Indian J Otolaryngol Head Neck Surg
(January 2014) 66(Suppl 1):S257–S260; DOI 10.1007/s12070-011-0467-4

ORIGINAL ARTICLE

Is Transnasal Endoscopic Examination Necessary Before and After Adenoidectomy?

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Received: 9 October 2011 / Accepted: 26 December 2011 / Published online: 6 January 2012

Abstract The present study aimed to investigate the amount of residual adenoid tissue following the conventional adenoidectomy as compared with preoperative values. A total of 32 girls and 44 boys (range, 3–15 years) in whom adenoidectomy procedure was planned were included in the study. Adenoid tissue sizes before adenoidectomy and residual tissue sizes after conventional curettage adenoidectomy were measured by transnasal endoscopic examination and were recorded. Adenoid tissue size before and after adenoidectomy was compared. The mean age of the patients was 7.7 years (range, 3–15 years). Before adenoidectomy grade 4 adenoid tissue was noted in 43.4% ($n = 33$), grade 3 was noted in 28.9% ($n = 22$), grade 2 was noted in 25% ($n = 19$), and grade 1 was noted in 2.6% ($n = 2$) of the patients. Following adenoidectomy, no significant difference was noted with respect to residual adenoid tissue sizes of grade 4 and grade 3 patients ($P = 0.75$, $P = 0.76$). Transnasal endoscopic examination is suggested to be the most appropriate method to assess the amount of residual adenoid tissue after conventional curettage adenoidectomy. The residual adenoid tissue with the help of a microdebrider in case of a large residual adenoid tissue located in the choana are necessary for complete adenoidectomy.

Keywords Adenoidectomy · Nasal fiberoptic endoscopy · Adenoid

Introduction

Since the description of the term "adenoid vegetation" by Meyer in 1868, adenoidectomy has become one of the most frequently performed surgical procedures [1]. The most common indications for adenoidectomy are infectious and obstructive reasons [2].

In order to overcome the disease caused by the adenoid tissue, the most important feature of adenoidectomy is the total excision of the adenoid tissue without any macroscopic residual tissue [3].

The classical technique for adenoidectomy is the removal of the nasopharyngeal lymphatic tissue using adenoid curette or LaForce adenotome under general anesthesia via orotracheal intubation in the Rose's position and by inserting a Crowe-Davis mouth gag [4].

Most of the surgeons perform this procedure blindly; i.e., without visualization of the nasopharynx. However, studies have shown that adenoid tissues, especially those with intranasal extension and causing obstruction, are inadequately removed by conventional curettage adenoidectomy in most of the patients with clinically significant adenoid hypertrophy. There are several studies which have described alternative methods for efficient removal of adenoid tissue without any residual tissue, as well as for bleeding control. As endoscopic sinus surgery has become popular in 1990s, performance of adenoidectomy by direct visualization has been introduced [5].

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Havas and Lowinger were the first to examine the adenoid tissue with intranasal extension obstructing the posterior choana following traditional curettage adenoidectomy under endoscopic view in 2002, and they performed residual adenoidectomy with the help of a shaver intraoperatively [6].

There is almost no recurrence after endoscopic adenoidectomy; however, this procedure is relatively more expensive and time consuming as compared with other methods [7].

The presence of residual adenoid tissue has been shown in several studies, and novel techniques, technologies, and instruments have been used to leave as minimal residual tissue as possible. However, there is no clear information in the literature about the amount of residual adenoid tissue. This study was designed to objectively investigate the amount of residual adenoid tissue following the conventional adenoidectomy as to compare adenoid volume before and after adenoidectomy.

Fig. 1 Transnasal endoscopic examination before adenoidectomy

Materials and Methods

This study was performed to prospective longitudinal clinical study. The study was approved by the Local Clinical Ethical Board and both verbal and written informed consents were obtained from all patients. Patients admitting to Department of Otolaryngology at Haseki Hospital between July 2010 and September 2010, in whom adenoidectomy was planned, were included in the study. A total of 76 patients (32 girls and 44 boys) were included. The mean age of the patients was 7.7 years (range, 3–15 years). Patients with previous history of adenoidectomy, who had taken intranasal topical or systemic steroid in the last 1 year, and anatomic anomaly or acute infection in nose, palate or nasopharynx, genetic diseases (Down Syndrome), neurological diseases and cardiovascular diseases, velopharyngeal insufficiency, soft palate cleft, tubaric/nasopharyngeal stenosis and those with nasopharyngeal infection, or those with mass other than adenoid tissue were excluded.

Surgical procedures were performed under general anesthesia by two experienced otolaryngologists using the same adenoidectomy technique. Orotracheal intubation was performed in the supine position. In order to better visualize the nasopharynx, merocel soaked with oxymetazoline hydrochloride was placed inside the two nasal passages. The merocel was removed after waiting for approximately 5 min. The nasopharynx was examined via a 0°, 2.7 mm rigid fiber-optic endoscope (Storz, Germany) introduced through the nose (Fig. 1). Based on the method defined by Cassano et al. [8] in which fiber endoscopic images of the choanal openings were divided into four segments from the upper choanal border to the nasal floor, the sizes of the hypertrophic adenoid tissue were recorded as: (1) First grade, obstruction of only the upper part of the choana (<25%); (2) Second grade, obstruction of the upper half of the choana (<50%); (3) Third grade, obstruction extending to the rhinopharynx and partial involvement of the tube ostium (<75%); (4) Fourth grade, almost complete obstruction of the choana.

A Crowe-Davis mouth gag was inserted to open the mouth with the patient's head in extension. The soft palate and uvula were examined. In order to lift the soft palate and the uvula, a small nelaton catheter was inserted through the nose into the oral cavity, brought out from the mouth and fixed outside.

The nasopharynx and the hypertrophic adenoid tissue were re-examined by palpation. The hypertrophic adenoid tissue was curetted without visualization using a sharp adenoid curette of appropriate-size (Shambaugh adenotome). Once ensured that there was no remaining adenoid tissue, the curettage procedure was ended. Adenoid tissue bed was cleansed from hanging pieces of adenoid tissue using a sponge. A nasopharyngeal sponge was placed into the adenoid tissue bed for homeostasis and removed after waiting for approximately 5 min. The mouth gag was removed and the nasopharynx was re-examined using a 0°, 2.7 mm rigid fiberoptic endoscope (Storz, Germany) inserted through the nose. (Fig. 2) The size of the residual adenoid tissue was evaluated using the method defined by Wang et al. [9] in which the relative adenoid size was estimated according to the distance between the vomer and the adenoid tissue. Accordingly, the size of the

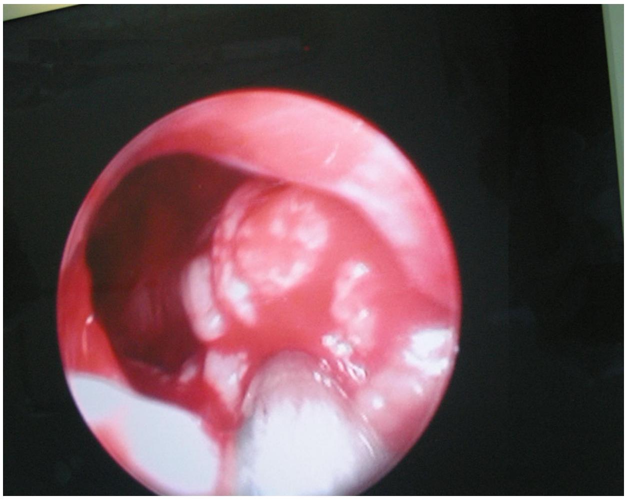

Fig. 2 Transnasal endoscopic examination after adenoidectomy

residual adenoid tissue was classified as: (1) small, if the distance between the vomer and the adenoid tissue was >1 cm; (2) moderate, if the distance between the vomer and the adenoid tissue was 0.5–1 cm; and (3) large, if the distance between the vomer and the adenoid tissue was <0.5 cm.

In patients with large residual adenoids who were grade 4 at baseline, complete adenoidectomy was performed under endoscopic vision, with the use of a powered shaver (Bienair Osseo due Powered System with a 2.9 mm, BIEN-Air Surgery S.A., Le Noirmont, Switzerland) by reaching the nasopharynx after passing through the nose (without traumatizing the nasal passage, septum, conchae and torus tubarius in the nasopharynx). Preoperative or postoperative complications were not observed in any of the patients.

The preoperative results obtained by using the classification of Cassano et al. [8] were compared with postoperative results obtained by using the classification of Wang et al. [9].

Statistical analysis was performed using medcalc statistical program v11.5.1. The data were analyzed using the Fisher's exact test. A P value <0.05 was considered statistically significant.

Results

The mean age of the patients was 7.7 years (range, 3–15 years). No complications associated with adenoidectomy such as hemorrhage, velopharyngeal insufficiency or nasopharyngeal stenoses were observed in any of the patients on nasopharyngeal endoscopic examination that was performed at the 1st postoperative month.

On preoperative examination, 43.4% ($n = 33$) of the patients were grade 4, 28.9% ($n = 22$) of the patients were grade 3, and 25% ($n = 19$) of the patients were grade 2. "Large" residual adenoid tissue was noted in 18.4% ($n = 14$) of the patients and "moderate" residual adenoid tissue was noted in 23.6% ($n = 18$) of the patients on postoperative endoscopic examination. Complete removal of adenoids was achieved in 57.8% of the patients.

Following adenoidectomy, there was no significant difference with respect to the residual adenoid tissue sizes of grade 4 and grade 3 patients ($P = 0.75$, $P = 0.76$; Table 1).

No significant difference was found with respect to the residual adenoid tissue sizes of grade 3 and grade 2 patients following adenoidectomy ($P = 0.67$, $P = 0.71$; Table 1).

Discussion

Recently, endoscopic examination is the gold standard for nasopharynx examination [10]. The most significant feature of the method is that although providing a 2-dimensional image, it allows dynamic 3-dimensional assessment when the endoscope is moved.

The aim of adenoidectomy is the removal of hypertrophic adenoid tissue which leads to obstruction of the nasopharyngeal airway and causes other respiratory tract diseases such as recurrent sinonasal and middle ear diseases. Following adenoidectomy, the presence of any residual adenoid tissue in the pharyngeal roof close to choanal opening may cause obstructive symptoms or Eustachian tube dysfunction. Residual adenoid tissue may also lead to postoperative bleeding [3]. Residual tissue may also result in re-growth or recurrence; thus, prevention of these problems also prevents the need for future surgical procedures. Studies have shown

Table 1 Distribution of preoperative and postoperative endoscopic examination findings of the patients

Postoperative examination	Preoperative examination					
	Grade 4 n	Grade 3 n	Grade 2 n	Grade 1 n	Total n (%)	P
Large	8	4	2	0	14 (18.4)	0.76
Moderate	10	5	3	0	18 (23.6)	0.71
Small	15	13	14	2	44 (57.8)	NS
Total, n (%)	33 (43.4)	22 (28.9)	19 (25)	2 (2)	76	NS
P	0.75	0.67	NS	NS	NS	

that residual tissue is most frequently observed in the choanal opening [3, 9].

Since the commonly used curettage adenoidectomy is sometimes inadequate and unsafe, alternative adenoidectomy techniques have recently been developed in parallel to the advances in fiberoptic and endoscopic systems [6]. While curettage adenoidectomy, which is performed blindly without direct visualization, may lead to injuries in structures such as choana, nasopharyngeal mucosa and torus tubarius; it is also possible to experience similar problems following adenoidectomy performed using forceps or adenoid punch under endoscopic view [11].

In our study, residual adenoid tissue classified as "large" was noted on postoperative examination in 18% of the patients. Ezzat [7] suggested that residual adenoid tissue could be observed in 50% of the patients following conventional adenoidectomy; however, he provided no information about the amount of residual adenoid tissue in this patient population. In another study, Pagella et al. [5] reported that 48.9% of the patients had residual adenoid tissue following conventional adenoidectomy; however, no information regarding the size of the residual adenoid tissue was reported. We believe that our results will contribute to the literature regarding this missing piece of information.

In the present study, residual adenoid tissue following conventional adenoidectomy needed to be removed by transnasal endoscopic surgery using a microdebrider in at least 18% of the patients. We performed complete adenoidectomy in 8 patients with large residual adenoid tissue by transnasal endoscopic microdebrider adenoidectomy in this study.

In conclusion, following conventional curettage adenoidectomy, which is a widely used procedure both in Turkey and worldwide, the transnasal endoscopic examination of the patients, as well as the removal of the residual adenoid tissue with the help of a microdebrider in case of a large residual adenoid tissue located in the choana are necessary for complete adenoidectomy.

Conflict of Interest None

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