines, which are accepted by many authorities, provide a reasonable approach pending further study.

Peritonsillar Abscess

Peritonsillar abscess is a unilateral collection of pus between the tonsillar capsule and bed. It is caused by both aerobic and anaerobic organisms. Peritonsillar abscess almost always follows an episode of chronic or recurrent pharyngitis that was incompletely treated. Previously recommended treatment involved incision and drainage, hospital observation and tonsillectomy four to 12 weeks later; however, this approach has recently been challenged.

Since the recurrence rate for peritonsillar abscess is low in patients over 40 years of age, tonsillectomy is not indicated in this age group unless there is a history of previous abscess or severe, recurrent pharyngitis. Because 70 to 90 percent of peritonsillar abscesses occur at the more accessible superior tonsillar pole, management consisting of needle aspiration, antibiotics and follow-up has recently become popular in the treatment of these abscesses.

Since the recurrence rate for peritonsillar abscess is higher in children (7 percent) and general anesthesia is often required to gain proper exposure and drainage in patients less than 15 years of age, a "hot" or "quinsy" tonsillectomy is usually preferred in young patients. Either aspiration or acute tonsillectomy is acceptable treatment for peritonsillar abscess in patients 15 to 40 years of age.

Relative Indications

Tonsillectomy has occasionally been performed for the treatment of recalcitrant halitosis due to recurrent trapping of food in deep tonsillar crypts. Group A streptococcal or diphtheria carrier states and tuberculous adenitis may be considered indications for tonsillectomy. Surgery also may be performed for less frequent episodes of recurrent pharyngitis in the presence of valvular heart disease, a ventriculoperitoneal shunt, poorly controlled diabetes or a history of febrile seizures. Suspicion of malignancy (eg, squamous cell carcinoma in adults, lymphoma in children) demands removal of the tonsils for histologic examination. No specific studies support these indications, and the choice of surgery depends on clinical judgment.

Indications for Adenoidectomy

Otitis Media

Adenoidectomy is indicated for recurrent otitis media and chronic otitis media with effusion. Of these two conditions, chronic otitis media with effusion (defined as persistence of effusion for at least three months) appears to respond better to adenoidectomy.

Until the past decade, adequate studies of the efficacy of adenoidectomy were lacking. In 1983 Maw reported the results of his study of two- through 11-year-old children with a history of chronic otitis media with effusion lasting more than 12 weeks. He noted significant improvement in those children who were treated surgically. Rates of resolution of effusion for the adenoidectomy, adenotonsillectomy and nonsurgical (control) groups were 72 percent, 62 percent and 26 percent, respectively.

Maw and Herod reported improvements in hearing threshold among those children who were treated surgically for chronic otitis media with effusion. The children who underwent adenoidectomy had a hearing threshold improvement of 13.5 dB; those who underwent adenotonsillectomy had a hearing threshold improvement of 11.6 dB, while those in the control group had a hearing threshold improvement of 5.0 dB.

In a later study, Maw and Parker reproduced these results for effusion and hearing improvement. They noted that while adenoidectomy is effective in chronic otitis media with effusion, the addition of tonsillectomy provides no benefit.

Some investigators believe there has been no definitive proof that longstanding bilateral effusion and the resultant conductive hearing loss have lasting effects on language or development. Therefore, the clinical significance of such hearing threshold reductions, except as a marker of effusion and hearing improvement, is uncertain.

Gates and associates have performed the largest study documenting the efficacy of adenoidectomy in children with middle ear effusion lasting more than 60 days. Results following adenoidectomy were generally better (although not always significantly so) than those following

placement of pressure-equalizing tubes. Patients were randomly assigned to a control group or to a group receiving pressure-equalizing tubes, adenoidectomy, or both.

Percentages of time patients had an effusion over the two years of follow-up were 49.1 percent for the control group, 34.9 percent for the patients who received pressure-equalizing tubes, 30.2 percent for those who underwent adenoidectomy and 2.58 percent for those who received pressure-equalizing tubes and underwent adenoidectomy. The hearing threshold was 20 dB or more bilaterally in 18.6 percent of the control subjects, 10.1 percent of the children who received pressure-equalizing tubes, 7.8 percent of those who underwent adenoidectomy and 6.5 percent of the patients who received both adenoidectomy and pressure-equalizing tubes.

Gates and associates reported a less dramatic reduction in the incidence of recurrent otitis media. Over the two years of follow-up, treatment for at least one acute episode of recurrent otitis media was necessary in 56 percent of the children in the control group, 48 percent of those who received pressure-equalizing tubes, 38 percent of those who underwent adenoidectomy and 55 percent of those who received both pressure-equalizing tubes and adenoidectomy. Tubes appeared to be superior on short-term follow-up, as long as they were in place and functioning, but they were less effective over the full two-year postoperative period due to loss of benefit following extrusion.

Paradise and colleagues studied recurrent otitis media in patients with a history of more severe disease than is usually encountered. All of their patients had previously had tube placement with subsequent extrusion and the occurrence of otitis media. Over the 24 months of follow-up, the group that underwent adenoidectomy spent less time with effusion than the control group (15.0 percent the first year and 17.8 percent the second year for those patients who had adenoidectomy, compared with 28.5 percent the first year and 28.4 percent the second year for the control subjects). The adenoidectomy group had 28 percent fewer episodes of otitis media (an average of 1.06 episodes for patients treated with adenoidectomy versus 1.45 episodes for control subjects) and 35 percent fewer episodes the second year (an average of 1.09 episodes for patients treated with adenoidectomy versus 1.67 episodes for control subjects).

Whether the first surgical intervention for the treatment of chronic otitis media with effusion should be tube placement or adenoidectomy is a subject for debate. Both procedures should be preceded by a trial of an antibiotic such as amoxicillin. If this trial fails, a beta-lactamase-resistant agent should be given. Gates and associates advocate adenoidectomy as initial treatment, because of its greater benefit in chronic otitis media with effusion. Although adenoidectomy is more expensive than tube placement, it becomes cost-effective when the expense of retreatment following tube extrusion is considered. In contrast, Paradise and co-workers believe that the marginal benefit of adenoidectomy over tympanotomy tubes fails to justify the greater cost and greater surgical complexity of adenoidectomy. Therefore, they recommend tube placement as the first treatment for chronic otitis media with effusion.

Paradise and associates have been the only researchers to specifically evaluate adenoidectomy in the treatment of recurrent otitis media. Although they demonstrated that

recurrent otitis media responded to adenoidectomy, both they and the Gates group found that chronic otitis media with effusion is more responsive to the procedure. Paradise and co-workers recommend adenoidectomy for recurrent otitis media only for children who meet the stringent criteria used for entry into their study, including previous tube extension. They recommend that tube placement be performed first if surgery is to be done later.

Intervention for recurrent otitis is generally recommended following three or more episodes in six months or four or more episodes in one year. Most investigators advocate the use of suppressive antimicrobial prophylaxis prior to surgery. The present recommendation for both recurrent otitis media and chronic otitis media with effusion favors initial tube placement in the absence of nasopharyngeal obstruction and subsequent use of adenoidectomy at such time as continued ear disease necessitates placing a second set of tubes.

Other Indications

The symptoms of adenoiditis, including purulent rhinorrhea, nasal obstruction and fever, may be confused with those of rhinitis or sinusitis. Some clinicians favor treatment of this uncommon condition with adenoidectomy, but no specific criteria have been established. Sinusitis has reportedly been caused by adenoid enlargement and choanal obstruction, which may resolve following removal of adenoids. Again, definitive criteria are lacking.

Indications for Adenotonsillectomy

Both tonsillar and adenoidal enlargement can obstruct food or air passage. Enlargement may produce a continuum of symptoms, ranging from snoring to cor pulmonale. Adenoidal hypertrophy is associated with the triad of snoring, mouth breathing and hyponasal speech.

Nasopharyngeal airway obstruction and resultant mouth breathing are thought to eventually cause facial skeletal changes, producing an "adenoid facies" characterized by a greater anterior facial height, a high palate, a narrow maxillary arch and, frequently, a crossbite. Adenoidectomy is reported to result in a more normal facial form, but this effect remains debatable.

Excessive tonsillar bulk can induce dysphagia, snoring and obstructive sleep apnea. Patients with obstructive sleep apnea usually have heavy snoring with apneic episodes and restless sleep; they may also experience enuresis, daytime hypersomnolence, and intellectual and/or behavioral problems. Fulminant cor pulmonale eventually may result.

Virtually all experts consider cor pulmonale to be a definite indication for surgery. Less severe cases of tonsillar and adenoidal enlargement characterized by obstructive sleep apnea, marked obstruction but no obstructive sleep apnea, and even loud snoring are reasonable indications for tonsillectomy and adenoidectomy. A trial of antibiotic therapy should be given first in an attempt to shrink pharyngeal lymphoid tissue. Most sources describe the performance of combined tonsillectomy and adenoidectomy for such obstructive symptoms.

Adenotonsillectomy is usually performed initially in children, reserving uvulopalatopharyngoplasty (UPPP) for recurrent obstructive problems occurring after adenotonsillectomy. UPPP and tonsillectomy without adenoidectomy are often effective for obstructive problems and snoring in adults.

Complications

Adenotonsillar surgery is relatively safe, but the risks should be assessed before surgery is performed. Paradise and colleagues found that 6.3 percent of children undergoing tonsillectomy or adenotonsillectomy require at least one more day of hospitalization than planned. Postoperative bleeding requiring surgical intervention occurs in 1 to 5 percent of patients, and transfusion is required in 0.4 percent of patients. Reported overall mortality rates range from one death per 14,000 procedures to one death per 35,000 procedures, including anesthesia risk.

Rarely, circumferential scarring following adenotonsillectomy results in nasopharyngeal stenosis, which is difficult to correct. Many authorities believe that submucous cleft palate, neuromuscular disorders, and certain conditions affecting craniofacial structure and function (eg, Down's syndrome, Pierre Robin syndrome) are contraindications to tonsillectomy and adenoidectomy because of the increased risk of resultant hypernasal speech. There is no evidence of increased risk of infection or neoplasm following surgery, since the amount of lymphoid tissue removed is small in comparison with the total amount remaining in the aerodigestive tract.

Final Comment

Although surgery on Waldeyer's tonsillar ring has been performed for over a century, its efficacy has only been documented in the last decade. Tonsillectomy is effective in patients with severe, recurrent pharyngitis. Adenoidectomy ameliorates chronic otitis media with effusion and decreases the number of episodes of recurrent otitis media, although it appears to be more effective for the former than the latter. Placement of pressure-equalizing tubes remains the favored initial surgical procedure for patients with middle ear disease. Oropharyngeal and nasopharyngeal obstruction, especially when marked, are also indications for tonsillectomy and adenoidectomy.

Physician judgment and individualization of treatment are necessary in less severe cases of these conditions, as well as in several of the conditions in which tonsillectomy and adenoidectomy may be beneficial. The physician should emphasize to patients and parents that tonsillectomy and/or adenoidectomy may not prevent further problems, but that the procedures should reduce the frequency and severity of these problems.