

Endoscopic evaluation of completeness of conventional curettage adenoidectomy: a single-blinded observational study

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Background

Conventional curettage adenoidectomy is a blind procedure, which performed in a confined postnasal space produces surgical challenges. The aim was to examine the completeness of conventional adenoidectomy and compare it with surgeon satisfaction and to identify the need to objectively assess the residual tissue at the end of procedure.

Aim

The primary aim was to objectively assess the residual adenoid mass after curettage adenoidectomy and compare it with surgeon satisfaction using digital palpation.

Settings and design

A prospective single-blinded observational study was conducted at a tertiary care hospital between February 2015 and September 2015.

Patients and methods

A total of 45 cases that underwent conventional curettage adenoidectomy were included in the study. Intraoperative images of the postnasal space were recorded and compared with surgeon satisfaction score by a single-blinded observer.

Statistical analysis

Statistical analysis of interobserver correlation was performed using Cohen's κ statistics using Graphpad Prism, version-6.07 (trial).

Results

The 45 cases had a mean \pm SD age of 8.45 \pm 2.47 years, and female to male ratio was 1.4 : 1. The kappa analysis of surgeon satisfaction in relation to the presence of residual adenoid tissue showed that the strength of agreement was worse than that expected by chance ($\kappa=-0.383$, SE=0.129).

Conclusion

The study showed that surgeon satisfaction via digital palpation alone fails to assess residual adenoid tissue, and we recommend endoscopic visualization of the nasopharynx to assess completeness of adenoidectomy.

Keywords:

adenoid, conventional curettage adenoidectomy, endoscopic evaluation

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Introduction

In our country, adenoidectomy by curettage method is one of the commonly performed surgeries in the pediatric age group. The surgery has its origins in the late 1800s with the pioneering work of Wilhelm Meyer. The conventional adenoidectomy is still being performed using instruments developed around the First World War, and the procedure has remained more or less identical over the years. The curette developed by Sir St Clair Thomson with a unique cage is the prime armamentarium in conventional adenoidectomy [1].

Chronic adenotonsillitis is the most important indication for adenoidectomy which can present as pediatric obstructive sleep apnea, chronic rhinosinusitis, otitis media with effusion, and recurrent otitis media [2]. Conventional curettage adenoidectomy is a blind procedure, which

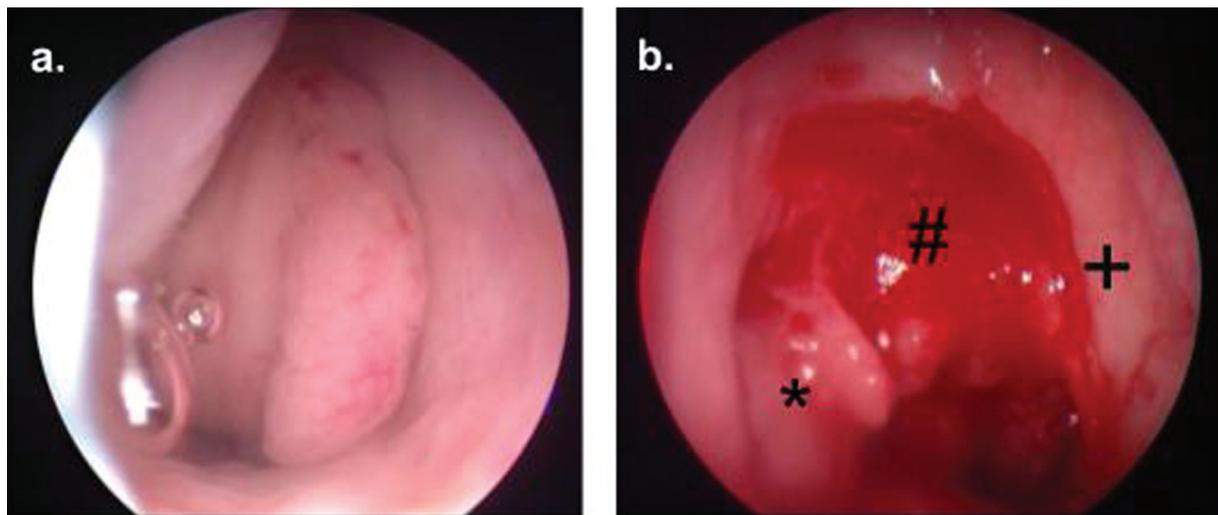
performed in a confined postnasal space produces surgical challenges especially in pediatric population. The purpose of this study was to assess the completeness of conventional adenoidectomy and compare it with surgeon satisfaction, thus, to identify the need to objectively assess the residual tissue at the end of procedure.

Aim

The primary aim was to objectively assess the residual adenoid mass after curettage adenoidectomy and compare it with surgeon satisfaction using digital palpation.

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Figure 1



(a) Preoperative endoscopic image of grade IV adenoid covering torus tubarius and in contact with vomer and soft palate. (b) Shows grade III residual adenoid tissue at the end of the procedure (*torus tubarius, +vomer and #residual adenoid tissue).

Table 1 Adenoid staging system

Grades	Anatomical structures in contact with adenoid tissue
Grade I	None
Grade II	Torus tubarius
Grade III	Torus tubarius and vomer
Grade IV	Torus tubarius, vomer, and soft palate at rest

Anatomic relationship between the adenoid tissue and vomer, soft palate, and torus tubarius (Eustachian tube orifice) by Parikh *et al.* [3].

Patients and methods

A prospective single-blinded observational study was performed in a Tertiary Care Teaching Hospital in Mumbai between February 2015 and September 2015. A total of 45 cases underwent conventional curettage adenoidectomy as a part of their treatment after taking informed consent from parents or guardians. Those who had a history of prior nasal or oral surgery were excluded to eliminate pre-existing surgical variables. Patients unwilling to give consent or assent were also excluded. This study was approved by the institutional ethics committee and was carried out in accordance with the Declaration of Helsinki.

After selection of cases, assessment of postoperative grading of residual adenoid tissue was performed by diagnostic nasal endoscopy with a 4-mm rigid Hopkins endoscope (Karl Storz, Tuttlingen, Germany) (Fig. 1 and Table 1).

The endoscopic images were anonymized, blinded, and saved on cloud storage along with the surgeon satisfaction using digital palpation at the end of the procedure.

Table 2 The demographic details of patients

N	45
Age (mean±SD) (years)	8.45±2.47
Range (years)	3.5–14
Male	19 (42.22%)
Female	26 (57.78%)

The surgeon satisfaction at the end of surgery was based on the presence or absence of residual adenoid tissue palpated in the postnasal space after performing curettage as poor or good satisfaction. All of the intraoperative assessments and surgery were performed by the first author. Grading using endoscopic images was performed by the second author blinded to information. Any residual tissue seen at the end of the procedure was resected by the operating surgeon.

The data were analyzed using Graphpad Prism, version-6.07 (GraphPad Software, San Diego, CA, USA) (trial). Appropriate statistical analysis of interobserver correlation was performed using Cohen’s κ statistics. The significance level of *P* value less than 0.05 was chosen to define statistical significance.

Results

The demographic details of the patients undergoing conventional curettage adenoidectomy are tabulated in Table 2.

By comparing the intraoperative endoscopic grading and digital palpation scores, the degree of correlation of the surgeon satisfaction with residual adenoid tissue was noted (Table 3).

The surgeon satisfaction score was compared with the presence of residual adenoid tissue using κ analysis, and it showed that the strength of agreement is worse than that expected by chance ($\kappa=-0.383$, $SE=0.129$).

In this study, in 77.78% of cases, the surgeons reported good satisfaction at the end of the procedure, and 60% of the cases had grade 2 or more residual adenoid tissue on endoscopic evaluation.

Discussion

The Luschka's tonsil or the adenoid, as it is commonly called, are lymphoid tissue aggregates located in the nasopharynx. The adenoids along with the palatine and lingual tonsils are an integral part of Waldeyer's ring, forming 3–5% of the entire lymphatic system [4]. Conventional curettage adenoidectomy is the most frequently performed surgery in the pediatric patients [5]. Significant adenoid hypertrophy resulting in airway obstruction warrants surgery. Surgery is also indicated in certain disorders like obstructive sleep apnea, otitis media with effusion, chronic otitis media, and chronic rhinosinusitis [6].

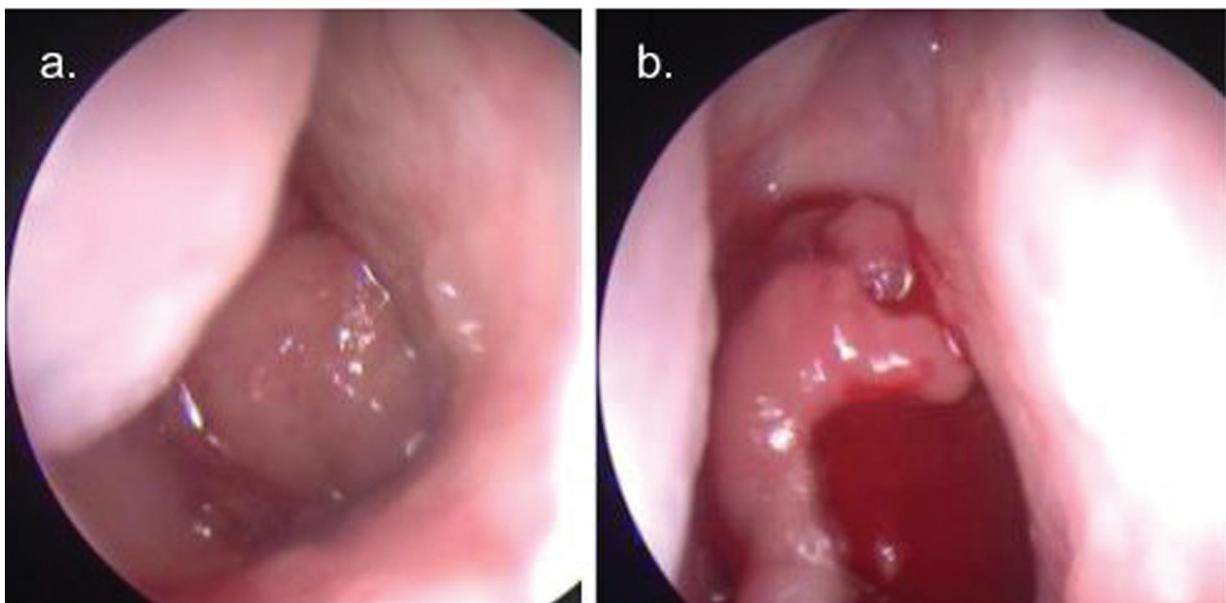
Table 3 Kappa analysis of endoscopic evaluation of residual adenoid tissue and digital palpation

	Residual adenoid	No residual adenoid	Total
Poor satisfaction	8	9	17
Good satisfaction	26	2	28
Total	34	11	45

Adenoidectomy was first performed without any form of anesthesia using a ring knife through the nasal cavity by William Meyer in 1867 [7]. Since then the surgical approach to adenoids has evolved very slowly in terms of surgical methods, instruments, and anesthesia techniques. Modern conventional adenoidectomy has been performed using curettage method using St Clair Thompson's adenoid curette. This method is being performed as a blind procedure with the completeness of the procedure assessed by rubbing a gauze with a finger in the nasopharynx, that is, digital examination. The postsurgical recurrence of adenoids is described in the literature since the very beginning of its surgical excision. Studies evaluating conventional adenoidectomy have proved that the removal of adenoid tissue is often incomplete. Hence, we aimed to study the completeness of conventional adenoidectomy and compare it with surgeon satisfaction score and to highlight the essential need to objectively assess the postoperative residual tissue in the postnasal space.

In this study, 45 patients had an average age of 8.45 years and underwent conventional curettage adenoidectomy at our center. The demographic aspects were unremarkable. This study shows that a significant population ($\geq 60\%$) has significant residual adenoid tissue at the end of the procedure (Figs 1 and 2). The traditional concept of assessing the postnasal space digitally and rubbing a gauze covered finger to achieve completeness of surgery was shown to be highly inefficient.

Figure 2



(a) Preoperative endoscopic image of grade IV adenoid. (b) Grade III residual adenoid tissue at the end of the procedure.

The kappa analysis of residual adenoid tissue seen on postnasal endoscopy to surgeon satisfaction with digital palpation showed that this association was worse than what was expected to be seen by chance ($\kappa=-0.383$). Thus, this study identifies the need to perform postnasal evaluation using either direct or indirect imaging to confirm the complete excision of residual adenoid tissue. Digital palpation is not a reliable indicator of complete clearance of adenoid tissue. In 1900s, Beck advocated that the adenoid recurrence was a result of incomplete, blindly performed adenoidectomy [8]. A study by Ark *et al.* [9] showed that to achieve a complete adenoid tissue removal, a direct or indirect visual assistance is necessary. The authors studied a group of patients who underwent a conventional adenoidectomy in whom surgical efficacy was confirmed by digital palpation at the end of the procedure; subsequently, the nasopharynx was inspected through an indirect laryngeal mirror visualization. Their finding was that only one-fifth of the patients had no residual adenoid tissue. Instead, in the 81% of the patients, a residual lymphatic tissue was still present on the pharyngeal roof near the choanal openings, 11.4% of the patients had a residue along the torus tubarius on either side of the nasopharynx, and in 6.3%, the residual tissue was located at both cited sites.

Traditional surgical teaching emphasizes on wide tissue exposure for identification of surgical landmarks and safe navigation through the surgical field without damage to surrounding tissues. We are of the opinion that this concept applies to even adenoidectomy. The objective evaluation of the postnasal space with an endoscope in the operating theater after curettage should be incorporated as a routine step of the surgery. Any residual tissue should be excised under vision with tools at the disposal of the surgeon. Such endoscopic adenoidectomy was popularized by Canon *et al.*

[10]. It provides better visualization of the surgical field and prevents damage to the surrounding structures.

Conclusion

The study shows that surgeon satisfaction measured by digital palpation fails to assess the presence of residual adenoid tissue, and we recommend that endoscopic visualization of the nasopharynx is essential to confirm the completeness of conventional adenoidectomy. It also showed that conventional curettage adenoidectomy was a safe, well-tolerated procedure with the advantage of being fast and economical.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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