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Original Article

Comparison of the effects of coblation and curettage adenoidectomy on adenoid regrowth

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Abstract

Aim: To investigate whether there is a relationship between coblation and curettage adenoidectomy techniques in adenoid recurrence.
Material and Methods: An electronic medical database was used to identify the records of 84 children who were performed adenoidectomy without tonsillectomy between January 2016 and January 2019. Patients who had adenoid hypertrophy without a history of revision surgery and underwent coblation or curettage adenoidectomy without tonsillectomy were included in the study. Operation notes were recorded. Adenoid regrowth was evaluated by flexible nasal endoscopy in patients who completed at least a 1-year follow-up period.
Results: 51 and 33 patients met the inclusion and were comprised of coblation and curettage groups, respectively. The mean operative time was 14.5±5.1 min in the curettage group and 23.3±11.4 min in the coblation group (p=0.001). The mean intraoperative blood loss was 5.75±3.6 ml in the coblation group, and 11.58±7.2 ml in the curettage group (p=0.007). At the end of a 1-year follow-up period, adenoid regrowth rate was observed in 5.66% in the curettage group and 2% in the coblation group and this difference was statistically significant (p=0.027).
Conclusion: Coblation adenoidectomy represents a reliable and highly effective method that has a low incidence of regrowth and less intra-operative bleeding but has a longer operation time in comparison with conventional cold curettage adenoidectomy.

Keywords: Curettage adenoidectomy; coblation adenoidectomy; adenoidal regrowth.

INTRODUCTION

Adenoidectomy represents one of the most common ear, nose, and throat surgeries around the world (1). The surgical removal of the adenoid tissue, generally in conjunction with a tonsillectomy, is frequently recommended in children. Obstructive sleep apnea (OSA), adenoid hypertrophy, nasal obstruction, chronic serous otitis, chronic otitis media, and chronic adenoiditis are the common indications for adenoidectomy (2). According to various authors, the recurrence rate after adenoidectomy is 1.3% to 26%, which is important to observe since about 0.5% to 3.0% of patients undergo surgery because of symptomatic regrowth of adenoid tissue (3-5). It is controversial why and how the regrowth of adenoid tissue occurs. The possible causes of adenoid regrowth are not well understood. Asthma, immune deficiency, sinusitis, reflux, allergic events, and so as to perform adenoidectomies, such as suction diathermy, molecular resonance, microdebrider, coblation, and laser (7). Adenoidectomy methods have changed significantly over time.

In the present study, we aimed to compare the intraoperative blood loss, operation time, the presence of adenoid tissue, and the prevalence of adenoid regrowth in a 1-year follow-up period after adenoidectomy in the patients who underwent coblation adenoidectomy in comparison with curettage adenoidectomy.

MATERIAL and METHODS

The ethical committee of the tertiary referral center approved this retrospective study. An electronic medical database was used to identify the records of children aged between 4 and 12 years old who had an adenoidectomy without tonsillectomy between January 2016 and January 2019. The medical records including daily notes, operative notes including surgical techniques and intraoperative

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details, and sizes of the adenoid were obtained from the electronic database. The patients who had one or more of the following were excluded from the study: a history of oropharyngeal surgery, bleeding tendency, allergic rhinitis, down syndrome, systemic disease that could affect epithelial healing, laryngopharyngeal reflux, secondhand smoke exposure and lost to follow-up before 1 year.

The same surgeon examined all patients for adenoid regrowth according to endoscopic examination. Physical examination was performed three times: preoperatively, in the 1st month, and 1 year after. Adenoid regrowth was evaluated in the children who completed at least a 1-year follow-up. The same physician evaluated adenoid regrowth visually according to endoscopic examination, and the proportion of the nasopharynx occupied by adenoid tissue was recorded. Regrowth estimates were measured in 10% increments. When absolutely no adenoidal tissue was noted, the variable was recorded as 0%. If any adenoid tissue was seen, the value was recorded at no lower than 10% (8).

The sizes of adenoids were subjectively graded and reported based upon a numerical scale. An adenoid size of 1+ denotes 0% to 25% obstruction of the choanae, 2+ denotes 25% to 50% obstruction, 3+ denotes 50% to 75% obstruction, and 4+ denotes 75% to 100% obstruction. This scale has been proposed as a standardized grading scale for adenoid size, which was adopted from the tonsillar hypertrophy grading scale (9).

Surgical techniques

Routine preoperative and anesthetic evaluations were performed. All patients were informed about the selection of adenoidectomy technique. A surgeon using a coblator or the conventional cold curettage technique randomly operated the patients. One of the two experienced surgeons performed all the operations in our study. The Crowe-Davis mouth gag was utilized for opening the mouth. A small nelaton catheter (8 Ch) was passed through the nose of the patient, and its insertion through the oral cavity was performed. In the conventional cold curettage group, a large dental mirror and variable sized adenotomes were used to remove adenoids. At the end of the surgery, the same mirror was used to evaluate residual adenoid tissue and bleeding in the nasopharynx. In the coblation group, the coblator was used trans-orally into the nasopharyngeal space. 00 and 300 telescopes were inserted intra-nasally to visualize the nasopharynx during the coblation adenoidectomy.

The operation was completed when the choanae were clearly observed. The volume of blood in the suction bottle, the total weight of mops and gauze used during surgery were measured in order to calculate intra-operative blood loss. Blood loss was measured in milliliters. Furthermore, the operation time was recorded in minutes and seconds. All patients were discharged the day after the procedure. Standard postoperative care was applied to the patients. The study surgeon in the hospital carried out the postoperative follow-up controls in the 1st month and 12th month.

Statistical Analysis

Numeric data are presented as mean ± standard deviation. An independent samples t-test was conducted for continuous variables. The patient characteristics are summarized with percentages for categorical variables and mean and standard deviation for continuous variables. SPSS version 22 (IBM, Armonk, NY) for Macintosh was used to conduct statistical analyses. The value of $P<0.05$ was accepted as statistically significant.

RESULTS

Totally, 84/101 children fulfilled the inclusion criteria and were included in the study with a mean follow-up of 16.2 months (range 12-26 months). 51 and 33 patients comprised the curettage and coblation groups, respectively. The demographic data of children and their clinical characteristics are shown in Table 1. The patients' age varied between 3 and 12 years (mean =5.1 years). The mean age did not differ significantly between the two groups. A total of 84 patients, consisting of 58% males and 42% females, participated in the study. The gender ratio, weight, preoperative adenoid grade, and preoperative tonsil grade were not different between the two groups. Grade 3+ adenoid hypertrophy was the most common type of hypertrophy encountered.

Residual adenoid tissue was not encountered at the first follow-up visit of children who underwent an adenoidectomy. Adenoid regrowth was seen in 8 (15.6%) children in the curettage group and 2 (6.06%) children in the coblation group after 1-year follow-up period, based on the scale of increments of 10%. The majority of adenoid growths in the curettage group reached grade 3+ hypertrophy and required revision surgery (5/8 children, 9.8%). In contrast, grade 1 or 2 hypertrophy was observed in all of the adenoid growths in the coblation group, and no patients required revision surgery. Comparison of regrowth rates of both groups at the end of the 1-year follow-up period showed a statistically significant difference (P=0.000) (Table 2).

In the group of patients who had undergone curettage adenoidectomy, the mean operative time was 14.5±5.1 min; among patients who had undergone coblation adenoidectomy, the mean operative time was 23.3±11.4 min (p=0.001). The mean intraoperative blood loss was determined to be 5.75±3.6 ml in the coblation adenoidectomy group, and 11.58±7.2 ml in the curettage adenoidectomy group (p=0.007).

The mean age of the adenoid regrowth group (5.9±2.22 years) and no regrowth group (5.2±3.21 years) did not differ statistically significantly. No difference was determined between the two groups in terms of gender ratio and weight (p>0.05 for both). The preoperative grade of the adenoids was similar in patients with regrowth from patients without regrowth (p=0.422).

Table 1. Demographic details and patient characteristics of the patients between the groups

	Coblation group (n=51)		Curretage group (n=33)	
	Number or Mean ± SD	%	Number or Mean ± SD	%
Male	31/51	60.7	18/33	54.5
Female	20/51	39.3	15/33	45.5
Age (year)	4.77±3.18		5.13±3.34	
Weight (kg)	25.14±9.11		24.17±11.04	
Preoperative Adenoid Grade				
1+	-		-	
2+	4/51	7.8	2/33	6.06
3+	26/51	50.9	17/33	51.5
4+	21/51	41.1	14/33	42.4

Table 2. Adenoid regrowth rates with characteristics between the groups

	Coblation group (n=51)			Curretage group (n=33)			
	n	%	Mean±SD	n	%	Mean ± SD	p value
Regrowth Age (year)	-	-	6.01±1.01	-	-	5.77±2.49	NS
Adenoid Regrowth Rate	2	6.06	12.49±18.7	8	15.6	41.14±32.34	0.000
Required revision surgery	-	-	-	5	9.8	64.1±18.8	

NS; not significant, SD; standard deviation

DISCUSSION

A number of various surgical techniques have been introduced for adenoidectomy. The most recent studies have shown effectiveness as the most important factor and cost as the least important factor in affecting the instrument choice for adenoidectomy (7). The coblation plasma technology leads to low-temperature molecular degradation with minimal necrosis surrounding the adenoid tissue. Due to benefits such as perfect hemostasis and postoperative pain reduction, coblation adenoidectomy has gained wide acceptance and popularity in recent years (7-11). The following can be listed among the primary disadvantages of the curette technique: being a treatment which is less sensitive, probably less effective, has the risk of blood loss, neck pain, and velopharyngeal insufficiency. Furthermore, conventional cold curettage adenoidectomy may not remove the adenoids at all time (12).

Despite a number of methods available for adenoidectomy, there are only a few studies that compare these two techniques directly. When conventional cold curettage adenoidectomy and coblation adenoidectomy are compared, it is observed that coblation adenoidectomy has several advantages, such as shorter operation time, perfect hemostasis, reduction of postoperative pain, accurate removal of the adenoid tissue from the nasopharyngeal anatomy, and a shorter recovery period. On the other hand, coblation is more expensive than the traditional method (13). However, it was found out that the coblation adenoidectomy technique had a longer operative time. For other postoperative complications, no significant difference was determined in our study.

In the present study, we examined the appearances of residuality and regrowth after adenoidectomy, and the adenoidal-nasopharyngeal ratio represented adenoid regrowth. It is possible to detect adenoid tissue using a number of methods (14,15). In general, endoscopy and lateral neck radiography represent the two methods most frequently utilized by otorhinolaryngologists. In the current study, endoscopy techniques were performed three times for each patient to evaluate residuality: preoperatively, in the 1st month, and 1 year following adenoidectomy. The reason for this is that residual adenoid tissue cannot be differentiated from the definition of regrowth soon after surgery.

Although the adenoid regrowth prevalence changes depending on the research, the pooled prevalence of adenoid regrowth is estimated to be 1.3% to 26% from the studies carried out on patients (16,17). The reason for this discrepancy is not clear, but the distinction between diagnostic tools and the exact definition of "comparable" may be related to the respective study. In a series including 13.000 adenoidectomies, in which the conventional adenoidectomy technique with curettage was utilized, a 0.55% revision rate was observed within a period of 11 years (18). Kim et al. recently demonstrated that adenoid regrowth was observed in approximately 2% of children who had undergone coblation adenoidectomy at 1 year of age and the majority of the patients were asymptomatic (19). In our study, the recurrence rate during a 1-year follow-up period after curettage adenoidectomy was determined to be 15.6% and the revision adenoidectomy rate was determined to be 9.8%. The recurrence

rate during a 1-year follow-up period after coblation adenoidectomy was 6.06%, and none of them required revision adenoidectomy.

Multiple studies have demonstrated that the adenoids have not been adequately removed in most of the children who have undergone blind curettage adenoidectomy (7,11,20). The revision adenoidectomy rate of 0.85% was determined within a period of 2 years in a total of 102 patients who had undergone endoscopic examination when adenoidectomy was completed, and the revision rate was determined to be 5.6% in these studies when the endoscopic examination was not carried out (20). The residual adenoid tissue is not evaluated appropriately by the digital palpation method. To reduce residual adenoids, it is inevitable to use such methods (direct or indirect visualization) by means of an endoscope or dental mirror. Most of the time, the terms can be used interchangeably. 'Residual' is related to a surgical technique, while 'regrowth' can be interpreted as spontaneous (20). The present study demonstrated that a visualization technique was needed to perform adenoidectomy for complete adenoid tissue removal.

We concluded that the adenoidectomy technique was associated with adenoid regrowth. There might be a relationship between the presence of residual adenoids and a higher risk of recurrence. Finger palpation or visualization with mirror may not be sufficient to determine the residua. Coblation adenoidectomy may be considered as a superior technique in terms of residual tissue because of using the endoscopes. This study also demonstrated that despite the occurrence of regrowth of adenoid tissue was 6.06% in the coblation group, it was not symptomatic and didn't require revision surgery.

This study was retrospective. Our study had some limitations. Firstly, volumetric analysis of the adenoid tissue was not performed. Secondly, cephalometric radiography was not routinely performed for all children during this study. Furthermore, the effects of ventilation tube insertion during adenoidectomy or the presence of allergic rhinitis on adenoid regrowth were not investigated. The final limitation is that the present study had a follow-up period of only 1 year, and thus, longer studies should be carried out in the future.

CONCLUSION

In general, we believed that in accordance with the results of the present study coblation adenoidectomy seems to be a reliable and highly effective method. This study was also carried out to understand the possible risk factors associated with adenoid regrowth better, such as inadequate adenoidectomy and the high preoperative grade of the adenoid tissue and palatine tonsils. Based on our findings, coblation adenoidectomy techniques had lower bleeding rates but longer operation times when compared to the conventional technique.

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