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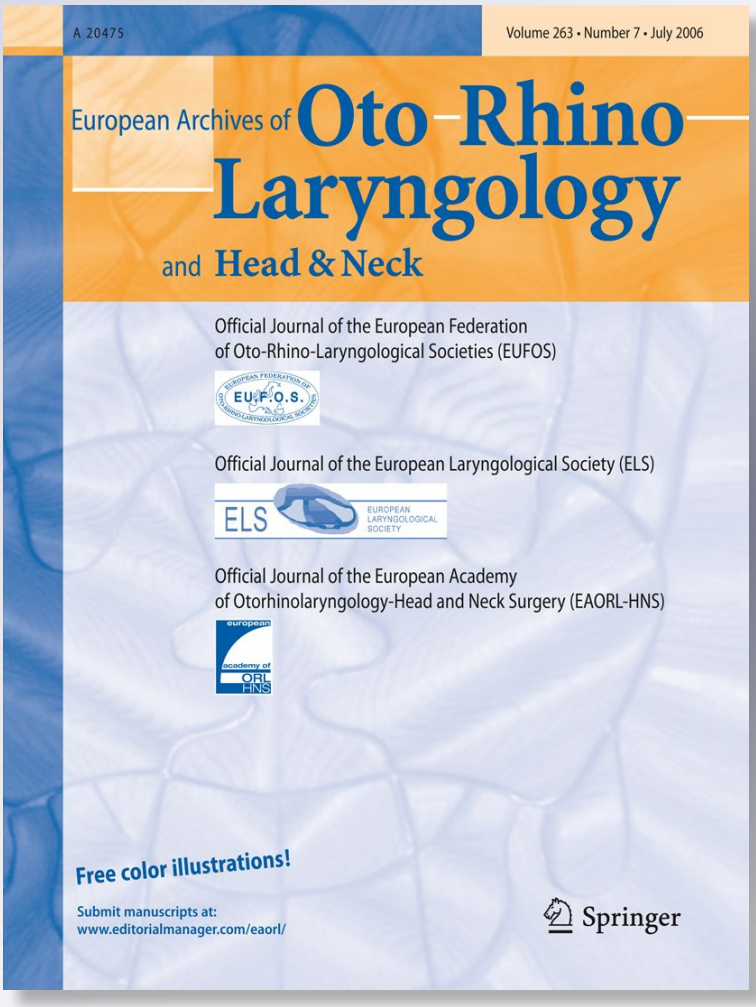

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MISCELLANEOUS

Endoscopic nasopharyngeal exploration at the end of conventional curettage adenoidectomy

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Abstract Adenoid hypertrophy (AH) is a common cause of airway obstruction in children and its recurrence after conventional curettage adenoidectomy is not rare. The purpose of this study is to assess the efficacy of endoscopic nasopharyngeal exploration at the end of curettage adenoidectomy on decreasing the incidence of adenoid re-hypertrophy. Three hundred and fifty children diagnosed as having AH, underwent conventional curettage adenoidectomy by a single surgeon. The cases were randomly divided into two equal groups A and B, group B were further subjected to nasopharyngeal exploration by the nasal endoscope after removal of their adenoids with cauterization of any visible residuals, while group A were not subjected to this endoscopic maneuver. Follow-up was carried out for at least 2 years; flexible nasopharyngoscopy was used for detection of recurrent AH. Cases that were not subjected to endoscopic nasopharyngeal exploration (group A) showed a high recurrence rate (6.6%), while explored cases (group B) showed a low incidence of recurrence (1.18%). Most recurrence of group A (6%) was detected within the first year of the follow-up period which may indicate re-growth of residual adenoidal tissues that were missed during conventional curettage adenoidectomy. Endoscopic nasopharyngeal exploration at the end of conventional curettage adenoidectomy is a useful method in decreasing the incidence of recurrent AH.

Keywords Adenoid · Adenoidectomy · Nasal endoscopy · Nasal obstruction

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Introduction

Despite widespread use of antibiotics and prophylactic vaccinations, adenoid hypertrophy (AH) is still the most frequent otolaryngological condition and one of the most common indications for surgery in children [1]. Recurrent upper respiratory tract infections are often considered as one of the primary and important factors contributing to abnormal hypertrophy of pharyngeal Waldeyer's ring of lymphatic tissue [2]. General symptoms of AH include nasal obstruction, snoring, mouth breathing, and otological and rhinological problems (i.e., recurrent otitis media and rhinosinusitis), often requiring appropriate and, in many cases, surgical treatment. Consequently, the removal of tonsils and adenoids is one of the most common surgical procedures [1, 3, 4].

Several adenoidectomy methods have been well described in the literature, the most common of which is the curettage adenoidectomy technique after blind digital palpation of nasopharynx [5].

Adenoid curette guided by a trans-oral mirror and a headlight is a simple and quick procedure that has already been in use for a long time [6, 7]. However, these techniques carry a high risk of recurrence unless done by a well-experienced surgeon. Recent methods, such as curved suction electrical coagulator [6] and the curved microdebrider shaver trans-orally [7, 8] guided by a trans-oral indirect mirror or a 45° endoscope, have successfully been used. Endoscopic-guided adenoidectomy using a classic adenoid curette has also been described [9]. Becker et al. [4] described a combined trans-nasal and trans-oral technique for adenoid removal under endoscopic visualization, while Koltai et al. [10] described a power-assisted adenoidectomy technique without the use of nasal endoscope, a technique that requires the use of more expensive equipment as a bent

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shaver blade to properly fit the nasopharynx. Yanagisawa and Weaver [11] used the same technique with endoscopic vision but they found difficulty in maneuvering the microdebrider tip into the nasopharynx. Trans-oral endoscopic adenoidectomy was used by El-Badrawy and Abdel-Aziz [12]; although the technique is simple, it needs special instruments that may be not available in the theater.

The aim of this study was to assess the efficacy of endoscopic nasopharyngeal exploration at the end of curettage adenoidectomy in decreasing the incidence of adenoid re-hypertrophy.

Materials and methods

This prospective study was conducted on 350 children diagnosed as having AH (with or without tonsillar hypertrophy). Their ages ranged between 3 and 7 years (with a mean of 4.42 ± 1.2), 221 females and 129 males. All cases were collected from the otolaryngology clinic of the Pediatric Hospital of Cairo University from December 2006 to April 2009. Informed consents were obtained from the parents of the patients and the principles outlined in the Declaration of Helsinki were followed.

The following inclusion criteria were adopted:

- Adenoid hypertrophy was the only cause of nasal obstruction.
- All cases should be free of any craniofacial anomalies.
- Children suspected to have nasal pathology such as allergic rhinitis and/or deviated septum were excluded.
- No age or sex was excluded.
- Patients who missed follow up were excluded.

All cases were subjected to the following:

- Preoperative assessment
  - Full history taking and ENT examination.
  - X-ray nasopharynx, lateral view.
  - Routine preoperative investigations.
- Operative procedure: Under general anesthesia with oral endotracheal intubation, the cases were divided randomly into two equal groups (A and B); patients of both groups were subjected to adenoid removal conventionally by a single surgeon using adenoid curette with the aid of posterior nasal mirror. After completion of the procedure, hemostasis was carried out by nasopharyngeal packing for about 10 min or till the end of tonsillectomy operation which was carried out for 106 cases. After removal of the packs, group B were further subjected to nasopharyngeal exploration by the aid of rigid nasal endoscope (2.7 mm in diameter, 0 and 30°). Diathermy cauterization was used to ablate any adenoidal tissue residuals seen during endoscopy. A sucker metallic tube (isolated by a rubber nelaton catheter except its tip) was passed—in front of the endoscope—from one side of the nose to the nasopharynx to touch the residual adenoidal tissues and unipolar diathermy was then used for cauterization. The procedure was repeated on the other side.
- Postoperative follow up: Children were seen postoperatively at 1 week, with follow up appointments at 6 months, 1, and 2 years. In each follow up visit, all cases were subjected to flexible nasopharyngoscopic examination after topical application of a mixture of 4% lidocaine and 0.05% oxymetazoline hydrochloride for decongestion and anesthesia of nasal cavity. Obstructive adenoid was considered when the adenoidal tissues obstruct more than 50% of the choanal opening; in the term of third or fourth degree choanal obstruction according to the scale of Cassano et al. [13], recurrent obstructive adenoid hypertrophy was recorded and comparison between both groups was carried out.

Statistical method

The data were coded and entered using statistical package SPSS version 15 for windows. Data were summarized using mean ± SD for quantitative variables and frequency and percentage for qualitative variables. Comparison between both groups was done using Student's *t*-test and Chi-square test with a level of significance of $p < 0.05$.

Results

Three hundred and fifty children were subjected to adenoidectomy with or without tonsillectomy using the conventional trans-oral curettage technique by a single surgeon. The cases were divided randomly into two equal groups (A and B), group B were further subjected to endoscopic examination after removal of their adenoids. The mean age of group A was 4.7 ± 1.3 years and of group B was 4.5 ± 1.4 years, the difference between both groups was statistically insignificant.

Residual adenoid tissues were detected and cauterized in 36 (20.5%) out of 175 cases of group B.

No postoperative complications were reported in any patient.

Regarding the follow up (Table 1), 10 cases of group A and 7 cases of group B missed follow-up and they were excluded from the study.

After 6 months, recurrent obstructive adenoid was recorded in five cases of group A and in no cases of group B.

Table 1 Comparison between both groups in relation to the time of detection of recurrent AH

Recurrent AH	At 6th month	At 1st year	At 2nd year	Total
Group A ($n = 165$)	5 (3%)	5 (3%)	1 (0.6%)	11 (6.6%)
Group B ($n = 168$)	0 (0%)	1 (0.59%)	1 (0.59%)	2 (1.18%)

Cases who developed recurrent adenoid were subjected to revision adenoidectomy.

After 1 year, recurrent obstructive adenoid was recorded in five cases of group A and in one case of group B, they were subjected to revision adenoidectomy.

After 2 years, recurrent obstructive adenoid was recorded in one case of group A and in one case of group B, they were subjected to revision adenoidectomy.

By the end of the follow up period, the total recurrence was detected in 11 cases of group A and only in 2 cases of group B. The comparison between both groups was statistically significant (p value $= 0.01$).

Discussion

In the pediatric population, AH may cause nasal obstruction and obstructive sleep disorder and contribute to the pathogenesis of rhinosinusitis, recurrent otitis media, and otitis media with effusion. The success of adenoidectomy in treating these conditions is well documented [3].

Our study showed the importance of endoscopic exploration of the nasopharynx after conventional curettage adenoidectomy, as this classic method of adenoid removal may leave residual adenoidal tissues that may re-grow resulting in recurrent obstructive symptoms. We detected residual adenoidal tissues after conventional curettage adenoidectomy in 20.5% of cases that were subjected to endoscopic exploration. Saxby and Chappel [14] found some residual adenoidal tissues evident on nasopharyngoscopy in 68%, of which 24% had significant obstruction. Also, Regmi et al. [15] reported that conventional curettage adenoidectomy usually misses a substantial amount of adenoid tissue in more than 60%. By the end of a 2-year follow-up, recurrent obstructive adenoid was detected in 6.6% of cases that were not subjected to nasopharyngeal endoscopic exploration, while it was detected in 1.18% of cases that were explored with cauterization of any residual adenoidal tissues. Songu et al. [16] compared endoscopic assisted adenoidectomy with conventional curettage adenoidectomy; they found no significant difference between both techniques regarding recurrent obstructive nasal symptoms despite the superiority of endoscopic method in decreasing the adenoidal size after surgery, however, their study sample was small (38 patients). Ezzat [17] studied 312 adenoidectomy patients; with endoscopic examination of 122 patients, he found residual obstructive adenoidal tissues that were missed after conventional adenoidectomy in 14.5%, however, adenoidectomies were not done by a single surgeon with different experience and surgical talent between otolaryngologists, telephone questionnaire was used in the follow-up of patients and it showed recurrence in 5.6% in the non-endoscopically examined group while it was 0.85% in the endoscopically examined group. As recurrence of nasal obstructive symptoms after conventional adenoidectomy is not rare, many authors recommended endoscopic assisted technique for more complete removal and consequently to decrease the recurrence rate [15, 17–19].

In cases who underwent adenoidectomy without endoscopic exploration, there was a point of particular importance in that most of recurrent obstructive adenoids were detected early (6 months and 1 year postoperatively): 10 out of 11. This may be due to residual adenoidal tissues that were missed during conventional technique and may grow again causing recurrent obstructive symptoms. While by the end of 2 years, the incidence of recurrence was nearly equal, 0.59 and 0.6% in cases that were performed with endoscopic nasopharyngeal exploration and cases that were performed without using the same method of visualization, respectively. This may be due to either very small residual (not seen during nasal endoscopy) that may grow over a long period of time or may be due to re-growth of adenoid tissues after complete removal. However, the incidence of re-growth of adenoidal tissues and recurrence of symptoms is not exactly known. Buchinsky et al. [20] found no re-growth in children following adenoidectomy, while Emerick and Cunningham [3] attributed the cause of recurrent symptoms after adenoidectomy to recurrent or residual adenoid, and/or tubal tonsil hypertrophy. Also, recurrent upper respiratory tract infections after adenoidectomy may play a role in recurrence of AH [3, 12], a point that was not taken into our consideration during the study design.

Nasopharyngeal endoscopic exploration after conventional curettage adenoidectomy has several advantages; it does not need expensive equipments as all used instruments are already present in the operating theater, and it does not take more than 5 min after removal of the adenoid, and it makes the surgeon able to clear the nasopharynx from all residual adenoid tissues that usually could not be seen by the conventional method.

Finally, we conclude that endoscopic nasopharyngeal exploration at the end of conventional curettage adenoidectomy is a useful method in decreasing the incidence of recurrence.

Conflict of interest None.

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