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Objective assessment of endoscopy assisted adenoidectomy

Ismail Elnashar, Mohammad Waheed El-Anwar *, Waleed Mohamed Basha, Mohamed AlShawadfy

Otorhinolaryngology-Head and Neck Surgery Department, Faculty of Medicine, Zagazig University, Egypt

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ABSTRACT

Objectives: To objectively assess the effectiveness of endoscopy assisted adenoidectomy utilizing adenoid tissue volume measurement and to set some parameters for which patients are more legible to this procedure.
Methods: Forty three patients for whom adenoidectomy was conventionally done using adenoid curettes. Surgeon's satisfaction for adenoid removal after curettage and digital palpation was reported. The volume of removed adenoidal tissue was measured. The remaining adenoid tissue, if any, was removed transnasally guided by endoscope. Residual adenoid volume was also was measured. The data was tabulated and statistically analyzed.
Results: The volume of adenoid removed by curettage ranged from 1 to 3.6 ml with a mean of 2.45 ml. The volume of residual adenoid removed by endoscopy after curettage ranged from 0 to 2.9 ml (mean: 0.67 ± 0.58 ml). The volume of residual adenoid after blind curettage was found to have statistically significant relation to older age of patients, preoperative larger adenoid by X-ray and Surgeon's dissatisfaction about the completeness of removal after curettage.
Conclusion: Conventional curettage adenoidectomy misses a substantial volume of adenoid tissue. Endoscopy-assisted adenoidectomy is significantly recommended in children age >10 years, dissatisfied surgeon after curettage and palpation, and grade 3 adenoid enlargement on X-ray.

Introduction

Whether performed alone or combined with tonsillectomy, adenoidectomy is one of the most common surgical operations in pediatric otolaryngological practice [1]. Due to the large number of adenoidectomies performed, surgeons must lay particular attention to the safety, accuracy and outcomes when choosing among different surgical techniques. Since it was first described in 1885 [2], curette adenoidectomy with pack hemostasis is considered the most commonly used surgical technique for adenoidectomy [1]. Despite the trials of indirect visualization with laryngeal mirrors, the conventional technique is more or less a blind procedure. Both Cannon et al. [3] and Havas and Lowinger [4] have drawn attention to the high percentage of residual tissue remaining after traditional adenoidectomy with curette [4], especially in the choanal and tubaric regions [5].

Since 1992, a number of authors have described visualization of the operating field, during surgery, with trans-nasal [6] or trans-oral endoscope [7]. Those authors employed curette, suction-coagulator [5], forceps [8] and transnasal or trans-oral microdebrider [4,9] as surgical tools for the removal of the adenoids. The use of the rigid endoscope has its advantages. It allows good visualization ensuring complete removal of adenoid tissue situated even high up in nasopharynx and intranasally without damaging surrounding structures. When used transnasally there is no need to extend the neck especially in patients with instability of the cervical spine [4]. If partial adenoidectomy is appropriate, it is also possible to perform very selective removal of the adenoid tissue [1].

Despite the many advantages described by many authors for the use of the endoscopic technique, there are only few studies which objectively proved the effectiveness of this technique over the traditional one. These studies also did not provide sufficient data to abandon the traditional technique and make the endoscopic technique the standard of care.

In this work, the authors tried to objectively prove the effectiveness of the endoscopic technique, by measuring the volume of residual adenoid tissue removed through endoscopy

* Corresponding author. Tel.: +20 1004695197; fax: +20 552307830.
E-mail address: mwenteg@yahoo.com (M.W. El-Anwar).

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Fig. 1. Intraoperative endoscopic view of right nasal cavity of with completely obstructing residual adenoid tissue after curettage (before endoscopic removal).

after finishing the traditional curettage and comparing this with the volume of the whole adenoidal tissue removed; and in this way trying to set some parameters for which cases are more likely to require same setting endoscopic intervention after traditional cold curettage.

Patients and methods

The study included 43 patients for whom endoscopy assisted adenoidectomy was performed in the period from November 2010 to 2013. This study was approved by the Ethics Review Committee at Zagazig University Hospital and informed written consent was obtained from the parents of the enrolled subjects. All patients were subjected to full history taking, clinical examination, laboratory testing and radiological examination including plain X-ray nasopharynx and/or CT. The radiological findings were recorded then interpreted based on Cohen method [1]. All patients had medium (grade 2)–large (grade 3) adenoids. Patients with small adenoid enlargement were not included in the study. Children with cleft palate were also excluded. The surgeries were performed by well experienced surgeons who performed at least five hundred adenotosillectomies and works as consultant at Zagazig University Hospital (tertiary care hospital). Topical nasal decongestion (oxymetazoline spray) was used preoperatively. All surgeries were done under general anaethesia with oral endotracheal intubation. Adenoidectomy was done using sharp adenoid curettes in the conventional way and the surgeon was allowed to palpate the adenoid bed and repeat the curettage to assure complete removal.

Surgeon's satisfaction for complete adenoid removal after curettage and digital palpation was reported as satisfied (surgeon could not feel any residual adenoid tissue by digital palpation of nasopharynx and posterior choanae) or dissatisfied (surgeon felt residual adenoid tissue but could not be reached and excised by curettage).

The volume of the excised adenoid was measured by putting it in a graded measuring tube containing 5 ml saline after removal of all blood clots and any moisture. The increase in saline volume above 5 ml was calculated and represented the removed adenoid tissue volume. This measure was revised independently by two of the authors at least. Similar method was used by Yilmaz et al. 2008 [10] but we preferred to use a graded measuring tube instead of the syringe to allow placing the tube vertically to read and measure it accurately and avoid the possibility of fluid escape around the finger closing the syringe tip.

The mouth gag was disarticulated and the patient was placed in endoscopic sinus surgery position. The remaining adenoid tissue, if any, was removed transnasally under endoscopic guidance using straight and curved forceps until the adenoid was removed completely (Figs. 1 and 2). If there was any bleeding, suction cautery was used to stop it.

The part removed through the endoscope was put in another measuring tube and its volume was separately measured. The results of the study were statistically analyzed using a *t*-test (Tables 2 and 3).

Results

The study included 28 (65.1%) males and 15 (34.9%) females. Their ages ranged from 1 year and 6 months to 17 years with a mean age of 8 years and 3 months. The surgery was performed alone in 23 (53.5%) patients including 4 recurrent (9.3%) patients and as part of other surgery in 20 (46.5%) patients including 9 with tonsillectomy, 8 with ventilation tube insertion and 3 with FESS. The volume of adenoid removed by curettage ranged from 1 to 3.6 ml with a mean (±SD) of 2.46 ml (±0.62). The volume of residual adenoid removed by endoscopy after curettage ranged from 0 to 2.9 ml with a mean (±SD) of 0.67 ml (±0.58) (Table 1). The mean percent of part endoscopically removed was 21.5% of total adenoid size. Preoperative radiology showed medium (grade 2) adenoid in 13 (30.2%) and large (grade 3) in 30 (69.8%) cases. For patients with grade 2 adenoid enlargement, the volume of adenoid removed by endoscopy after curettage ranged from 0 to 1.1 ml (mean ± SD was 0.42 ± 0.25 ml). For large (grade 3) adenoid, the volume of adenoid removed by endoscopy after curettage ranged from 0 to 2.9 ml (mean ± SD was 0.78 ± 0.66 ml) (Table 2). For the 22 patients (51.2%) in whom the surgeon was satisfied after adenoid removal by curettage, the size of adenoid removed by endoscopy after curettage ranged from 0 to 0.6 ml (mean ± SD was 0.33 ± 0.16 ml). For the 21 (48.8%) unsatisfactory adenoid removal by curettage, the volume of adenoid removed by endoscopy after curettage ranged from 0.3 to 2.9 ml (mean ± SD was 1 ± 0.67 ml) (Table 2). The mean percent of part endoscopically removed was 21.5% of total adenoid size. According to age, patients aged 10 years or more had more residual adenoid volume after curettage that was detected and removed endoscopically than children aged less than 10 years and the difference was statistically significant (T; 4.2066 and P value; <0.0001) (Table 3).

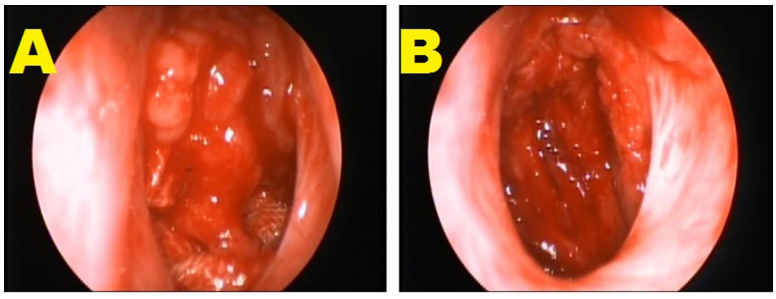

Fig. 2. (A) Intraoperative endoscopic view of left nasal cavity with partially obstructing residual adenoid tissue after curettage. (B) Intraoperative endoscopic view of the same patient after endoscopic removal of the residual adenoidal tissue.