ENDOSCOPIC-ASSISTED ADENOIDECTOMY USING COBLATION. IS IT THE GOLD STANDARD?

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Abstract

Adenoidectomy is one of the most common procedures, especially in the pediatric population. When accurately performed, it can cause significant changes in the quality of life of the patient, with minimum risks. Today, the surgeon has a large variety of surgical technologies available for this intervention, from the classical cold steel technique to the state of the art advancements, such as radiofrequency or coblation. The aim of this paper is to evaluate the advantages that are provided by coblation adenoidectomy, taking into account the duration of the intervention, the safety and efficacy of the procedure and the postoperative pain. We consider all of these factors to be important, especially considering the difficult choice the surgeon faces in choosing the best technology for each patient.

Keywords: coblation surgery, adenoidectomy, risk management

Introduction

The adenoids represent lymphatic tissue that forms part of the Waldeyer's ring, along with the palatine tonsils and the lingual tonsil. Their function in the immune system decreases with age, so by the time a person reaches maturity they are considered vestigial. However, it is not recommended to perform an adenoidectomy in children under one year.

The adenoids suffer a growth process until the child reaches about 4 years of age. From this point, the development of the nasopharynx will cause a decrease in the relative proportion of the adenoids, causing the symptoms to diminish.

The right moment for the surgical intervention of adenoidectomy and if the procedure is absolutely necessary are two aspects that are quite difficult to assess. Patients suffering from obstructive sleep apnea, especially children, represent a large portion of people undergoing adenoidectomy [1]. Patients suffering from chronic otitis media that does not respond to medication represent another category where the adenoidectomy is indicated [2], especially when trying to avoid the long term use of tympanostomy tubes. Whether or not to perform an adenoidectomy in people with recurrent upper respiratory pathway infections is still a controversial matter, some considering watchful waiting to be a good approach [3].

Children may suffer from snoring and obstructed nasal breathing during the first childhood, but these symptoms will most often regress after the age of 5.

Considering the relation between the hypertrophic adenoids and the vomer, soft palate and torus tubaris, a grading system has been designed [6]:

Grade	Anatomical structures that come into contact with the adenoids
I	None
II	Torus tubaris
III	Torus tubaris, vomer
IV	Torus tubaris, vomer, the soft palate at rest

Table 1. The grading systems of hypertrophic adenoids.

If needed, the surgical intervention of choice is adenoidectomy, consisting in the complete removal of the adenoids. Considered today a routine surgery, it was first performed by Meyer in 1867. As with all surgical interventions, complications may occur, but fortunately these are considered to be rare [4]. These include bleeding, post operative dehydration [5], accidental lesions of the torus tubaris, incomplete removal, these being the most often.

A large choice of surgical technologies are available. From the use of cold instruments to stripping under endoscopic control, the use of bipolar coagulation, microdebrider or coblation, all these methods have the purpose of increasing the efficacy and diminishing the risks [7, 8]. Studies have shown that the use of coblation for adenoidectomy is associated with less intraoperative bleeding and less postoperative pain [9].

Material and methods

The coblation technique was designed by the ArthroCare Corporation. The process involved refers to the formation of a precisely focused plasma field thru which the ions are excited in a saline environment and the connections between molecules are broken, leading to the dissociation of soft tissues. The process takes place at relatively low temperatures, between 40 and 70 degrees Celsius, especially when comparing to other conventional electrosurgical devices,

where the temperature can go as high as 600 degrees Celsius. The main advantages of the coblation devices are represented by minimal thermal penetration and gentle removal or dissolution of the target tissue, with minimal effects on the surrounding areas, whereas conventional electrosurgical devices are associated with a deep thermal penetration and rapid heating, charring or burning. The device can provide hemostasis in the same time.

We performed our study on a group of 30 patients that underwent coblation adenoidectomy. Both pediatric and adult patients were included in the study and an informed consent was obtained before each procedure.

The exclusion criteria consisted of existing bleeding disorders, patients that associated more than one intervention or the presence of significant medical history.

All interventions were performed under general anesthesia, with orotracheal intubation. This increased the comfort of the patient and allowed the surgeon to better perform the surgery, having a clean surgical field and a relaxed patient.

A mouth gag was mounted and the soft palate was anchored by 2 Nelaton probes.

Figure 1 - Exposure of the adenoids pack under endoscopic control – intraoperative image

The adenoids were removed with the coblation wand under the endoscopic control performed with a 70 degrees rigid scope transorally.

Another option is the use of a 0 degrees rigid scope transnasally, but we prefer the first option, as it allows a complete view of the nasopharynx and so it was possible to remove the entire pack

of adenoids, even when in proximity of the torus tubaris.

Figure 2 - Removal of the adenoids with the coblation wand – intraoperative aspect

Figure 3 - Endoscopic control with a 70 degrees rigid scope – complete view of the rhinopharynx

Figure 4 - Intraoperative aspect – almost complete removal of the adenoids with minimum bleeding

All surgeries were performed with a one-day commitment to the clinic, allowing the patient to go home after a few hours from intervention. The treatment included antibiotics and NSAID, plus the local treatment using saline solutions and oil.

The surgeries were performed by a single surgeon in this study, so difference in experience cannot be an error factor.

All patients were assessed, considering the intraoperative bleeding, the risk of dehydration and the postoperative pain.

Results

All patients were discharged from the clinic the same day as the intervention, with controls in the days 3, 7 and 14 after surgery. The adherence was very good, all patients attending their controls. When asked to quantify the amount of pain experienced, most patients described it as minimum, being able to resume their normal activities the day after surgery. Also, the normal intake of fluids and food was possible within 24 hours from the intervention.

The intraoperative bleeding was practically nonexistent, due to the modern technology of coblation, that provided instant hemostasis, especially when compared to the cold steel technique. We had no cases of postoperative bleeding.

Another very important advantage was the ability to eliminate the entire pack of adenoids, due both to the endoscopic control performed with the 70 degrees rigid scope and to the fact that the small tip of the coblation wand can reach all areas of the rhinopharynx.

Figure 5 - Postablative aspect of the rhinopharynx

This allowed to access areas in the proximity of the torus tubaris, that with conventional methods would have involved the risk of lesions of the torus.

Also, due to the low thermal effect and minimum damage to the surrounding tissues that are specific for coblation, the local inflammatory response was diminished, translating into less pain for the patient.

The only disadvantages of this technique that we observed were the increased time of surgery and the need for trained personnel. The surgeon performing the intervention must be trained and have the proper experience of working with coblation, and the clinic where the interventions are performed must have the adequate equipment. Also, the intervention itself, even in the hands of an experienced surgeon, has a duration significantly longer when compared to the cold steel technique.

Conclusions

We consider the coblation technology to be an important advancement in the surgery of the adenoids. Although considered a basic, routine surgery, it can associate discomfort due to the postoperative pain and recurrence, if the entire pack of adenoids is not completely removed. Due to the fact that it associates less bleeding, a diminished degree of pain and the possibility to vaporize the entire adenoidal tissue, with minimum damage to the surrounding tissues, we consider coblation adenoidectomy a viable and improved option, which should be considered whenever available.

The coblation wand is malleable, and provides the surgeon with the ability to access hidden area under endoscopic control. The low temperature associated with coblation will result in a better healing of the tissue. The endoscopic view is clear due to the coblation's coagulation

properties. It seems that for the time being is the best tool to perform endoscopic adenoidectomy. Acknowledgement: All authors have contributed equally to this paper.

References

1. Brietzke SE, Gallagher D. "The effectiveness of tonsillectomy and adenoidectomy in the treatment of pediatric obstructive sleep apnea/hypopnea syndrome: a meta-analysis". *Otolaryngol Head Neck Surg*, 2006, 134 (6): 979–84.
2. Paradise JL, Bluestone CD, Rogers KD, et al. "Efficacy of adenoidectomy for recurrent otitis media in children previously treated with tympanostomy-tube placement. Results of parallel randomized and nonrandomized trials". *JAMA* 1990, 263 (15): 2066–73.
3. Van den Aardweg MT, Boonacker CW, Rovers MM, Hoes AW, Schilder AG. "Effectiveness of adenoidectomy in children with recurrent upper respiratory tract infections: open randomised controlled trial". *BMJ* 2011, 343: d5154.
4. Regmi D, Mathur NN, Bhattarai M. Rigid endoscopic evaluation of conventional curettage adenoidectomy. *J Laryngol Otol* 2011;125:53-8.
5. Gallagher TQ, Wilcox L, McGuire E, et al. Analyzing factors associated with major complications after adenotonsillectomy in 4776 patients: comparing three tonsillectomy techniques. *Otolaryngol Head Neck Surg*.2010;142:886–892.
6. Sanjay R. Parikh, MD, Mark Coronel, MD, James J. Lee, MD, and Seth M. Brown, MD. Validation of a new grading system for endoscopic examination of adenoid hypertrophy *Otolaryngology–Head and Neck Surgery*, 2006, 135, 684-687.
7. Timms MS, Ghosh S, Roper A. Adenoidectomy with the coblator: a logical extension of radiofrequency tonsillectomy. *J Laryngol Otol*. 2005;119:398–399.
8. Krajewski M, Samoliaski B, Schmidt J. Endoscopic adenotomy – clinical assessment of value and safety – an own experience. *Otolaryngol Pol*. 2007;61:21–24.
9. Thiagarajan B, Nair VB. Coblation adenoidectomy our experience. *Online J Otolaryngol*. 2014; 4(Supplement 1): 38-43.