Adenoidectomy: comparison between the conventional curettage technique and the coblation technique in pediatric patients

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Received 27 January 2016
Accepted 28 January 2016

The Egyptian Journal of Otolaryngology
2016, 32:152–155

Objective
The aim of this study was to compare the advantages and disadvantages of the coblation technique with the standard conventional curettage technique in the operation of adenoidectomy in pediatric patients.
Study design
This was a prospective randomized clinical study.
Patients and methods
From January 2010 to December 2014, 200 patients presented with obstructive adenoid hypertrophy. Their ages ranged between 3 and 10 years. The patients were classified randomly into two equal groups: group A was subjected to conventional curettage adenoidectomy and group B was subjected to coblation-assisted adenoidectomy. Operative time and intraoperative blood loss were recorded. Patients were scheduled for follow-up on the first day and first and second postoperative weeks. They were asked to record their pain and discomfort on a standardized Wong–Baker faces pain rating scale from 0 (no pain) to 10 (severe pain). Postoperative complications and/or recurrences were also recorded. Follow-up was for at least 1 year, with re-examination of the nasopharynx by means of endoscopy and/or lateral nasopharyngeal radiography.
Results
The conventional curettage adenoidectomy group recorded significantly less operative time and the coblation-assisted adenoidectomy group recorded significantly less intraoperative blood loss and also lower incidences of postoperative bleeding and adenoid recurrence. Both groups demonstrated insignificant difference as regards postoperative pain.
Conclusion
The use of the coblation technology in adenoidectomy gave more advantage to the procedure with regard to less intraoperative blood loss and lower incidences of postoperative bleeding and recurrence rate.

Keywords:
adenoid hypertrophy, adenoidectomy, coblation, cold curettage

Egypt J Otolaryngol 32:152–155

1012-5574

Introduction

Adenoids, which are a nasopharyngeal lymphoid tissue forming a part of the Waldeyer's ring, were first described by Meyer in 1868 [1]. Its hypertrophy may lead to nasal obstruction with consequent mouth breathing and its sequelae, sleep-disordered breathing, speech abnormalities, feeding difficulties, craniofacial deformities, and recurrent upper respiratory tract infections (e.g. otitis media and sinusitis) [2]. Adenoidectomy operation either alone or combined with tonsillectomy and/or myringotomy with ventilation tube insertion has been a target for multiple research studies, to improve its quality and to minimize its side effects and complications, being a common procedure in the field of pediatric otolaryngology [3]. The ideal adenoidectomy procedure should achieve a safe removal of the adenoids with less operative time, blood loss, postoperative morbidity, and/or recurrence [4].

The widely used conventional cold curette adenoidectomy (CCA) was first described in 1885 [1]. The dissatisfaction from the curettage procedure resulted from recorded bleeding, inadequate removal, and eustachian tube and/or nasopharyngeal stenosis, which led to the development of technologies to improve the surgical methods of adenoid removal for reaching the most effective techniques [5]. Various methods have been developed besides the classic cold curettage adenoidectomy either used alone or in combinations, such as monopolar [6] and bipolar diathermy [7], radiofrequency [8], laser [9], microdebrider [5,10], stripping under endoscopic control [11], and coblation [12–14], aiming to reduce operative time, intraoperative blood loss, and postoperative morbidity [15]. Postadenoidectomy morbidity includes mainly discomfort and pain, primary or reactionary hemorrhage, and postoperative infection, resulting in secondary or delayed hemorrhage [4]. Reduction in those parameters may improve patient recovery time and satisfaction, with better social and economical implications.

The surgical technique of coblation adenoidectomy (Co-A) is based on the removal of the adenoid tissue using an adenoid curette, and, after a short period of compression hemostasis, the coblation is used to complete the hemostasis procedure with removal of any adenoid remnants, especially in difficult regions that may be not easily reachable such as the perichoanal and peritubal areas. The aim of this study was to compare the advantages and disadvantages of the coblation technique with the standard cold curettage technique in the operation of adenoidectomy in pediatric patients.

Patients and methods

This study was conducted between January 2010 and December 2014. We recruited pediatric patients from the Department of Otolaryngology, Magrabi Eye and Ear Institute, Riyadh, Kingdom of Saudi Arabia, and Tanta University Hospital. We designed a prospective randomized clinical study to compare the results of the classic CCA with the coblation technique (Co-A). The trial protocol was approved by the local ethics committees. Informed consent was obtained from the parents of the patients and the principles outlined in the Declaration of Helsinki were followed.

A total of 200 patients were included in this study. Their ages ranged between 3 and 10 years. They had chronic nasal obstruction and discharge, with symptoms and signs of adenoid hypertrophy. All patients were subjected to full ENT history taking and thorough clinical examination with full preoperative laboratory investigations. Adenoid hypertrophy was diagnosed by means of lateral nasopharyngeal radiography and/or nasal endoscopy under local anesthesia. The patients were randomly classified into two equal groups: group A was operated upon using the CCA method, and group B was subjected to Co-A. All surgeons participated in the study had the same surgical qualification and were almost at the same level of surgical training. Patients with bleeding disorders, debilitating diseases, tonsillar disease, nasal allergy, and/or acute upper respiratory tract infections were excluded from the study.

Operative techniques

All procedures were performed under general anesthesia with cuffed oral endotracheal intubation. The patients were placed in supine position with the table head tilted down 20°. The mouth was held open using a self-retaining Boyle Davis mouth gag. In group A, adenoidectomy was performed using an adenoid curette; complete removal was confirmed by visualization of the nasopharynx using a posterior rhinoscopy mirror, and hemostasis was achieved by packing adenoid ped of the nasopharynx for 10 min. In group B, Coblator II system (ENTec, a division of Arthrocare, Sunnyvale, California, USA) and the Evac T&A plasma wand (ENTec) at an intensity of 5 to 7 setting were used transorally to remove the adenoids, and a short period of compression hemostasis was carried out and bleeding points were also stopped using an intensity 9 setting on coagulation mode of the coblator device. The surgeon used a posterior rhinoscopy mirror to inspect the adenoid bed, with retraction of the soft palate using two rubber catheters. Operative time, which is measured from introduction to removal of the Boyle Davis mouth gag, was recorded. In addition, the intraoperative blood loss, which was measured using the weight of saturated swabs and adding it to the blood volume measured in an accurate pediatric container attached to the suction bottle, was calculated.

Postoperative follow-up

All patients received standard postoperative care and were discharged after 1 day, with home medications composed of antibiotic, analgesic (paracetamol), and decongestant nasal drops for 7 days. Patients were scheduled for examination at the end of the first and second postoperative weeks. They were asked to record their pain and discomfort on a standardized Wong–Baker faces pain rating scale, which is a reliable and valid pain assessment tool for children between 3 and 18 years of age [16]. Pain was assessed by asking the child to point to one of the 10 drawn faces with facial expression that best describes their pain, ranging from happy smiling face denoting no pain (score 0) to frowning face with tears denoting severe pain (score 10).

Patients' parents were asked about the smoothness of the early postoperative recovery – that is, occurrence of fever, emesis, neck stiffness, and the time needed for the return of the patient to normal diet and daily activities. Postoperative complications were also recorded and managed.

Patients were followed up for at least 1 year. Recurrence of nasal symptoms was recorded, and re-examination of the nasopharynx using endoscopy and/or radiography was performed by the end of the follow-up period.

Statistical methods

Quantitative variables were presented as mean and SD. The Kolmogorov test was performed to test normality. Parametric variables were compared between the studied groups using Student's *t*-test. Nonparametric variables were compared between the studied groups using the Mann–Whitney test. Qualitative variables were presented as frequency and percentage and compared between groups using the χ^2-test and Fisher's exact test. Significance level used was 0.05. SPSS, version 21 (SPSS version 21, IBM, USA) was used in data analysis.

Results

A total of 200 patients were included in the study. They were classified randomly into two equal groups. Group A was subjected to CCA, and group B was subjected to Co-A. Group A included 52 male and 48 female patients, whereas group B included 51 male and 49 female patients, with no significant difference between the two groups. The age range was 3–10 years at the time of surgery. The mean age in each subgroup was 6 years, with a SD of 1.28 in group A and 1.33 in group B; there was no significant difference in age between the two groups.

As regards the operative time (Table 1), there was a significant difference between the two groups. The mean operative time in group A was 10±1.15 min, which was lower than that in group B (15 ±1.37 min).

As regards the intraoperative blood loss (Table 1), the mean blood loss was significantly higher in group A (25±2.91 ml), compared with group B (10±2.58 ml).

During the first 24 h and during the first week postoperatively, the difference in pain scores was insignificant between the two groups. Moreover, there was no significant difference between the two groups with regard to the pain scores at the end of the second postoperative week (Table 1).

Table 1 Comparison of the two groups with regard to operative time, operative blood loss, and postoperative pain

Patient group	*N*	Mean	SD	*P* value	Significance
Operative time					
Group A	100	10.000	1.1503	0.000	Significant
Group B	100	15.000	1.3762		
Operative blood loss					
Group A	100	25.000	2.9172	0.000	Significant
Group B	100	10.000	2.5820		
Postoperative pain in first day					
Group A	100	4.520	0.5021	0.397	Nonsignificant
Group B	100	4.460	0.5009		
Postoperative pain by the end of first week					
Group A	100	1.510	0.5024	0.572	Nonsignificant
Group B	100	1.550	0.5000		
Postoperative pain by the end of second week					
Group A	100	0.000	0	1.000	No difference
Group B	100	0.000	0		

Five patients of group A developed reactionary postoperative hemorrhage, whereas only one patient developed reactionary postoperative hemorrhage in group B; there was a significantly lower incidence of reactionary hemorrhage in group B (P=0.037). The incidence of postoperative recurrence of the adenoid tissue was also significantly higher in group A than in group B; it was seen in 10 and two patients, respectively (P=0.001). No other complications developed in both groups.

Discussion

The use of coblation technology in adenoidectomy has been increasingly popular over the years [15]. In this study, 200 pediatric patients with obstructive adenoid hypertrophy were subjected to adenoidectomy. The patients were classified randomly into two equal groups, group A underwent adenoidectomy using the conventional curettage method (CCA) and group B underwent the procedure with the use of coblation (Co-A). Our results showed that coblation is a useful tool in reducing the amount of blood loss in pediatric adenoidectomies compared with the conventional curettage method. The mean blood loss was significantly lower in Co-A compared with CCA, being 10 and 25 ml, respectively. These findings are comparative to previous studies by Di Rienzo Businco *et al.* [13] and Ozkiris *et al.* [14], who proved that coblation adenoidectomy showed lower mean blood loss compared with cold curettage adenoidectomy.

The use of coblation may expand the operative time of adenoidectomy. Our study showed that the mean operative time of the procedure was 10 min for CCA, whereas it was 15 min for Co-A. Other studies have demonstrated the same finding. Di Rienzo Businco *et al.* [13] have accomplished the coblation procedure in 19 min, and Ozkiris *et al.* [14] have performed it 20.5 min. This could be attributed to the time used in the coblation technology groups to reach the narrow and difficult areas such as the perichoanal and peritubal areas and also to the use of coblation in ablation and hemostasis of the adenoid bed.

In our study, the pain scores were insignificant over the postoperative period for the two groups during the first 24 h and during the first and second weeks postoperatively. However, there was significantly less postoperative pain in the coblation group compared with the curettage group in the study by Di Rienzo Businco *et al.* [13] during the early days of the first postoperative week. This could be attributed to the presence of the curettage tissue trauma in both of our patient groups, which made the sense of pain and discomfort in both of our patient groups almost the same.

The incidences of postoperative reactionary were significantly higher in the CCA group compared with the Co-A group. This could be attributed to the effect of coblation on the bleeding points; it improves and secures hemostasis of the adenoid bed, leading to marked reduction of reactionary hemorrhage [17]. Coblation also provides less tissue burning and trauma compared with electrocautery, minimizes devitalization and infection of the adenoid bed, and therefore decreases the incidences of secondary infection and hemorrhage [4].

The incidence of postoperative regrowth of the adenoid tissue was also significantly higher in the CCA group than in the Co-A group; this is in agreement with the findings of Di Rienzo Businco *et al.* [13]. The coblation wand facilitated the precise removal of the adenoid remnants and helped in approaching the difficult-to-reach areas such as posterior choanae and around the eustachian tube openings, which are common sites of recurrent adenoid hypertrophy [18–20], leading to reduction in the recurrence rate of adenoid hypertrophy.

In our opinion, coblation added to the technique outcome of adenoidectomy by decreasing the incidence of operative and postoperative bleeding and reducing the recurrence rate. Despite the added cost of coblation in adenoidectomy surgery, its added advantages with regard to minimizing the bleeding and adenoid recurrence should be considered.

Conclusion

The use of coblation technology in adenoidectomy is more advantageous compared with the standard conventional curettage technique as regards the amount of intraoperative blood loss, the incidence of postoperative bleeding, and recurrence.

Conflicts of interest

There are no conflicts of interest.

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