



Tonsillectomy the Unknown Facts

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ABSTRACT

At the back of your throat, two masses of tissue called tonsils act as filters, trapping germs that could otherwise enter your airways and cause infection. They also produce antibodies to fight infection. But sometimes the tonsils themselves become infected. Overwhelmed by bacteria or viruses, they swell and become inflamed, a condition known as tonsillitis. Treatment for tonsillitis will depend in part on the cause. To determine the cause, your doctor may perform a rapid strep test or throat swab culture. Both tests involve gently swabbing the back of the throat close to the tonsils with a cotton swab. A lab test can detect a bacterial infection. A viral infection will not show on the test, but may be assumed if the test for bacteria is negative. In some cases, the physical findings are convincing enough to diagnose a probable bacterial infection. In these cases, antibiotics may be prescribed without performing a rapid strep test. In case of surgical complications newer techniques have been implemented.

Introduction

Tonsillectomy is the surgical removal of the tonsils, two oval-shaped pads of tissue at the back of the throat — one tonsil on each side. A tonsillectomy was once a common procedure to treat infection and inflammation of the tonsils (tonsillitis). Today, a tonsillectomy is usually performed for sleep-disordered breathing but may still be a treatment when tonsillitis occurs frequently or doesn't respond to other treatments.

A tonsillectomy may also be necessary to treat breathing and other problems related to enlarged tonsils and to treat rare diseases of the tonsils. Recovery time for a tonsillectomy is usually at least 10 days to two weeks.¹

Who needs Tonsillectomy?^{2, 3}

Tonsillitis and the need for tonsillectomies are more common in children than adults. However, people of any age can experience trouble with their tonsils and require surgery. One case of tonsillitis is not enough to warrant a tonsillectomy. Usually, the surgery is a treatment option for those who are often sick with tonsillitis or strep throat.

Tonsillectomy can also treat other medical problems, including:

- ✓ Breathing problems related to swollen tonsils
- ✓ Frequent and loud snoring
- ✓ Periods in which you stop breathing during sleep, or sleep apnea
- ✓ Bleeding of the tonsils
- ✓ Trouble swallowing chewy foods, especially meats
- ✓ Cancer of the tonsils

Possible complications⁴

Tonsil surgery is very safe, but every operation has a small risk. The most serious problem is bleeding. This may need a second operation to stop it. About two out of every 100 children who have their tonsils out will need to be taken back into hospital because of bleeding, and one of these will need a second operation. As many as five adults out of every 100 who have their tonsils out will need to be taken back into hospital because of bleeding, but only one adult out of every 100 will need a second operation.

Advancement in Tonsillectomy⁵

Owing to the recent advancement in technology, such as the use of radiofrequency surgery and carbon dioxide (CO2) laser, "modern tonsillectomy", the partial removal of the tonsils as necessary to ease the patient's symptoms, was possible. This procedure was widely performed in the United States, several European countries, as well as in India and Bangladesh.

The past decade has seen an increase in the use of the harmonic scalpel, the powered tissue microdebrider, and the plasma excision device. The harmonic scalpel is used to perform total tonsillectomy, the powered tissue microdebrider is used for intracapsular tonsillectomy, and the plasma excision device can be used for both procedures (table). Surgeons find these instruments attractive because they can remove tissue with greater accuracy and less damage to adjacent tissue and, in many cases, they can do so with more speed and ease than is possible with older methods. Because these technologies are relatively new, it is helpful to review how they work.

Harmonic scalpel⁶

It is equipped with vibrating titanium blades that cut at a frequency of approximately 55.5 kHz. The blades move only approximately 80 [micro]m during each cycle. The scalpel has two speed settings, full and variable, and five levels of power. By generating between 60 and 100[degrees]C of heat, the harmonic scalpel promotes hemostasis by creating protein coagulum, which results in vessel coaptation and the fusion of smaller vessels. The relatively low level of heat also minimizes damage to surrounding tissues. However, traditional electrocautery is often required to control vessels larger than 1 mm in diameter.

Each harmonic scalpel blade has three surfaces that can be used: a sharp hook facet, which cuts most aggressively; a blunter facet, which is used for less aggressive cutting and for hydrodissection; and a back side, which is used for hemostasis. Thus, by using different power settings and blade surfaces and by varying the tissue tension, surgeons can take advantage of the versatility of this instrument to achieve optimal ablation and hemostasis.

Powered Tissue Microdebrider⁵

The powered tissue microdebrider is a familiar and relatively simple device that is widely used in sinus surgery and adenoidectomy and is available in most operating rooms. In most cases, the device's adenoidectomy-style blades are used to perform intracapsular tonsillectomy. Several manufacturers have now developed blades specifically for tonsillectomy.

The handpiece is equipped with a motor, a suction device, and an attached hollow blade. A foot pedal controls the speed of the blade. As the motor spins, the debrider sucks tissue into a small aperture that contains the oscillating blade, which essentially shears off the tissue. This shearing force provides hemostasis for small vessels. The microdebrider removes the bulk of tonsillar tissue rapidly; it requires only about 5 minutes to treat each tonsil. The choice of blade design and the level of suction determine the aggressiveness of the procedure. During surgery, the only variable is the number of revolutions per minute (rpm) that the blade turns. The recommended setting for tonsillar surgery is 1,500 rpm. In all cases, after the tissue has been removed, a separate device is needed to provide complete hemostasis.

Plasma excision device.⁷

Plasma excision, formerly known as Coblation, can be used to perform both total tonsillectomy and intracapsular tonsillectomy. The plasma excision device is a product of radiofrequency technology. Within a plasma excision Wand, radiofrequency energy is used to excite electrolytes in a conductive medium, such as saline solution, and create a precisely focused plasma field. The excited particles in the plasma possess enough energy to break molecular bonds, and they can excise or dissolve soft tissue at relatively low temperatures (typically 40 to 70[degrees]C), which helps preserve the integrity of the surrounding healthy tissue. These relatively low temperatures are still high enough to control bleeding in smaller vessels, even in bipolar cautery mode. To achieve hemostasis in larger vessels, the surgeon can use the bipolar cautery that is built into the Wand by depressing an alternate foot pedal.

The plasma excision device has tissue ablation and cautery capabilities that are controlled by the design of the handpiece or Wand. Each device has four essential components: an active electrode(s), a return electrode, a suction port, and a saline drip port. The active electrode array is located in the tip of the Wand and is insulated from the return electrode, which is typically located in the lower shaft of the Wand. The radiofrequency energy that enlists the plasma field is established from these two electrodes. Saline between these electrodes is vital for plasma development; otherwise, the device acts as a weak bipolar cautery device. The saline from the saline drip port is designed to drip onto the electrodes; the saline drip port is connected to a bag of normal saline. Given that the process of plasma excision of tissue produces molecular debris and gas, suction to remove this material is important to allow for visualization of the dissection process. Thus, strong suction is built into the shaft of the Wand and suction is connected to a suction canister.

The overall aggressiveness of the tissue ablation compared with the amount of heat generated by a particular plasma Wand is determined primarily by the Wand's design, its electrode composition, and the design of the electrode array. When the voltage is changed, the same active and return electrodes can deliver low-power bipolar electrocautery through the Wand. The surgeon can also determine the relative aggressiveness of the dissection to a certain degree by changing the plasma power setting on the controller unit, and the cautery power setting controls the hemostatic power. The plasma power setting will increase the aggressiveness of the tissue ablation, but at the same time it will decrease the plasma field's ability to cauterize smaller blood vessels.

Placing an adequate amount of saline over the electrodes is of paramount importance in creating the plasma field. If an insufficient amount of saline is used, the device cannot perform excision, only cautery. The surgeon can ensure that sufficient saline is present for excision by using a pressure bag on the saline delivery system or a bulb to manually deliver additional saline.

The newer generation of Wands features much more aggressive electrode arrays and improved suction design to specifically speed up tonsillar surgery. In addition, the bipolar cautery has also been enhanced by the Wand's design. The suction design uses a larger portal, which makes clogging by tissue fragments rare.

Modern Tonsillectomy using a CO2 Laser

A CO2 laser can be applied to a variety of tonsil diseases. For example, in a patient with tonsil stone (tonsillolith), which is a common cause of foul-smelling breath, CO2 laser cryptolysis or the widening of tonsil clefts can be performed. CO2 laser resurfacing of the tonsil gland can be done in a patient suffering from recurrent tonsil infection. In a patient with severe pathology of the tonsils, a CO2 laser tonsil ablation, the removal of most tonsil tissues while saving only the external part of tonsil gland can be done.

Benefits of CO2 Laser Surgery The procedure can be performed using a topical and local anesthesia. Blood loss is minimal (1-2 cc) compared to 50-150 cc in traditional tonsillectomy. Bleeding complications after the procedure can be seen in 2-5% of the cases, comparable to those undergo a traditional tonsil surgery. Hospitalization is not necessary. The laser surgery is performed in the outpatient department, and the patients are typically sent home on the same day of the procedure. While in traditional tonsillectomy cases, patients are generally admitted to the hospital for 2-3 days.

The patients usually suffer less pain than those undergo traditional surgery. The patients tend to recover fast, and can be back to work within 1-2 days after the procedure. In traditional tonsillectomy cases, full recovery usually takes 1-2 weeks. In the United States, the CO2 laser tonsillectomy procedure is available in every state. Due to the benefits mentioned above, the modern tonsillectomy is becoming more popular.

REFERENCE

- [1] Maqbool M, Maqbool S: Textbook of Ear, Nose and Throat Diseases: JP Medical Ltd, 2013.
- [2] Audit NPT, van der Meulen J: Tonsillectomy technique as a risk factor for postoperative haemorrhage. *The Lancet* 2004, 364:697-702.
- [3] Hoddeson EK, Gourin CG: Adult tonsillectomy: current indications and outcomes. *Otolaryngology--Head and Neck Surgery* 2009, 140:19-22.
- [4] Randall DA, Hoffer ME: Complications of tonsillectomy and adenoidectomy. *Otolaryngology--Head and Neck Surgery* 1998, 118:61-8.
- [5] Lee KC, Bent III JP, Dolitsky JN, Hinchcliffe AM: Surgical advances in tonsillectomy: report of a roundtable discussion. *Ear, nose & throat journal* 2004, 83:4.
- [6] Ali NS, Ikram M, Akhtar S, Moghira I, Nawaz A, Arain A: Harmonic scalpel versus electrocautery tonsillectomy: a comparative study in adult patients. *Journal of the Pakistan Medical Association* 2011, 61:256.
- [7] Burton MJ, Doree C: Coblation versus other surgical techniques for tonsillectomy. *The Cochrane Library* 2007.