



# Tonsillectomy and Adenoidectomy 101:

## *Procedure and Implications for the Surgical Technologist*

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### HISTORY

**T**onsillectomies and adenoidectomies are one of the oldest surgical procedures known to man, dating back to before the sixth century.<sup>1</sup> Aulus Cornelius Celsus was a Roman physician and writer who removed tonsils by loosening them up with his finger and then tearing them out.<sup>2</sup> Vinegar mouthwash and other primitive medications were the only form of hemostasis. The procedure advanced to the hook and knife method, which was followed by the tonsil guillotine, before the use of a scalpel was finally implemented in 1906.<sup>2</sup>

### LEARNING OBJECTIVES

- Compare treatment techniques for tonsillectomy throughout history
- Examine the current spectrum of surgical options for tonsillectomy
- Assess the implications for the surgical technologist during this procedure
- Explain the steps for patient and O.R. preparation for a tonsillectomy
- Evaluate the advancement in technology as it relates to tonsil and adenoidectomy

## INTRODUCTION

The incidence of tonsillectomy and adenoidectomy continues to rise – it has been estimated that 200,000 of these operations are being performed annually in the United States.<sup>3</sup> Most tonsillectomies and adenoidectomies are performed on children. While teenagers and adults are not exempt, the procedure is less common in these age groups. The main indication for this procedure is a chronic infection as a result of streptococcus or staphylococcus bacteria. Tonsillar hyperplasia, causing airway obstruction, or malignancies are other indications for surgery. The removal of only the adenoids can be performed to treat recurrent ear infections. Due to this prevalence, the surgical technologist must be adept at these procedures to be an intricate part of the surgical team.



## ANATOMY

Tonsillectomy is the removal of the palatine or faucial tonsils, which are lymphatic tissue, in the lateral pharyngeal wall of the oralpharynx. Blood supply is provided via the ascending and descending palatine arteries, tonsillar artery and all small branches of the external carotid artery. The tonsillar capsule is a thin layer of fibrous tissue around each tonsil. The tonsillar fossa is composed of three muscles: the palatoglossus muscle,

palatopharyngeal muscle and the superior constrictor muscle. The palatoglossus muscle forms the anterior pillar and the palatopharyngeal muscle forms the posterior pillar. The tonsillar bed is formed by the superior constrictor muscle of the pharynx.

Adenoid tissue is lymphoid tissue located midline in the nasopharynx. The adenoids usually enlarge in patients 2.5-years old to 5-years old and then decrease in size in patients around 11-years old, usually becoming atrophic in teenagers. To this day, there is still controversy over the function of the tonsils and adenoids. Those who have the tonsils and adenoids removed do not have an adverse effect on immune status or health and, in fact, asthmatics have a beneficial effect postoperatively.

## TRADITIONAL METHOD

The methods of removing tonsils vary and are related to the surgeon's preference based on the patient's age, indications and technology available. Traditional or extracapsular tonsillectomy refers to the removal of all tonsillar tissue along the capsule. Intracapsular tonsillectomy indicates the removal of 90-95 percent of the tonsillar tissue, where a thin layer of tonsillar tissue is deliberately left intact as a protective shield.<sup>4</sup> This technique decreases postoperative pain, quickens recovery, and aids in fewer readmissions for complications. The potential does exist for tonsils to grow back, and they may become infected.

Traditionally the mouth is retracted and held open with a self-retaining mouth gag, while the tongue is depressed with a tongue blade of which the distal end is stabilized on the edge of a mayo stand. The posterior and lateral walls of the palate are carefully inspected and palpated to detect abnormally positioned vessels.<sup>5</sup> The superior pole of the tonsil is grasped with a long curved Allis and the mucosa of anterior and posterior tonsillar pillars are outlined via electrocautery, preserving the posterior tonsillar pillar. Using a Hurd dissector, the plane of the tonsillar capsule is located and the tonsil is removed by careful dissection with electrocautery. Counter traction is applied with the Allis clamp. The attachment

of the inferior portion of the pharyngeal tonsil to the lingual tonsil is transected, also via cautery or tonsil snare, and the tonsil is completely removed.<sup>5</sup> Plain gut suture can be utilized to ligate small vessels to prevent bleeding. Tonsil ties can be made by creating a slip knot with a free plain gut tie. This is then placed around the vessel that is clamped. Any residual bleeding vessels are addressed at this time and a tonsil sponge is placed for pressure to aid in coagulation. This procedure is then repeated on the opposite side. Upon completion, the pharynx is inspected, the mouth gag is removed, and the jaw is examined prior to extubation.

Intracapsular tonsillectomies can be performed utilizing the same suspension and similar instrumentation, but the blunt dissection is unnecessary due to the fact that the tonsil is vaporized or shaved, leaving a portion of the tonsil behind.

#### ADDITIONAL METHODS

Other methods can be utilized, such as CO<sub>2</sub>, KTP or Nd:Yag laser to vaporize the tonsillar tissue directly or through a microscope or endoscope. Each of these lasers requires safety precautions that must be taken, specific to the type of laser used. All lasers must be operated by a qualified person who has completed specific laser competencies. The operating room must be equipped with laser signs, proper eye wear for not only the staff, but the patient, and appropriate laser instrumentation. It is recommended that water is also available in a basin in order to put out any fire that can quickly ignite when using laser equipment. The laser affords the patient less postoperative pain, more rapid healing, less blood loss, and less operative time.<sup>2</sup>

A microdebrider which is a powered rotary shaving device with continuous suction can be used to shave out the tonsil using the intracapsular approach. This microdebrider can also be

attached to bipolar cautery to enhance its effect by coagulating while shaving. Often monopolar cautery is used in conjunction with the shaver to control bleeding.

A harmonic scalpel can also be utilized, which is a high-frequency ultrasound vibration of a titanium blade to precisely cut and coagulate tonsil tissue with minimal thermal tissue damage. This blade vibrates at 55.5 kHz and actually breaks hydrogen bonds of proteins to generate heat from

tissue friction.<sup>2</sup> The thermal tissue damage is less, due to the lower temperature of the harmonic scalpel.

Some surgeons may choose to use the Coblator, which is a bipolar radiofrequency low-level energy device that transfers to sodium

ions, creating a thin layer of plasma.<sup>2</sup> This shrinks the tonsil tissue and, after 8-12 weeks, the residual tissue is reabsorbed by the body.<sup>6</sup> This effect is achieved at low levels of temperature causing minimal thermal tissue damage, which in turn alleviates postoperative pain.

A newer technique that is still emerging is the use of the PlasmaKnife. A low-temperature plasma field is created by a triode-tipped instrument with a bipolar coagulation to precisely and hemostatically remove the tonsils with less pain. The process also affords the patient accelerated healing.<sup>7</sup> This method creates minimal collateral thermal damage to the tonsil fossa and many patients can resume normal eating and drinking quickly after surgery.

Adenoids, being a midline structure and located in the superior nasopharynx, must be visualized by inserting a red rubber catheter nasally and pulling it out through the mouth to retract the soft palate. A laryngeal mirror is utilized to carefully visualize the adenoid tissue during the procedure. A nasal endoscope can also be helpful to visualize the superior adenoid and check for choanal obstruction. Adenoidectomies can be performed via cautery to vaporize the tis-

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sue, an adenotome or curette to scrape the tissue, a microdebrider to shave the tissue or a Coblator to shrink the tissue. After removal of the adenoid, the remaining bed is packed with a tonsil sponge, preferably soaked in saline to avoid the risk of airway fire during cauterization proximal to this site.<sup>5</sup>

#### **PATIENT AND O.R. PREPARATION**

The patient is placed on the operating room bed in a supine position with the arms preferably at the sides. General anesthesia is the most common method, especially for children, and is delivered with intravenous sedation and inhalation gases. An endotracheal tube is placed and a shoulder roll may be positioned to gently extend the neck for better surgical exposure. Adults may have the procedure performed under intravenous sedation and local anesthesia, depending on the surgeon and patient preference.

Tonsillectomy and adenoidectomy is a clean procedure and no skin prep is required, but sterile instruments are imperative due to the exposure of blood vessels. A sheet is draped over the patient's body and a head drape is applied. The mayo stand is brought over the patient's chest for the suspension of the mouth gag. It is customary for the surgeon to sit on a rolling stool for the procedure, but it is suggested that the surgical technologist either sit or remain standing for the entire procedure.

Equipment needs will differ from hospital to hospital, but a headlight, electrosurgical unit and rolling chair for the surgeon are necessary. A tonsillectomy tray of instruments will be required and additional supplies, such as surgeon-specific device to remove tonsils, drapes, towels, gloves, suction, basin set and nasogastric tube, are necessary for surgery.

#### **POSTOPERATIVE COMPLICATIONS**

Postoperative complications share the general risks of any surgical procedure associated with general anesthesia, bleeding, infection and dehydration. Anesthesia risks are directly related to the health of the patient and are rare. Bleeding, the most prevalent complication, usually occurs five to 10 days postoperatively, when the eschar, or scab, begins to fall off. At this point, it may be necessary to emergently return to the operating room for evaluation and possible cauterization. Low-grade fevers from infections are possible

and antibiotics are usually given intraoperatively and continued at home. Dehydration may also be a concern. Due to the pain associated with this procedure, the patient may not receive enough fluids by mouth to maintain proper hydration and may have to return to the hospital

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for intravenous fluids.

Parents of young patients are encouraged to notice, and if necessary, keep a postoperative daily log of amounts of fluids and soft foods ingested, amount of urine output and any bleeding that occurs. This data can be utilized when determining dehydration status, assessing inadequate nutrition needed for proper healing or addressing recurrent bleeding.

#### **IMPLICATIONS FOR THE SURGICAL TECHNOLOGIST**

The surgical technologist must keep in mind that the surgeon's preference will dictate the equipment and order of the procedure. Adenoids are generally removed first, unless the size of the tonsils obstructs the visualization of the adenoids. Suction devices should be checked prior to the patient entering the operating room in order to have quick access to suction if needed. Suction must always be available during the entire procedure, especially during dissection, to keep the surgical field visible. Upon completion of

the procedure, it may be needed to suction the stomach prior to emersion from anesthesia. The surgical field must always remain sterile at the completion of the surgery during extubation due to the possibility that a complication may arise, bleeding occurs or possible aspiration.

A competent surgical technologist will time the length of suspension of the mouth gag and keep the surgeon well informed to prevent swelling of the tongue, decreased blood flow to the tongue or excessive jaw pain postoperatively. It is imperative that the surgical technologist be vigilant and careful not to apply any additional tension on the suspended mouth gag by leaning on the mayo stand or even moving the mayo stand during suspension. The surgical technologist must be competent and knowledgeable of the anatomy, surgical procedure and possible complications that may arise in order to provide safe patient care.

## CONCLUSION

The evolution of tonsil surgery has been vast and new techniques have emerged improving on the postoperative co-morbidities associated with tonsillectomies and adenoidectomies. The responsibilities of new techniques do not solely lie with the institution or the doctor, but also with the surgical technologist that assists in the procedure. Competencies must personally be maintained through continuing education, staff meetings and personal acquisition of knowledge. New techniques will always be surfacing and it is a challenge for surgical technologists to stay abreast of new information as it becomes available.

## ABOUT THE AUTHOR

Theresa Criscitelli, CST, RN, CNOR, has been in the O.R. for 22 years and is an assistant nurse manager at Winthrop University Hospital in Mineola, New York. She is also a clinical instruc-

tor of Surgical Technology at Nassau Community College and will be obtaining her Master's Degree in nursing education in May 2010. Her clinical specialty is ENT surgery and educating staff and students.

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- Recurrent ear infections can be treated with the removal of the \_\_\_\_\_.
  - Tonsillar fossa
  - Tonsillar capsule
  - Adenoids
  - All of the above
- \_\_\_\_\_ decreases postoperative pain, quickens recovery and aids in fewer readmissions for complications.
  - Intracapsular tonsillectomy
  - Extracapsular tonsillectomy
  - Supercapsular tonsillectomy
  - Electrocautery
- The use of a laser affords the patient \_\_\_\_\_.
  - Less postoperative pain
  - More rapid healing
  - Less blood loss
  - All of the above
- \_\_\_\_\_ is a powered rotary shaving device with continuous suction.
  - Plasma knife
  - Harmonic scalpel
  - Coblator
  - Microdebrider
- \_\_\_\_\_ is a bipolar radiofrequency low-level energy device that transfers to sodium ions, creating a thin layer of plasma.
  - Plasma knife
  - Harmonic scalpel
  - Coblator
  - Microdebrider
- A \_\_\_\_\_ uses the high-frequency ultrasound vibration of a titanium blade to cut and coagulate tissue with minimal thermal tissue damage.
  - Plasma knife
  - Harmonic scalpel
  - Coblator
  - Microdebrider
- After adenoid removal, tonsil sponges should be soaked in saline prior to application to \_\_\_\_\_.
  - Avoid the risk of airway fire
  - Avoid wound contamination
  - Promote hemostasis
  - Promote adhesion
- Required elements for the surgeon during a tonsillectomy include \_\_\_\_\_.
  - A rolling chair
  - A headlight
  - An electrosurgical unit
  - All of the above
- \_\_\_\_\_ is required throughout the procedure to keep the surgical field visible.
  - A headlight
  - A mouth gag
  - Suction
  - A tonsil sponge
- Timing the length of suspension of the mouth gag prevents \_\_\_\_\_.
  - Swelling of the tongue
  - Decreased blood flow to the tongue
  - Excessive postoperative jaw pain
  - All of the above

### Tonsillectomy and adenoidectomy 101

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