

A novel concept for adenoidectomy surgery

Abstract

Nasopharyngeal lymphoid tissues, the adenoids are considered pathological if they cause mechanical blockage of the nasopharyngeal airway, distort or block the eustachian tube orifice leading to various middle ear conditions like serous otitis media, conductive hearing loss, chronic suppurative otitis media etc. They may also be a source of chronic infection. The treatment is primarily surgical for refractory adenoids unresponsive to medical treatment and also their persistence in adolescence and adulthood. Various techniques have been used to remove the adenoids – commonest being curettage.

Keywords: adenoidectomy, nasopharynx, endoscopic, radiofrequency energy

Volume 16 Issue 3 - 2024

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Received: August 15, 2024 | **Published:** September 02, 2024

Introduction

The adenoids, also known as the Nasopharyngeal Tonsils, are a mass of lymphoid tissue located in the nasopharynx, the area where the nose and throat connect. They are part of the immune system and play a role in protecting the body from infections, particularly during childhood.

Adenoids trap and destroy pathogens that enter the body through the nose or mouth. However, as children grow, the adenoids typically shrink and become less important for immune function, often disappearing by adolescence.

In some cases, the adenoids can become enlarged or chronically infected, leading to various health issues,¹ such as difficulty breathing through the nose, snoring, sleep apnea, and recurrent ear infections. When these problems become significant, surgical removal of the adenoids, known as an adenoidectomy, may be recommended.²

The procedure is commonly performed in children but can also be necessary in adults who experience similar symptoms due to enlarged adenoids.

Surgical techniques for adenoidectomy

Curettage adenoidectomy

Overview: The traditional and most widely used technique. It involves the use of a curette, a sharp-edged instrument, to scrape and remove the adenoid tissue.

Procedure: Under general anesthesia, the surgeon inserts a curette through the mouth into the nasopharynx and manually excises the adenoids. The excised tissue is then removed from the nasopharynx.

Advantages: Simple and effective for removing large amounts of adenoid tissue.

Disadvantages: May leave behind residual tissue,³ which can regrow. There is also a risk of bleeding and trauma to surrounding structures.

Electrocautery adenoidectomy

Overview: Uses electrical energy to remove adenoid tissue and simultaneously cauterize blood vessels to minimize bleeding.

Procedure: A probe emitting electrical currents is used to cut and coagulate the adenoid tissue.

Advantages: Reduced intraoperative bleeding due to cauterization.

Disadvantages: Potential for thermal damage to surrounding tissues, leading to a longer recovery time and more postoperative pain.

Coblation adenoidectomy⁴

Overview: A newer technique that uses radiofrequency energy combined with a saline solution to create a plasma field, which dissolves adenoid tissue at low temperatures.

Procedure: A specialized probe is inserted into the nasopharynx to remove the adenoid tissue with minimal damage to surrounding tissues.

Advantages: Minimal bleeding, reduced postoperative pain, and quicker recovery. The technique is highly precise, reducing the risk of injury to nearby structures.

Disadvantages: Higher cost due to specialized equipment, and the need for specific training to perform the procedure.

Endoscopic-assisted adenoidectomy

Overview: Involves the use of an endoscope for better visualization of the adenoid tissue and surrounding structures.⁵

Procedure: An endoscope is inserted through the nose or mouth, providing a clear view of the adenoids. The surgeon then removes the tissue using either curettage, electrocautery, or coblation.

Advantages: Enhanced visualization allows for more complete removal of adenoid tissue and less risk of leaving residual tissue.

Disadvantages: Requires additional equipment and expertise, potentially increasing the cost and duration of surgery.

Complications of adenoidectomy

Bleeding: The most common complication, though it is usually mild and easily controlled during surgery. Rarely, significant postoperative bleeding can occur, requiring further intervention. **Infection:** Postoperative infections are rare but can occur, potentially leading to fever, pain, and swelling. These are usually managed with antibiotics.

Velopharyngeal Insufficiency (VPI): This occurs when the soft palate fails to close properly against the back of the throat, leading to nasal-sounding speech and difficulty with certain sounds. It is more likely in patients with pre-existing anatomical conditions. **Residual or Recurrent Adenoid Tissue:** Incomplete removal of adenoid tissue can lead to regrowth and the return of symptoms, possibly necessitating

repeat surgery. Damage to Surrounding Structures: The proximity of the adenoids to the Eustachian tubes and other critical structures in the nasopharynx means there is a risk of unintentional damage during surgery. This can lead to complications such as Eustachian tube dysfunction and middle ear issues.

Anesthesia-related Risks: As with any surgery requiring general anesthesia, there are inherent risks, including allergic reactions, respiratory issues, and cardiovascular complications. These risks are generally low, especially in otherwise healthy patients. Postoperative Pain and Swelling: Most patients experience some degree of pain and swelling after the procedure, which typically resolves within a few days. Pain management strategies are often employed to minimize discomfort.

Various types of the adenoid curettes (Figure 1, 2, 3)



Figure 1 St. Clair-Thomson.



Figure 2 Negus.

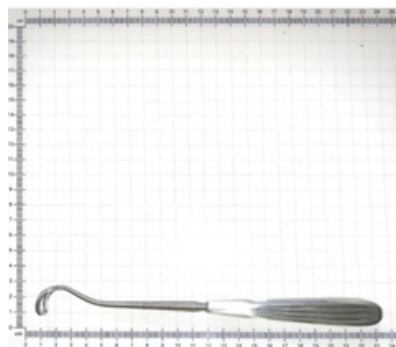


Figure 3 Konig-Stubbs.

Necessity of thinking a new design

All the existing curettes do not have the flexibility of ensnaring the Adenoids as a whole in one go because the cutting portion is fixed. We present here a concept of a novel technique which should be able to remove the adenoids in totality with less bleeding because of sharp dissection and also right till its perimysium fascial layer as the material used is unbreakable thread which should align to the nasopharyngeal bed curvature by kept pressing on the posterior nasopharyngeal wall while shaving in a curvilinear motion.

Physical basis

In the absence of a well-defined plane, the difference in consistency of the Adenoids from its bed should allow a sharp dissection with this novel technique.

Materials and methods

Patient Positioning and Anesthesia: The patient under general anesthesia in a propped-up position to allow optimal access to the nasopharynx. Visualization: An assistant shows the adenoids on monitor using nasal camera endoscopy, providing a clear view for the procedure.

Instrument Preparation: A 2-0 Prolene thread (unbreakable but thin enough to cut through the adenoid and perimysium plane without damaging the Fascial layer) is prepared and passed through the rings of two independent instruments and brought out through the lumen of the instrument out of the thumb rest. The instruments are individually introduced into the nasopharynx through the mouth (Figure 4 & 5).

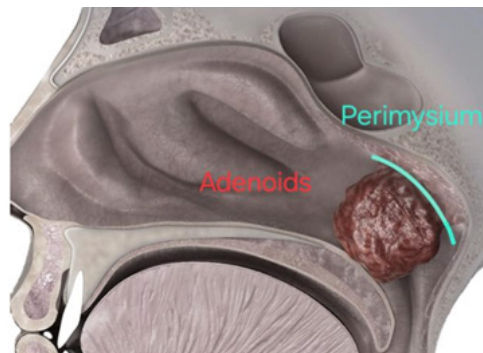


Figure 4 Adenoids location.

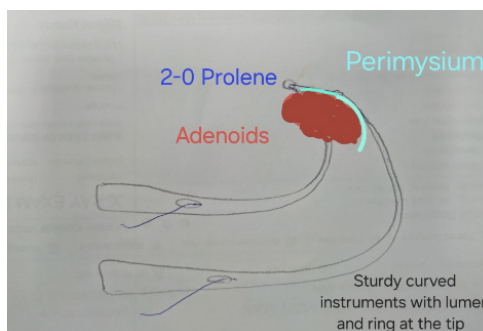


Figure 5 Diagrammatic representation of our technique.

Adenoid Ensnaring: The thread is garlanded around one side of the adenoids, with one end of the thread being held on the instrument handle. The same process is repeated on the other side of the adenoids using the second instrument. Thread Tensioning: The thread is made taut by firmly holding one end and pulling the other end.

The assembly is then pulled in a curvilinear motion while pressing against the back wall of the nasopharynx. This technique is expected to remove the adenoid tissue flush to the fascia layer as sharp shearing force is applied by the unbreakable thread. The resulting bleed can be controlled with gauze piece adenoid pack pressure soaked in dilute adrenalin leaving for a few minutes in nasopharynx.

Comparison to Traditional Methods: This novel technique is expected to remove the entire adenoid mass in one go with minimal bleeding, making it a quicker, cheaper, and less tissue-residual alternative to the conventional curettage with various other Adenoid curettes because here we are using two separate arms to completely ensnare the adenoids one by one under vision. If it works out, it will be a cost effective, less time consuming with much shorter learning curve than compared to Coblation Adenoidectomy. As it is a concept pending any clinical trial, the practicality of the expected results are not known. Only if it is attempted with patient's consent and institution's permission, will the results, efficacy and complications will be known.

Discussion and conclusion

The author has attempted to conceptualize if a relatively less traumatic and yet complete Adenoidectomy be done by this technique. This technique is worth a try if it works, there would be lot of advantages as enumerated above.

Acknowledgments

None.

Conflicts of interest

The author declares that there is no conflict of interest to disclose.

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