



Tonsils: Take'Em or Leave'Em

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For those who grew up during or before the 1960's, tonsillectomy was a rite of passage in childhood. Millions of children underwent tonsillectomy/adenoidectomy surgery, and in the first half of the 1900's, it was the most frequently performed surgical procedure in the United States. With improved antibiotic availability, and lowered risk of post-streptococcal complications, the incidence of tonsillectomy dropped by over 50% in the 1970's and '80's. However, with the decline in tonsillectomy surgery for throat infections came an increased awareness of adenotonsillar enlargement contributing to sleep disorders in children. Over the past 35 years, the majority of children undergoing tonsillectomy/adenoidectomy are doing so due to sleep disordered breathing (SDB). Approximately 500,000 tonsillectomies are performed annually in the US, and it is the second most common ambulatory surgical procedure performed on children, after tympanostomy tube placement.

In 2011, the American Academy of Otolaryngology-Head and Neck Surgery published updated clinical practice guidelines for tonsillectomy in children. (Baugh) The two primary indications to consider surgery are recurrent throat infections and sleep disordered breathing. With regard to recurrent throat infections, the recommendations are as follows:

1. Watchful waiting for recurrent throat infection if there have been fewer than 7 episodes in the past year or fewer than 5 episodes per year in the past 2 years or fewer than 3 episodes per year in the past 3 years. A throat infection includes a sore throat with one or more of the following: temperature >38.3C, cervical adenopathy, tonsillar exudate, OR positive test for group A beta-hemolytic streptococcus.
2. Modifying factors to the above would include children with severe multi-antibiotic intolerance or allergy, periodic fever, aphthous stomatitis, pharyngitis, adenitis (PFAPA), or history of peritonsillar abscess.

With increased recognition and understanding of implications of SDB, there has been a steady increase in SDB as a primary indicator for tonsillectomy/adenoidectomy in children. SDB is defined as abnormalities in respiratory patterns, or inadequate ventilation during sleep, which include snoring, mouth breathing, and apneic pauses. SDB is a spectrum of disorders, ranging from primary snoring to obstructive sleep apnea. Nighttime symptoms may include restless sleep, frequent waking, enuresis in children over age 6 years, and post-tussive emesis. Daytime sequelae of SDB are now known to impact quality of life, leading to decline in daytime behavior, inattention, poor concentration, poor school performance, and hyperactivity. Less readily recognized sequelae of adenotonsillar enlargement and chronic mouth breathing include dental and orthodontic abnormalities, including dental caries, gingival inflammation, anterior open-bite deformity, and class III malocclusion. Several studies have documented improved SDB-related parameters following adenotonsillectomy in daytime behavior and quality of life. (Mitchell). (Goldstein)

Evaluation for a candidate considering adenotonsillectomy includes careful history regarding prior sore throats. In children with history of recurrent throat infections, physical examination often reveals small, cryptic tonsils. The majority of these children do not suffer from SDB. In children with SDB, careful history regarding snoring, sleep patterns, and daytime symptoms, along with physical evidence of tonsillar enlargement are important in surgical evaluation. While polysomnography (sleep study) remains the 'gold standard' in evaluation of SDB, history and physical examination offer important insights, and adenotonsillar surgery is often indicated, even in absence of polysomnogram. (Rosen)

Despite the high incidence of adenotonsillar surgery, there are potential risks that need to be taken into consideration with each patient. A common complication of surgery is postoperative bleeding, with primary bleeding (in the first 24 hours following surgery) being in the 0.2%-2% range, and secondary bleeding (more than 24 hours following surgery) in the 0.1%-3% range. Post-operative bleeding may require hospital readmission and surgical intervention to control the bleeding. Other postoperative complications include nausea, vomiting, dehydration, fever, pain, and post-obstructive pulmonary edema.

Mortality following adenotonsillectomy is low but not to be ignored. Rates range from 1 in 16,000 to 1 in 35,000 cases. Approximately 30% of deaths are due to bleeding, and the remainder are secondary to aspiration, cardiopulmonary failure, airway compromise, or anesthetic complications. Post-tonsillectomy mortality has come to the attention of both physicians and the lay public in the recent years. Between 2009 and 2012, several pediatric deaths due to respiratory compromise following adenotonsillar surgery were reported after standard use of the analgesic codeine. This drug is a 'pro-drug', as its active metabolite, morphine, leads to analgesic effect. It is thought that some patients are 'rapid metabolizers', and convert standard dose codeine to doses of morphine magnitudes higher than others. In the setting of post-operative obstruction, this has led to several deaths

in the early post-operative period. In 2013, the FDA issued a 'Black Box' warning against the use of codeine following adenotonsillar surgery in children.

A second devastating outcome reached the lay press in the past two years. In 2013, then 13-year-old Jahi McMath underwent adenotonsillectomy (as well as palate surgery and turbinate surgery), in efforts to relieve her symptoms of OSA. She sustained a massive primary postoperative hemorrhage, and, despite resuscitation, was declared brain dead. The details and outcome of this case have yet to be disclosed, as she remains on life support in the northeast. Had the ethical issues of withdrawing versus maintaining life support not come to such battle in a previously healthy child declared brain dead, few outside of the Oakland area would have become so familiar with this child and her family. As devastating as this has been, unfortunately she is not the first child to succumb post-adenotonsillectomy. Needless to say, those of us who perform this surgery on a regular basis were especially touched by this tragic event. We all recognize the risks of this operation, and take extra care to minimize all peri-operative complications. As I do not know the medical and surgical details of this particular case, I refrain from speculating on 'what really happened'. This question continues to be brought to me by patient families. If nothing else, it reminds us as physicians that there is no such thing as 'just' anything. I always tell my residents that there is no such thing as 'just a tonsillectomy', 'just an ear tube', or 'just another clinic day'. While promising outcomes data are always a good sign, an 'n' of 'one' is sometimes all one needs to tip the numbers.

References:

Baugh RF, Archer SM, Mitchell RB. Clinical Practice Guideline: Tonsillectomy in Children. *Otolaryngol Head Neck Surg* 2011;144(S1):S1-S30.

Mitchell RB, Kelly J. Behavior, neurocognition, and quality-of-life in children with sleep-disordered breathing. *Int J Pediatr Otorhinolaryngol* 2006; 70:395-406.

Goldstein NA, Post JC, Rosenfeld RM, et al. Impact of tonsillectomy and adenoidectomy on child behavior. *Arch Otolaryngol Head Neck Surg* 2000;126: 494-498.

Rosen CL, Wang R, Talyor G, et al. Utility of symptoms to predict treatment outcomes in obstructive sleep apnea syndrome. *Pediatrics* 2015; 135(5):e662-e671.

<http://www.fda.gov/Drugs/DrugSafety/ucm313631.htm>

https://en.wikipedia.org/wiki/Jahi_McMath_case