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The benefits of endoscopic look after curettage adenoidectomy

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Abstract

Background: Conventional curettage adenoidectomy (CCA) has a risk of incomplete removal of all adenoid tissue, and digital nasopharyngeal palpation is not enough to assess adenoid removal. The aim of this study was to evaluate the benefits of trans-oral endoscopic look of the nasopharynx (ELN) after CCA.

Results: This prospective study included 1900 children with adenoid hypertrophy. CCA was used for treatment, followed by ELN. Bleeding points and/or adenoid tissue remnants were recorded and managed. One year postoperatively, nasal endoscopy was performed to detect adenoid regrowth. ELN showed bleeding points in 17 patients (0.9%) and residual adenoid tissue remnants in 855 patients (45%). Intraoperatively, the lesions were cauterized and ablated under visualization. However, adenoid regrowths were detected in 263 (42%) out of 627 children (33%) who were subjected to endoscopic examination after 1 year of adenoid removal.

Conclusions: Trans-oral endoscopic look of the nasopharynx after CCA is a beneficial method in detection of adenoid remnants and bleeding points. Also, it could decrease symptomatic adenoid regrowth postoperatively.

Keywords: Adenoid, Adenoidectomy, Curettage adenoidectomy, Adenoid recurrence, Trans-oral endoscopy, Postoperative bleeding

Background

Adenoidectomy with or without tonsillectomy is a common pediatric surgical procedure. Adenoid hypertrophy causing snoring, mouth breathing, nasal discharge, sleep apnea, otitis media with effusion, and/or hyponasal speech is the definite indication for the procedure [1]. The operation is usually successful in relieving the symptoms; however, recurrence and even persistence of such symptoms may be encountered in some patients [2]. Many risk factors have been implicated as causes of adenoid regrowth such as young age, allergic rhinitis, gastroesophageal reflux, and incomplete removal of the adenoidal tissue that may have indistinct border [2, 3].

Indeed, several techniques for adenoidectomy have been described in the literature; curettage method is a simple and quick procedure that has already been in use for a long time, but this technique carries a high risk of recurrence unless done under direct or indirect vision [4].

Although, post-adenoidectomy bleeding is rare, it is a challenging serious event and may require placement of a posterior nasopharyngeal pack with subsequent hospital admission [5]. The bleeding is usually related to adenoid remnants that could be missed during blind adenoidectomy [6]. Also, blind removal of the adenoid tissue may carry the risk of Eustachian tube injury that could be caused by application of curette on the tubal orifice [7, 8]. As our institutional method for adenoid removal is the conventional curettage adenoidectomy (CCA) technique, we aimed in this study to evaluate the benefits of trans-oral endoscopic look of the nasopharynx at the end of the procedure.

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This study was conducted as a prospective study on the Department of Otolaryngology of Cairo University (Egypt). It was conducted in the period from February 2013 to March 2019.

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Methods

One thousand and nine hundred children scheduled for adenoidectomy either alone or associated with tonsillectomy were enrolled in this prospective study. Their ages ranged between 3 and 15 years (with a mean of 4.92 ± 1.4), 1120 males and 780 females. The study was carried out in a tertiary referral center in the period from February 2013 to March 2019. The principles outlined in the Declaration of Helsinki were followed, and informed consents were obtained from the parents of the patients. In addition, the research protocol was approved by the Research Ethics Committee of our institute.

All patients were subjected to the following:

- *Preoperative evaluation*

Otolaryngologic examination was performed for detection of other associated lesions. Particular attention was paid for nasal and pharyngeal examination to detect any obstructive lesion other than adenotonsillar hypertrophy. Patients who had nasal pathology such as allergic rhinitis, deviated septum, or any other obstructive lesion were excluded. Nasal endoscopy was performed for all patients using a 0° Hopkins 2.7-mm nasal endoscope, while lateral neck radiography for the nasopharyngeal air column was performed for none cooperative children. Ear examination was done routinely for patients with adenoid hypertrophy.

- *Operative procedure*

With the patient in supine position, general anesthesia was delivered through oral endotracheal intubation. A Boyle-Davis mouth gag was used to open the mouth. Patients underwent CCA using adenoid curette. After adenoid removal, we confirmed clearance of the nasopharynx by digital palpation and we inserted a nasopharyngeal pack for 5 min as a routine policy of our institute. Conventional dissection tonsillectomy with cold instruments was performed for patients scheduled for tonsillectomy. After removal of the nasopharyngeal pack, we retracted the soft palate using two rubber catheters passed from the nose to the mouth. Trans-oral endoscopic examination of the nasopharynx was performed, using a 70° Hopkins 4-mm nasal endoscope. The endoscope was passed through the mouth to explore the adenoid bed. The endoscope was connected to a camera (Karl Storz GmbH & Co KG; Tuttlingen, Germany), and the view was displayed on a monitor. Residual adenoid tissue remnants were detected and ablated; also, any bleeding point was cauterized. We achieved the procedure with a bipolar diathermy with curved blades and a suction tip under complete visualization, and then the catheters were removed. Myringotomy and insertion of ventilation tubes were

performed for patients with middle ear effusion. The patients were awakened and extubated. Patients were placed in the lateral position and transferred to the post-anesthesia recovery room.

- *Postoperative assessment*

Routine postoperative treatment was given for the patients. Any nasal and/or oral bleeding was recorded, and the parents were instructed to come to the emergency room immediately on occurrence of bleeding. Patients were discharged from hospital in the same operative day. Children were seen at the end of the first and second postoperative weeks for assessment of wound healing. Patients were instructed to return on appearance of any nasal obstructive symptoms other than flu; otherwise, they were asked to return 1 year postoperatively for re-evaluation. We performed nasopharyngeal examination using nasal endoscope 0° Hopkins 2.7 mm during the re-evaluation. Non-cooperative children needed sedation using IV midazolam in a dose of 0.1 mg/kg over a 5-min period just before endoscopy.

Results

This prospective study was conducted on 1900 children with adenoid hypertrophy. CCA was performed for all patients; in addition, tonsils were removed for 1105 of them. Intraoperative trans-oral endoscopic examination of the adenoid bed was performed for all patients after removal of the usual nasopharyngeal pack. Bleeding points were detected in 17 patients (0.9%). The source of bleeding was seen in the lower border of the adenoid bed between the denuded raw area and the grazed mucosa of the posterior pharyngeal wall in 6 patients, in the central deep part of the adenoid bed in 4 patients, in the lateral parts of the adenoid bed on either side in 3 and on both sides in 2 patients, and in the anterior nasopharyngeal part near the choanae in 2 patients. Cauterization of the bleeding points using a bipolar diathermy with curved blades and a suction tip was performed under complete visualization. Residual adenoid tissue remnants were detected in 855 patients (45%). The remnants were located near the choanae in 418 patients; unilateral in 322 and bilateral in 96, in the peritubal area in 237 patients; unilateral in 211 and bilateral in 26, in the posterosuperior nasopharyngeal wall in 93 patients, inside one choana in 57 patients and both choanae in 25 patients, in the peritubal area and posterosuperior nasopharyngeal wall in 14 patients, and in the peritubal area and inside one choana in 11 patients. These residual adenoid tissue remnants were ablated by the bipolar diathermy under visualization with great care to avoid touching the Eustachian tube orifice. Myringotomy and insertion of ventilation tubes were performed for 322

patients. We encountered no intra- or postoperative complications.

One year postoperatively, 627 patients (33%) returned for re-evaluation. Parental questionnaire showed no nasal obstruction or even mouth breathing other than at the time of common cold. Nasal endoscopy for those children showed adenoid regrowth in 263 (42%). However, the lesions were small, and they were located in the peritubal area in 187 patients; unilateral in 109 and bilateral in 78, in the posterosuperior nasopharyngeal wall in 32 patients, and in both areas in 44 patients. Those lesions were asymptomatic and needed no treatment (Table 1).

Discussion

Conventional curettage adenoidectomy was first described in 1885, and since then, it has been considered the most commonly used technique for adenoid removal [9]. It has the shortest surgical time when compared with the recent adenoidectomy techniques; also, there are no significant complications between different procedures [10]. The technique is still widely performed; however, recent studies showed difficult removal of all adenoid tissue as the nasopharynx is usually not appropriately visualized during the procedure [4, 11]. In endoscopic era, one can clearly visualize the nasopharynx and completely remove any adenoid tissue remnant. Also, bleeding that may be encountered after adenoidectomy could be controlled under direct endoscopic visualization with avoidance of prolonged nasopharyngeal packing [7].

In this study, 1900 children underwent adenoidectomy with or without tonsillectomy. The technique used for adenoid removal was the CCA which is the routine method of our institute. At the end of the procedure, we examined the nasopharynx endoscopically through the mouth after retraction of the soft palate. Bleeding points were detected in 17 patients (0.9%); they were cauterized by a bipolar diathermy with curved blades. Residual adenoid tissue remnants were detected in 855 patients (45%); they were located near the choanae and in the peritubal areas in most patients. All residuals were ablated under endoscopic vision. One year postoperatively, we examined 627 children with nasal endoscope. We found adenoid regrowths which were small and asymptomatic in 263 patients (42%). Those tiny lesions were located either in the peritubal areas (71%), in the

posterosuperior nasopharyngeal wall (12%), or in both areas (17%).

Elhassan et al. [12] reported that blind curettage adenoidectomy has a risk of inadequate removal of all adenoid tissue in up to 80% of patients, and digital nasopharyngeal palpation does not adequately assess adenoid removal. However, their patients who underwent endoscopic examination at the end of the procedure had a 0.85% revision adenoidectomy rate over a 2-year period, this means that most residuals were small and not threatening the airway. Even Ark et al. [11] who examined the nasopharynx with a postnasal mirror after CCA, they found no residual remnants in only 20.2% of their patients, so they concluded that digital palpation is not a dependable method for ensuring complete removal of all adenoid tissue. Elnashar et al. [13] performed trans-nasal endoscopic examination of their patients who underwent CCA; they detected residual adenoid tissue remnants in 95.45%. While Bross-Soriano et al. [14] visualized the nasopharynx with a postnasal mirror during CCA, the indirect vision was not enough to remove the adenoid totally in 70.3% of the patients who had residual adenoid tissue remnants seen by endoscopic examination. However, some authors found a lower rate of residual adenoid tissue after CCA; Havas and Lowinger [15] detected residual remnants that were large and obstructive in 39% of their patients. Also, Yaman et al. [16] examined the nasopharynx endoscopically at the end of CCA, and they detected residuals in 32% of their patients. The wide range of variability incidence of missed adenoid tissue after CCA may be related to the surgeons' experience and the method of visualizing the nasopharynx either indirect by a mirror or direct by the endoscope that may be introduced through the nose or through the mouth.

Despite endoscopic examination of the nasopharynx after curettage adenoidectomy with removal of all adenoid tissue remnants, adenoid regrowth can occur. Lesinskas and Martynas [17] detected adenoid tissue regrowth in 19% of their patients; however, they reported that those regrowths were small and not manifest clinically. However, Buchinsky et al. [18] reported that adenoid rarely regrow enough to cause obstructive symptoms especially if adenoidectomy was performed under visualization. Several studies investigated the problem of adenoid regrowth requiring revision surgery and they showed a frequency range of 0.8 to 1.5% revision after primary adenoidectomy [2, 19–21]. Bhandari et al. [22] reported that the most common indication for revision adenoidectomy is Eustachian tube dysfunction rather than nasal obstruction caused by adenoid regrowth. This may be explained by most residual adenoid tissue remnants are usually cited in the peritubal area as shown in our study.

Table 1 Postoperative findings after curettage adenoidectomy

	Frequency/total	Percentage
Residual adenoid tissue remnants	855/1900	45%
Bleeding points	17/1900	0.9%
Asymptomatic adenoid regrowth	263/627	42%

Endoscopic examination of the nasopharynx after CCA could detect any bleeding point that can be dealt with by electrocautery under visualization. However, if bleeding is encountered after adenoidectomy, the surgeon may opt between packing of the nasopharynx and cauterization of the adenoid bed with diathermy [7, 23]. In this study, we used a bipolar diathermy with curved blades to control post-adenoidectomy bleeding in 17 patients. The method was achievable, and we did not need nasopharyngeal packing in any patient. Demirbilek et al. [23] reported that residual adenoid tissue remnants are usually the commonest source for postoperative bleeding, and nasopharyngeal packing is not an ideal solution for the problem. So, endoscopic examination and ablation of the bleeding tissue may be a more appropriate technique.

It is worth mentioning that we used endoscopic examination at the end of CCA rather than endoscopic guided adenoidectomy, as many studies showed preference of our used method over the endoscopic guided method, as the former technique has a shorter operative time than the later [7, 16, 24]. Other studies showed advantages of the endoscopic-guided technique over the conventional technique regarding blood loss and complication [9, 15]. However, there is no general agreement for the best method of adenoid removal. In our study, we tried to amend the conventional curettage technique which is still the standard method in our institute.

Conclusion

Trans-oral endoscopic examination of the nasopharynx at the end of curettage adenoidectomy is a beneficial method as it enables the surgeon to detect any residual adenoid tissue remnant and any bleeding point that can be managed endoscopically under vision. Also, it could decrease symptomatic adenoid regrowth postoperatively.

Supplementary information

Supplementary information accompanies this paper at <https://doi.org/10.1186/s43163-020-00027-z>.

Additional file 1: Video 1 Conventional curettage adenoidectomy and packing of the nasopharynx.

Additional file 2: Video 2 Trans-oral endoscopic examination of the nasopharynx show residual adenoid tissue in the left choana.

Abbreviations

CCA: Conventional curettage adenoidectomy; ELN: Trans-oral endoscopic look of the nasopharynx

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Authors' contributions

MA analyzed and interpreted the patients' data. AN collected the references of the study and revised them after finishing the manuscript. RN organized and tabulated the results. ME captured the patients' videos and follow-up.

OS organized the patients' sheets and was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The data of this study are available at the corresponding author upon request.

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Kasr Alaini Hospital of Cairo University with approval number [N-36-2013]. The parents of the studied children provided written consents.

Consent for publication

Not applicable.

Competing interests

The authors have no conflicts of interest to declare.

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References

- Johnston J, Mahadevan M, Douglas RG (2017) Incidence and factors associated with revision adenoidectomy: a retrospective study. *Int J Pediatr Otorhinolaryngol* 103:125–128
- Dearking AC, Lahr BD, Kuchena A, Orvidas LJ (2012) Factors associated with revision adenoidectomy. *Otolaryngol Head Neck Surg* 146:984–990
- Duval M, Chung JC, Vaccani JP (2013) A case-control study of repeated adenoidectomy in children. *JAMA Otolaryngol Head Neck Surg* 139:32–36
- El-Badrawy A, Abdel-Aziz M (2009) Transoral endoscopic adenoidectomy. *Int J Otolaryngol*. <https://doi.org/10.1155/2009/949315>
- Mathiasen RA, Cruz RM (2004) Prospective, randomized, controlled clinical trial of a novel matrix hemostatic sealant in children undergoing adenoidectomy. *Otolaryngol Head Neck Surg* 131:601–605
- Milošević DN (2012) Postadenoidectomy hemorrhage: a two-year prospective study. *Vojnosanit Pregl* 69:1052–1054
- Abdel-Aziz M (2012) Endoscopic nasopharyngeal exploration at the end of conventional curettage adenoidectomy. *Eur Arch Otorhinolaryngol* 269:1037–1040
- Atilla MH, Kaytez SK, Kesici GG, Baştımur S, Tuncer S (2018) Comparison between curettage adenoidectomy and endoscopic-assisted microdebrider adenoidectomy in terms of Eustachian tube dysfunction. *Braz J Otorhinolaryngol*. <https://doi.org/10.1016/j.bjorl.2018.08.004>
- Yang L, Shan Y, Wang S, Cai C, Zhang H (2016) Endoscopic assisted adenoidectomy versus conventional curettage adenoidectomy: a meta-analysis of randomized controlled trials. *Springer Plus* 5:426. <https://doi.org/10.1186/s40064-016-2072-1>
- Ferreira MS, Mangussi-Gomes J, Ximenes R et al (2018) Comparison of three different adenoidectomy techniques in children - has the conventional technique been surpassed? *Int J Pediatr Otorhinolaryngol* 104:145–149
- Ark N, Kurtaran H, Ugur KS, Yilmaz T, Ozbuduroglu AA, Mutlu C (2010) Comparison of adenoidectomy methods: examining with digital palpation vs. visualizing the placement of the curette. *Int J Pediatr Otorhinolaryngol* 74:649–651
- Elhassan HA, Bozkurt G, Emre IE (2018) Revision adenoidectomy in children: residual vs regrowth? *Eur Arch Otorhinolaryngol* 275:1035
- Elnashar I, El-Anwar MW, Basha WM, Alshawadfy M (2014) Objective assessment of endoscopy assisted adenoidectomy. *Int J Pediatr Otorhinolaryngol* 78:1239–1242
- Bross-Soriano D, Schimelmitz-Idi J, Arrieta-Gomez JR (2004) Endoscopic adenoidectomy; use or abuse of technology? *Cir Cir* 72:15–19
- Havas T, Lowinger D (2002) Obstructive adenoid tissue: an indication for powered-shaver adenoidectomy. *Arch Otolaryngol Head Neck Surg* 128:789–791
- Yaman H, Memis M, Ilhan E (2015) Comparison of transoral/transnasal endoscopic-guided adenoidectomy with endoscopic nasopharyngeal

inspection at the end of curettage adenoidectomy. *Indian J Otolaryngol Head Neck Surg* 67:124–127

17. Lesinskas E, Drigotas M (2009) The incidence of adenoidal regrowth after adenoidectomy and its effect on persistent nasal symptoms. *Eur Arch Otorhinolaryngol* 266:469–473
18. Buchinsky FJ, Lowry MA, Isaacson G (2000) Do adenoids regrow after excision? *Otolaryngol Head Neck Surg* 123:576–581
19. Monroy A, Behar P, Brodsky L (2008) Revision adenoidectomy—a retrospective study. *Int J Pediatr Otorhinolaryngol* 72:565–570
20. Grindle CR, Murray RC, Chennupati SK et al (2011) Incidence of revision adenoidectomy in children. *Laryngoscope* 121:2128–2130
21. Saphavee A, Bhushan B, Penn E, Billings KR (2013) A comparison of revision adenoidectomy rates based on techniques. *Otolaryngol Head Neck Surg* 148:841–846
22. Bhandari N, Don DM, Koempel JA (2018) The incidence of revision adenoidectomy: a comparison of four surgical techniques over a 10-year period. *Ear Nose Throat J* 97:e5–e9
23. Demirbilek N, Evren C, Altun U (2015) Postadenoidectomy hemorrhage: how we do it? *Int J Clin Exp Med* 8:2799–2803
24. Songu M, Altay C, Adibelli ZH (2010) Endoscopic-assisted versus curettage adenoidectomy: a prospective, randomized, double-blind study with objective outcome measures. *Laryngoscope* 120:1895–1899

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