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## Introduction

Tonsillectomy is one of the most frequently performed surgical procedures in Uzbekistan, with over 5000 operations annually in children under 15 years of age. The two primary indications for this procedure are sleep-disordered breathing (SDB) and recurrent throat infections. Complications of tonsillectomy can include bleeding, velopharyngeal insufficiency, and dehydration. Uzbekistan Academy of Otolaryngology-Head and Neck

## REMOVAL OF TONSILS AND ADENOIDS

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## ABSTRACT

**Continuing Education Activity.** *The American Academy of Otolaryngology-Head and Neck Surgery defines tonsillectomy as a surgical procedure that removes the tonsil, including its capsule, by dissecting the peritonsillar space between the tonsil capsule and the muscular wall. It may be performed with or without adenoidectomy. In Uzbekistan, tonsillectomy is among the most frequently performed surgeries, with over 5000 cases annually in children under 15 years old. The procedure is commonly indicated for conditions such as sleep-disordered breathing and recurrent throat infections. Potential complications include bleeding, velopharyngeal insufficiency, and dehydration. This activity outlines the indications, contraindications, and surgical technique for tonsillectomy and emphasizes the importance of an interprofessional team approach in managing patients pre- and postoperatively.*

### Objectives:

- Identify the indications for performing a tonsillectomy.
- Describe the surgical technique involved in a tonsillectomy.
- Review the clinical presentation of patients undergoing tonsillectomy.
- Explain the role of a structured interprofessional team in providing effective care and monitoring for patients undergoing tonsillectomy.



Surgery defines tonsillectomy as a surgical procedure that removes the tonsil, including its capsule, by dissecting the peritonsillar space between the tonsil capsule and the muscular wall. In certain contexts, particularly those related to SDB, tonsillectomy may also include adenoidectomy.

### **Anatomy and Physiology**

The palatine tonsils are part of Waldeyer's ring, a collection of lymphoid tissue that also includes the adenoids, tubal tonsils, and lingual tonsils. The tonsils are separated from surrounding musculature by a fibrous capsule derived from the pharyngobasilar fascia. The peritonsillar space lies between this capsule and the underlying muscle. The tonsils are located between the palatoglossus and palatopharyngeal muscles, which form the anterior and posterior pillars, respectively, with the superior constrictor muscle lying lateral to the tonsils.

The glossopharyngeal nerve runs deep to these muscles and is at risk of injury during tonsillectomy, potentially causing taste disturbances or referred otalgia. The blood supply to the tonsils is rich and comes from branches of the external carotid artery, including the lingual, facial, ascending pharyngeal, and internal maxillary arteries. Variations in this vascular architecture are not uncommon.

### **Indications**

The two most common indications for tonsillectomy are sleep-disordered breathing (SDB) and recurrent tonsillitis.

- **Sleep-Disordered Breathing (SDB):**

SDB involves partial or complete upper airway obstruction during sleep, disrupting normal ventilation and sleep patterns. Diagnosis is based on history and physical examination, with symptoms including hyperactivity, daytime fatigue, and aggression. Signs may include loud snoring, witnessed apnea, restless sleep, growth retardation, poor school performance, and nocturnal enuresis. Children with SDB have significantly increased healthcare usage, including more upper respiratory infections and hospital visits. While tonsillar and adenoid hypertrophy is the most common cause of SDB, tonsillar size does not always correlate with SDB severity. Polysomnography can help evaluate patients with symptoms of SDB who lack tonsillar hypertrophy.

- **Recurrent Tonsillitis:**

Watchful waiting is recommended for patients with fewer than seven episodes in the past year, fewer than five episodes annually over the past two years, or fewer than three episodes annually over the past three years. If infections exceed these thresholds, tonsillectomy is considered. Each documented infection should include a sore throat and at least one of the following: fever  $>38.3^{\circ}\text{C}$ , cervical adenopathy, tonsillar exudates, or positive GABHS. Modifying factors such as antibiotic intolerance, PFAPA (periodic fever, aphthous stomatitis, pharyngitis, and adenitis), or a peritonsillar abscess may justify earlier surgical intervention.

Other indications include tonsillar asymmetry (to rule out malignancy) and confirmed malignancies. Squamous cell carcinoma and lymphoma are the most common malignancies in the palatine tonsils, with lymphoma being the most frequent in children.

### **Contraindications**



There are no absolute contraindications for tonsillectomy. However, the major risks associated with the procedure are bleeding and complications related to anesthesia. Therefore, any risk factors, such as bleeding disorders or a family history of malignant hyperthermia, should be identified and managed preoperatively with appropriate precautions.

### **Equipment**

The required equipment for tonsillectomy varies depending on the technique used:

- **Cold Tonsillectomy:** Instruments include a Crowe-Davis or McIvor mouth gag, Allis clamp, no. 12 scalpel, curved Metzenbaum scissors, Fisher tonsil knife/dissector, Tyding snares, adenoidectomy currettes, and St. Clair-Thompson adenoid forceps.
- **Hot Tonsillectomy:** Typically performed using monopolar cautery. Other options include bipolar radiofrequency ablation (coblation) and microdebrider techniques, especially for intracapsular tonsillectomies.

### **Personnel**

The team required for a tonsillectomy includes a surgeon, an anesthesiologist, a surgical technician, and a circulating nurse.

### **Preparation**

Anesthesia is induced similarly across techniques. The patient is positioned supine and orally intubated, typically with an oral RAE endotracheal tube, which is taped at the midline. The operating table is turned 45 to 180 degrees to allow the surgeon to work comfortably at the patient's head. A shoulder roll is placed, and a McIvor or Crowe-Davis mouth gag is used to keep the patient's mouth open during the procedure.

### **Technique or Treatment**

Tonsillectomy can be performed as either extracapsular or intracapsular, with various techniques available:

- **Hot Extracapsular Technique (Monopolar Cautery):**

The tonsil is grasped with an Allis clamp, medialized, and the lateral edge is identified submucosally. Incision at the superior pole is made using around 20W of power. The avascular plane between the tonsil and surrounding musculature is dissected, removing the entire tonsil from the superior to the inferior pole. Hemostasis is achieved using packing, suction cautery, or ties.

- **Cold Tonsillectomy:**

Performed using sharp dissection. The tonsil is grasped with an Allis clamp, medialized, and incised at the lateral edge with a no. 12 scalpel. Metzenbaum scissors are used to identify the avascular plane, and the tonsil is removed with a Fisher dissector. The Tyding snare separates the tonsil at the inferior pole. Hemostasis is maintained with pressure from a tonsil sponge, suction cautery, or ties.

- **Coblation:**

Uses saline irrigation that forms an ionized plasma layer, causing molecular tissue breakdown with minimal heat generation. This technique is often used for partial tonsillectomies.

- **Microdebrider Technique:**

Typically employed for partial tonsillectomy, the microdebrider removes tissue with precise control and minimal thermal injury.



## **Comparative Debate**

The choice of technique depends on factors such as cost, complication rates (e.g., bleeding), operating time, and postoperative pain. "Cold" tonsillectomy is thought to result in less postoperative pain, while "hot" tonsillectomy often leads to reduced intraoperative blood loss and shorter surgical times. Ultimately, the technique chosen depends on the surgeon's expertise and preference.

## **Complications**

Bleeding is one of the most common and concerning complications following tonsillectomy, with or without adenoidectomy. A study involving over 100,000 children from 2009 to 2013 found that 2.8% of patients experienced unplanned revisits due to bleeding, 1.6% presented to the emergency department, and 0.8% required additional procedures. Bleeding is more frequent at night, particularly between 10 PM–1 AM and 6 AM–9 AM, potentially due to circadian rhythm changes, snoring-induced vibration in the oropharynx, or mucosal drying from mouth breathing. Patients with known bleeding disorders are at a significantly higher risk.

Postoperative nausea and vomiting (PONV) is another common complication, affecting up to 70% of patients without prophylactic antiemetic treatment. PONV can increase hospital admissions, the need for intravenous hydration, additional pain medication, and reduce patient satisfaction. A single intraoperative dose of dexamethasone is recommended to mitigate these effects, and some clinicians also prescribe a single dose of ondansetron for outpatient surgeries, as PONV is most likely to occur within 24 hours post-surgery.

Pain is the leading cause of morbidity following tonsillectomy, often resulting in decreased oral intake, dehydration, dysphagia, and weight loss. Caregivers must be vigilant in monitoring for signs of dehydration and encourage hydration. Alternating acetaminophen and ibuprofen on a scheduled basis can help reduce oropharyngeal pain.

Velopharyngeal insufficiency is another potential complication, presenting as hypernasal speech or food regurgitation through the nasal passage during feeding.

## **Clinical Significance**

Tonsillectomy is among the most commonly performed surgical procedures in children in the United States. It is critical for primary care physicians and otolaryngologists to understand the indications, contraindications, and associated risks to educate patients and their caregivers effectively. Surgeons must have a thorough understanding of oropharyngeal anatomy to perform safe procedures and minimize postoperative complications.

## **Enhancing Healthcare Team Outcomes**

The following guidelines from the American Academy of Otolaryngology–Head and Neck Surgery's Clinical Practice Guideline for Tonsillectomy in Children emphasize evidence-based recommendations:

### **1. Recurrent Throat Infections:**

- Recommend watchful waiting for children with fewer than 7 infections in the past year, fewer than 5 per year in the past 2 years, or fewer than 3 per year in the past 3 years.
- Consider tonsillectomy for recurrent infections exceeding these thresholds, with documentation of sore throat episodes that include at least one of the following: fever  $>38.3^{\circ}\text{C}$ , cervical adenopathy, tonsillar exudates, or a positive GABHS test.



- Evaluate modifying factors like multiple antibiotic allergies, PFAPA syndrome, or a history of peritonsillar abscess for earlier surgical intervention.
- 2. **Sleep-Disordered Breathing (SDB):**
  - Assess for comorbidities such as growth retardation, poor school performance, enuresis, and behavioral problems that might improve after tonsillectomy.
  - Counsel caregivers about the potential health benefits of tonsillectomy in children with abnormal polysomnography results and tonsil hypertrophy.
  - Advise caregivers that SDB may persist or recur postoperatively and might require further management.
- 3. **Perioperative Management:**
  - Administer a single intraoperative dose of intravenous dexamethasone to reduce PONV and swelling.
  - Avoid routine administration or prescription of perioperative antibiotics.
  - Emphasize pain management postoperatively and educate caregivers on its importance and monitoring.
- 4. **Quality Monitoring:**
  - Surgeons should evaluate their rates of primary and secondary post-tonsillectomy hemorrhage annually to ensure quality care.

These evidence-based recommendations highlight the need for an interprofessional approach to ensure optimal outcomes and minimize complications in children undergoing tonsillectomy.

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