



# Don't overlook the complications of tonsillectomy

These pre- and postop steps can help you make an already safe procedure even safer.

## PRACTICE RECOMMENDATIONS

□ Monitor patients for pain, nausea and vomiting, and bleeding, as they are the most common complications of tonsillectomy. **A**

□ Effectively manage post-operative pain to prevent dehydration, which can occur when patients fail to take in enough fluids because swallowing is painful. **B**

### Strength of recommendation (SOR)

- A** Good-quality patient-oriented evidence
- B** Inconsistent or limited-quality patient-oriented evidence
- C** Consensus, usual practice, opinion, disease-oriented evidence, case series

**A**lthough the number of patients undergoing tonsillectomy has gradually declined since the 1970s, it remains one of the most common surgical procedures performed worldwide.<sup>1</sup> The procedure, of course, is fairly routine—but not without risk.

Mortality rates for the operation range from 1 in 10,000 to 1 in 35,000, with morbidity rates ranging from 1.5% to 14%; mortality and morbidity after tonsillectomy are usually the result of postoperative bleeding.<sup>2,3</sup> In addition to bleeding, other common complications include pain, nausea, and vomiting.

The patient's surgeon plays a central role in minimizing risk. But as a primary care physician, you, too, play an important role in ensuring that your patient's tonsillectomy is eventful. This review will help toward that end.

## Refine your preop approach

**■ Address informed consent issues.** While the surgeon is responsible for obtaining informed consent, a patient may discuss the procedure with you, the family physician. (See **TABLE 1** for the indications for tonsillectomy.) Although the procedure is safe and effective, the patient and his or her family need to know that bleeding will most likely occur immediately after the procedure, although it can occur at any time during the first 2 weeks postop. Advise the patient and family that postop pain is similar to that of a throat infection, but is often felt in the ears ("referred otalgia"). Because postop swallowing is painful, the patient may not drink enough fluids. If this problem because severe, he or she may need to be admitted for IV fluid replacement.

**■ Discuss the patient's length of stay.** An increasing number of tonsillectomies are performed on an outpatient basis. However, high-risk patients—those with sleep apnea, coagulation disorders, or other underlying diseases, and anyone younger than 4 years of age or living a long distance from the hospital—should be admitted for overnight observation.<sup>4</sup>

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TABLE 1

## Indications for tonsillectomy

Tonsils are infected $\geq 3$ times a year despite adequate medical therapy
Peritonsillar abscess is unresponsive to medical management and drainage documented by surgeon, unless surgery is performed during acute stage
Chronic or recurrent tonsillitis associated with the streptococcal carrier state and not responding to beta-lactam antibiotics given with a beta-lactamase inhibitor
Hypertrophy causing dental malocclusion or adversely affecting orofacial growth that has been documented by orthodontist
Hypertrophy causing upper airway obstruction, severe dysphagia, sleep disorders, or cardiopulmonary complications
Persistent foul breath or bad taste in mouth due to chronic tonsillitis that has not been responsive to medical therapy
Unilateral tonsil hypertrophy that is presumed to be neoplastic

Source: Erickson BK, Larson DR, St Sauver JL, et al. Changes in incidence and indications of tonsillectomy and adenotonsillectomy, 1970-2005. *Otolaryngol Head Neck Surg.* 2009;140:894-901.



Because postop swallowing is painful, the patient may not drink enough fluids. If the problem is severe, the patient may need IV fluid replacement.

**Ask about previous surgeries.** Tonsillectomies are performed under general anesthesia in most facilities. Ask about previous surgeries and conditions that may adversely affect the surgery: Does the patient have any upper airway obstruction, difficulty extending his cervical spine, or enzymatic deficiencies? A pseudocholinesterase deficiency, for instance, may cause prolonged paralysis of the respiratory muscles, requiring an extended period of time during which the patient must be mechanically ventilated.

Anesthesiologists use the Mallampati score to predict the ease of intubation.<sup>5</sup> It's derived by visualizing the base of the uvula, the tonsillar pillars, and the soft palate. Scoring may be done with or without phonation. A patient is considered to be in 1 of 4 classes, depending upon what can be visualized:

**Class 1:** the tonsils, uvula, and soft palate

**Class 2:** the hard and soft palate and upper portion of the tonsils and uvula

**Class 3:** the soft and hard palate and base of the uvula

**Class 4:** the hard palate.

As a general rule, patients scheduled for tonsillectomy are prone to higher scores because of underlying disease.

**Order lab tests, stop certain medications.** Instruct patients to discontinue aspirin 7 days before surgery, and naproxen and

other nonsteroidal anti-inflammatory drugs (NSAIDs) 4 days before surgery.<sup>6</sup> Antiplatelet aggregation drugs such as clopidogrel should also be stopped 7 days before surgery.<sup>6</sup>

While you should routinely order a complete blood count, experts disagree on the value and cost-effectiveness of routinely running prothrombin time and partial thromboplastin time.<sup>7</sup>

**Assess whether the patient is anxious about the surgery.** Tonsillectomy and the subsequent hospitalization can make patients anxious, bringing on sleep disturbances, behavioral problems, nightmares, enuresis, and emotional regression. Fortunately, these problems usually disappear without any intervention, but offering patients preop reassurance, demonstrations, and educational materials may help prevent them (TABLE 2).

### Address postop complications

**Ensure that your patient has proper pain relief.** Sore throat and referred otalgia are common, but usually subside within 2 weeks. The pain typically manifests as dysphagia, which results from trauma to the pharyngeal muscles. Keep in mind that pain is not always a minor complication; if prolonged, it may be accompanied by dehydra-

**TABLE 2**  
**Patient education resources**

<http://www.tonsil.org/HBW/About.htm>  
<http://www.entnet.org/HealthInformation/tonsillectomyProcedures.cfm>  
[http://kidshealth.org/kid/ill\\_injure/sick/tonsils\\_out.html](http://kidshealth.org/kid/ill_injure/sick/tonsils_out.html)  
<http://www.youtube.com/watch?v=LP7Os8m0Nc4>

tion, fever, and even bleeding. Be sure to rule out otitis media in any patient complaining of otalgia who has had both tonsillectomy and adenoidectomy.

Nearly 50% of children who have had a tonsillectomy experience severe pain, defined as a visual analog score of 8 or more.<sup>8</sup> According to 1 large-scale study, all children will experience moderate or severe pain while at rest and when swallowing during the first 48 hours after surgery—despite an appropriate around-the-clock dose of acetaminophen with codeine.<sup>9</sup>

Although high-dose acetaminophen, with or without codeine, is the most common analgesic prescribed for children after ambulatory surgery, its analgesic effect varies widely, so it may need to be administered in conjunction with other agents.<sup>10</sup>

One meta-analysis of several prospective, randomized, double-blind trials concluded that the risk of posttonsillectomy bleeding was nearly 4 times greater when patients received nonselective NSAIDs. This prompted the recommendation that these agents be avoided.<sup>11</sup> However, a more recent analysis that included selective cyclooxygenase-1 (COX-1) and COX-2 inhibitors found that these NSAIDs did not significantly alter perioperative bleeding.<sup>12</sup> With that in mind, selective COX-2 inhibitors such as celecoxib may safely relieve posttonsillectomy pain.<sup>13</sup>

Because so many patients develop postop nausea and vomiting, many surgeons avoid postop opioids such as codeine or tramadol, which can aggravate nausea without significant analgesic benefit. These agents are usually prescribed only after the gastrointestinal adverse effects have subsided, or when combined with antiemetics.

**Ensure that nausea and vomiting have been properly addressed.** Up to 89% of children undergoing tonsillectomy have postop vomiting and nausea.<sup>14</sup> During the surgery, intravenous dexamethasone is usually administered because of its antiemetic effect—which can last up to 48 hours—and because of its role in preventing postop oropharyngeal edema.<sup>14</sup>

**Watch for postop bleeding.** Bleeding, followed by hypovolemic shock, is the most common cause of morbidity and mortality among patients undergoing tonsillectomy, affecting an estimated 0.5% to 10%. Approximately 1 in 200 patients returns to the operating room (OR) so that the bleeding can be controlled. Mortality from bleeding is 2 in 10,000 tonsillectomies. Most cases of fatal postop bleeding occur within the first 24 hours after surgery.<sup>15-17</sup>

Although clinicians should attempt to estimate blood loss during active bleeding, the estimate may be too low in children because they tend to swallow blood. Despite this caveat, consider blood transfusion when the estimated blood loss is 10% or more of the blood volume in infants, 25% in children, and 20% in adults.<sup>18</sup>

If transfusion is warranted, 2 large intravenous lines will need to be inserted, blood samples will need to be sent for typing and cross-matching, and a complete blood count and coagulation studies will need to be ordered. The patient's airway will need to be protected and hemodynamic monitoring maintained.

If the bleeding is not excessive, applying local pressure with gauze on the tonsillar bed may be effective, assuming the patient is cooperative. However, if this doesn't work, the patient will need to be rushed to an OR to control the bleeding. Anesthetizing a patient with massive oral bleeding is among the most challenging emergencies. Always anticipate aspiration once the bleeding has been controlled.

### **Be ready for these complications, too**

The following complications are occasionally encountered after tonsillectomy, but no large controlled studies have estimated their frequency.

**Patients should discontinue aspirin 7 days before surgery, and naproxen and other NSAIDs 4 days before surgery.**

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### **Airway obstruction**

Mucosal damage during intubation may cause air to enter parapharyngeal tissues, which in turn can result in laryngeal spasm and cervical emphysema after extubation. It can progress to pneumomediastinum and tension pneumothorax.<sup>19,20</sup> Excessive pressure on the surgical blades and manipulation within the oral cavity during surgery can cause lingual and oropharyngeal edema.<sup>21</sup> With these potential complications in mind, the primary care physician will need to monitor the patient postoperatively for dyspnea.

Acute airway obstruction can occur if blood or clots accumulate in the hypopharynx as the patient is awakening, immediately after extubation, or later. The most important way to prevent this complication is to ensure that there are no active bleeding sites. The airway can also be compromised from residual bleeding and an evolving airway edema.

On rare occasions, a patient's airway can become obstructed if dislodged tonsillar tissue is not fully removed during surgery, or if loose teeth and parts of surgical instrumentation find their way into the airway. Being cognizant of these possibilities will help you, the primary care physician, to make an accurate differential diagnosis postoperatively.

Children suffering from obstructive sleep apnea due to craniofacial abnormalities, hypotonia, obesity, or "kissing" tonsils are at increased risk of developing acute airway maintenance difficulties after tonsillectomy. Prolonged obstruction of the upper airway from the obstructing tonsils can increase intrathoracic pressure and decrease venous return and pulmonary blood volume. After removal of the tonsils, there is a sudden increase in venous return, pulmonary blood volume, and pulmonary hydrostatic pressure. These rapid changes cause a fluid shift from pulmonary vessels into the lungs' interstitial spaces and alveoli. The complication is sometimes referred to as "negative-pressure pulmonary edema."<sup>22,23</sup>

Appropriate management includes close monitoring and the use of continuous positive airway pressure ventilation, as needed. The same approach is appropriate in children with right-sided cardiac insufficiency or pulmonary hypertension.

### **Fever and infection**

Fever may occur within 18 to 36 hours after tonsillectomy as a result of lung atelectasis, a response to anesthetic agents, or a transient bacteremia. A postop fever lasting more than 24 hours, accompanied by severe throat pain, suggests an emerging pharyngeal infection.

Some surgeons prescribe prophylactic postop antibiotics to reduce the risk of infection in the traumatized region, decrease pain, and enable the patient to return quickly to a normal oral diet.<sup>24</sup> A meta-analysis suggests, however, that postop oral antibiotics don't reduce infection rates, posttonsillectomy pain, or secondary hemorrhage rates; the drugs do facilitate a return to normal activity and diet about a day sooner.<sup>25,26</sup>

Pneumonia used to be a common complication due to aspirated blood during the procedure. With the advent of improved surgical and anesthetic techniques, however, this complication rarely occurs.<sup>2</sup> Neck infection, including suppurative lymphadenitis, is also a rare complication.<sup>27</sup>

### **Dehydration**

While postop dehydration may be uncommon in the "average" patient, the risk is more common among dysphagic children. Posttonsillectomy vomiting worsens this situation. With that in mind, encourage patients to resume oral intake of fluids and, when necessary, provide analgesia to facilitate the process. You will need to readmit patients who are unable to drink to achieve better pain relief and restore hydration.<sup>28</sup>

Some reports suggest that severe posttonsillectomy hyponatremia can result from excessive hypovolemia-induced antidiuretic hormone secretion, disproportionate administration of hypotonic fluids, or inadequate postop fluid intake.<sup>29,30</sup>

Encouraging patients to consume soft and cold foods after tonsillectomy will comfort patients and help restore hemostasis. Because pain is the major obstacle for a return to an oral diet, coupling analgesia and timing of oral intake is crucial for a quick recovery.

### **Injuries from a forceful surgical technique**

Because tonsillectomy requires forceful insertion of instruments into the mouth, a

TABLE 3

## Tonsillectomy techniques

Technique	Instrumentation	Method
“Cold steel”	Scalpel, dissector, guillotine	Complete blunt dissection of the tonsil from its capsule, while preserving its pillars
“Hot”	Diathermy, BiClamp forceps	Complete electrodissection of the tonsil from its capsule, while preserving its pillars
Powered intracapsular	Microdebrider	Near-complete removal of the tonsil (90%-95%)
Harmonic scalpel	Harmonic scalpel	Use of ultrasound energy to remove the tonsil
Coblation	Bipolar device	Use of radiofrequency energy to remove the tonsil in a cooler temperature
Laser	CO <sub>2</sub> , KTP lasers	Evaporization of tonsillar tissue

Source: Shah UK, Terk A. New techniques for tonsillectomy and adenoidectomy. *Oper Tech Otolaryngol*. 2009;20:160-166.

loose tooth may become dislodged, or even aspirated. We don't recommend routine preoperative dental consultation, but do urge a watchful eye. (See TABLE 3 for details on tonsillectomy techniques.)

Temporary uvular or tongue edema can develop if the tissues were forcefully manipulated during surgery, causing the patient to feel like he or she is choking. This edema usually subsides within a few days. Additional steroid dosing can be helpful.

If the glossopharyngeal nerve is damaged during dissection or electrocautery, the patient may develop a taste disorder.<sup>31</sup> Spontaneous healing often occurs within several weeks.

An inadvertent eye injury such as keratitis may occur from exposure or friction from surgical covers. Skin, lip, and buccal mucosa lacerations or burns may also occur, often with the use of electrocautery needles and probes.

Mandibular condyle fracture is a rare complication that can be caused by forceful opening of the mouth. Forceful opening and the use of muscular relaxants lead to dislocation or stress injury of the temporomandibular joint (TMJ).<sup>32</sup> This TMJ disorder is treated with analgesia, soft diet, and possible surgical reduction.

Excessive hyperextension of the neck can cause muscular tension and severe neck pain after the surgery. The atlanto-axial joint is at highest risk for dislocation or sub-

luxation, especially in patients with Down syndrome—10% of whom already have atlanto-axial joint hyperlaxity.<sup>33</sup> With that in mind, neck radiographs should be taken prior to surgery to assess the atlanto-axial joint stability in patients with Down syndrome.

In the rare Grisel's syndrome, patients complain of severe neck pain about a week after surgery, with limitation in neck movements and torticollis. This is due to an impaired venous drainage from the joint, local infection, and injury to the paraspinal ligaments.<sup>34</sup> Treatment consists of rest, neck immobilization, and antibiotics.

#### Complications when an adenoidectomy is also done

There is an increased risk of complications when an adenoidectomy and tonsillectomy are performed together, simply because there is another operative site. The complications that may occur after adenoidectomy include velopharyngeal insufficiency and nasopharyngeal stenosis. Primary care physicians should watch for nasal or oral bleeding, crusting, halitosis, and velopharyngeal insufficiency. An ear, nose, and throat consultation is warranted when in doubt. **JFP**

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**A meta-analysis suggests that postop oral antibiotics don't reduce infection rates, posttonsillectomy pain, or secondary hemorrhage rates.**

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