A Comparative Study of Endoscopic Coblation Adenoidectomy and Regular Curettage Adenoidectomy in a Tertiary Care Hospital in Kerala

Abdul Salam R. T.[1], Shahul Hameed A.[2], Meera Rajan[3]

[1, 2, 3] Department of ENT, Government Medical College, Calicut, Kerala, India.

ABSTRACT

BACKGROUND

An ideal surgery to remove hypertrophied adenoid mass should be safe, with less bleeding and operation time along with post-operative improvement in the eustachian tubal ventilation and normal respiration. It should also have low morbidity and mortality. Among the various methods described for its removal, the two commonly used methods are conventional cold curettage method and coblation technique. The purpose of this study was to collate the safety and efficacy of endoscopic coblation adenoidectomy with the conventional curettage adenoidectomy.

METHODS

A prospective comparative study with fifty patients was studied who underwent adenoidectomy. Twenty five patients underwent endoscopy assisted coblation adenoidectomy and twenty five patients underwent regular adenoidectomy by curettage.

RESULTS

Patients who underwent coblation adenoidectomy showed better results during follow up in terms of completeness of removal. 80 % of children undergoing regular adenoidectomy by curettage method showed remnant adenoid tissue in the nasopharynx at the end of the procedure. But it was 6 % among the children undergoing endoscopic assisted coblation adenoidectomy. The mean duration of operation was higher for endoscopic assisted coblation adenoidectomy which was significant statistically. The mean blood loss was 30.36 ml in regular curettage adenoidectomy; 10.6 ml with endoscopic coblation adenoidectomy. The grading of pain was significantly lower in endoscopic assisted coblation adenoidectomy. There was no significant difference between two groups in terms of eustachian tube function after surgery.

CONCLUSIONS

Coblation adenoidectomy has significant advantages over conventional adenoidectomy in terms of completeness of removal, reduced blood loss, and lower post-operative pain grade.

KEYWORDS

Coblation, Adenoidectomy, Curettage, Haemorrhage and Complications

Corresponding Author:
Dr. Shahul Hameed A.,
Additional Professor,
Department of ENT,
Government Medical College,
Calicut, Kerala, India.
E-mail: shahulpni61@gmail.com

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BACKGROUND

Adenoidectomy is one of the most commonly performed paediatric surgical procedure. It is either done as a single procedure or combined with either tonsillectomy or grommet insertion. In the recent times, various methods of adenoidectomy are described and being practiced (e.g. micro-debrider, Bovie, bipolar coagulation, stripping under endoscopic control, coblation).[1,2,3] One among them is coblation method with the use of endoscopes for the removal of the adenoids with less operative time, blood loss, post-operative morbidity, and/or recurrence.[4] The widely used conventional cold curette adenoidectomy (CCA) was first described in 1885.[5] 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.[6] Adenoids are aggregated sub epithelial lymphoid tissue in the postero-superior wall of nasopharynx and is a part of Waldeyer's ring.

Though adenoid enlargement is physiologically normal in children, the resulting airway obstruction is troublesome and they can present with distressing symptoms.[7] Adenoid hypertrophy leads to nasal obstruction, resulting in mouth breathing and its sequelae, voice changes, snoring, obstructive sleep apnoea, feeding difficulties, facial deformities, recurrent upper respiratory tract infections, eustachian tube dysfunction, ear infection and deafness.[8] In such situations, surgical removal of the adenoid tissue is absolutely indicated. Adenoidectomy is one of the commonly performed surgical procedure in children.[9] Ideal adenoidectomy should achieve a safe and complete removal of the adenoids with minimum operation time and less blood loss without any post-operative morbidity and recurrence.[10] Conventional curettage adenoidectomy is the widely used procedure. In conventional adenoidectomy, adenoid is curetted with an adenoid curette transorally. The risk of this technique lies in the possibility of incomplete removal, eustachian tube and nasopharyngeal injury due to lack of direct view of nasopharynx.[11]

There was advancement in surgical techniques developed in the field of ENT. Among the many one, new development was the newer surgical methods for adenoidectomy to reduce the morbidity and surgical risk. The use of endoscopes along with newer surgical techniques has been gained popularity in the recent years. One such combination is the endoscopic coblation procedure.[12] Coblation is a new technology that uses radiofrequency energy with saline solution to remove adenoid tissue. It works at relatively low temperature to gently dissolve and/or reduce target tissue with less thermal damage to surrounding healthy tissue. Coblation technology enables ablation, resection and coagulation of soft tissue and haemostasis of blood vessels in one convenient surgical device.[13] The present study was conducted to compare the efficacy of endoscopic coblation adenoidectomy with regular curettage adenoidectomy.

Aims of the Study

The aim of this study was to compare the efficacy and safety of endoscopic oblation adenoidectomy with the regular curettage adenoidectomy. The technique will be compared on the basis of:

Primary outcome: 1. Completeness of removal;

Secondary outcome:

1. Intra-operative blood loss. 2. Operation duration. 3. Postoperative pain. 4. Eustachian tube functions after surgery by using tympanometry.

METHODS

This is a prospective comparative study conducted on patients attending ENT out-patient department (OPD) with a clinical diagnosis of adenoid hypertrophy from February 2019 to July 2020.

Sample Size

The sample size was 50 patients who underwent adenoidectomy during the study period. Group A consisted of 25 patients who underwent coblation adenoidectomy and group B consisted of 25 patients who underwent regular curettage adenoidectomy.

Inclusion Criteria

1. Patients aged between 3 and 10 years with symptoms of adenoid hypertrophy.
2. Patients with confirmation of adenoid hypertrophy on radiological investigations and/or diagnostic nasal endoscopy

Exclusion Criteria

1. Patients aged less than 3 years and greater than 10 years.
2. Patients with previous history of surgery for adenoid.
3. Patients with bleeding disorders.
4. Patients with cleft palate and/or previous history of cleft palate repair.
5. Patients with neuromuscular or craniofacial anomalies.
6. Down's syndrome patients.

Methodology

After obtaining institutional ethical committee approval, patients attending the ENT OPD with symptoms of adenoid hypertrophy were selected. They were then subjected to radiological investigation and diagnostic nasal endoscopy for the confirmation of adenoid hypertrophy. Patients who underwent adenoidectomy were divided into 2 groups of 25 each, undergoing coblation (Group A) and conventional curettage adenoidectomy (Group B) after assessing for inclusion and exclusion criteria and getting informed written consent. X-ray nasopharynx lateral view was taken to confirm adenoid hypertrophy. Diagnostic nasal endoscopy was done pre-operatively for grading the

adenoid enlargement. Pre-operative tympanogram was taken to assess pre-operative eustachian tube function. Duration of surgery and intra-operative blood loss were noted. Post-operative pain was assessed on first and second post-operative days as mild, moderate and severe. All patients were followed up for 3 months and any complications if any were recorded. Post-operative tympanogram was taken at the end of three months for the evaluation of outcome of these two types of surgical techniques. Post-operative diagnostic nasal endoscopy and/or X-ray nasopharynx lateral view was done at the end of three months to look for residual adenoid tissue.

Preoperative Evaluation

Patients were assessed on X-ray skull for the enlargement of adenoid tissue prior to surgery. A DNE examination was done to assess the grading of the adenoid enlargement. The Clemens and McMurray scale was used to grade the adenoid mass. Grade 1: adenoid tissue filling 1/3 of the vertical height of choana. Grade 2: adenoid tissue filling up to 2/3 of the vertical height of choana. Grade 3: adenoid tissue filling 2/3 to nearly all but not complete filling of the choana. Grade 4: complete choanal obstruction

Surgical Techniques

Conventional Curettage Adenoidectomy

Under general anaesthesia (G.A.) and intubation, patient was kept in rose position. Boyle Davis mouth gag was applied to keep the mouth open. Palpation of adenoid mass was done with gloved finger to find its extension. The adenoid mass was curetted using St. Clair Thompson adenoid curette with cage. This was followed by curettage with adenoid curette without cage to remove remaining tissue. Completeness of removal was judged by palpation. Bleeding was controlled by ribbon gauze soaked in saline to create pressure in the nasopharynx. The total time of the operative procedure was recorded: starting from the time the Boyle Davis mouth gag was applied to the time when bleeding has stopped (Fig 1, 2 and 3). Amount of blood loss was assessed by measuring the blood collected in the suction apparatus. During the post operative period, the pain was assessed using visual analogue score till the patient was discharged.

Figure 1. Rose Position

Figure 2. Curettage Adenoidectomy

Figure 3. Adenoid Tissue after Removal

Endoscopic Coblation Adenoidectomy

Under G.A. with intubation and with the patient in supine position, Boyle Davis mouth gag was applied. Nasopharynx was visualized using 70 degree Hopkins rod endoscope. The coblation PROCISE MAX wand was used for coblating the adenoid tissue. The adenoid mass coablated was much better visualized with the endoscope and the remnants were minimal; the intra-operative bleeding was also judged for a better method (Fig 4, 5 and 6). As this method uses suction and irrigation with saline gives clear surgical field. As this system has an advantage of suction, the area of surgery is better judged during and after the surgery. The time taken for the procedure and intra-operative blood loss were calculated in the same method as above. Pain was also assessed with visual analogue scale (VAS) score.

Figure 4. Coblation Adenoid Wand

Figure 5. Endoscopic Coblation Adenoidectomy

Figure 6. At the End of the Procedure

The Comparison of the Two Groups was done on the Basis of:

1. Completeness of Removal

Clemens and McMurray scale of adenoid grading was used both pre-operatively and post-operatively (after 3 months) with the help of DNE, were graded. A comparison was made between the two methods in terms of tissue left over.

2. Intra-operative Blood Loss

Intra-operative blood loss was calculated by measuring the blood collected in the suction jar in ml.

3. Operative Duration

The duration of surgery was calculated from the time the Boyle Davis mouth gag was applied till the time adequate haemostasis was secured.

4. Post-operative Pain

Post-operative pain was analysed using the visual analogue scale and the scores were observed till the patient is discharged. The VAS score on the day of surgery was taken into consideration.

5. Eustachian Tube Function fter Surgery

Post-operative tympanogram was done after three months to assess eustachian tube function.

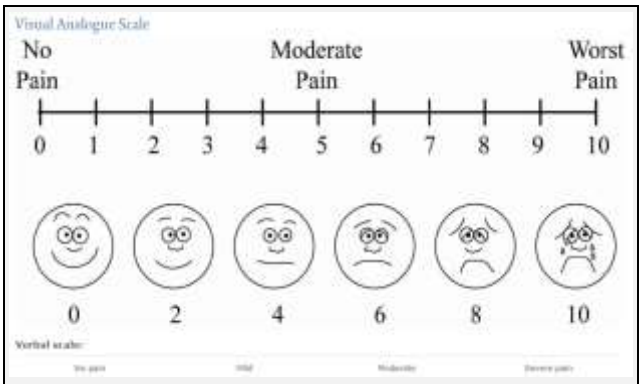

Figure 7. Visual Analogue Scale

Statistical Analysis

Data obtained were entered in MS Excel spread sheet and analysed using Statistical Package for Social Sciences (SPSS) 18 version software. Results were expressed by chi square test and were used for comparison.

P value < 0.05 was taken as significance.

RESULTS

A total of 50 patients were evaluated. Patients in group A underwent adenoidectomy by coblation method. Those in group B underwent adenoidectomy by the conventional curettage method.

Age, Gender and Adenoid Grading Distribution

The patients included in the present study were between 3 and 10 years of age. The mean age and SD in group A was 6.6 ± 1.58 and in group B was 6.16 ± 1.72. The youngest in group A and B was 4 years of age. The eldest in group A and B was 9 years. Age characteristics are given in Table 1. The gender distribution was as follows: 13 male children were included in group A and 15 male children in group B. Group A had 12 female children and group B had 10 female children. Gender characteristics are given in table 1. 3 patients in group A and 2 patients in group B had grade 1. Grade 2 was seen in 17 patients of group A and 18 patients of group B. 5 patients of group A and 5 patients of group B presents with grade 3. Thus, 12 % of group A and 8 % of group B had grade 1, 68 % of group A and 72 % of group B had grade 2, 20 % of group A and 20 % of group B had grade 3. This analysis was given in table 1.

Observation	Group A	Percentage	Group B	Percentage
Mean Age and SD	6.6 ± 1.58		6.16 ± 1.72	
Gender				
Male	13	52	15	60
Female	12	48	10	40
Adenoid Grading				
Grade 1	03	12	02	08
Grade 2	17	68	18	72
Grade 3	05	20	05	20

Table 1. Age Characteristics.*All the Values are Expressed in Mean ± SD; SD: (Standard Deviation), (n - group A - 25 and Group - B - 25)

Pre-operative Tympanogram

Tympanometry was done for all patients preoperatively. Type A tympanogram was seen in 12 patients of group A and 10 patients of group B. 13 patients of group A and 15 patients of group B had type B tympanogram preoperatively. This is shown in table 2.

Observation	Group A	%	Group B	%
Preoperative tympanogram				
A type	12	48	10	40
B type	13	52	15	60

Table 2. Preoperative Tympanogram Results in the Both Groups (n-group a - 25 and group - b - 25)

Intra-Operative Blood Loss, Duration of Operation

In the coblation group, 19 out of 25 patients had a blood loss of less than 10 ml contributing to 76 %. 6 out of the 25 patients had a blood loss in the range of 11 - 20 ml contributing to 24 %. In the conventional group, none of the patients had a blood loss of less than 10 ml. 4 % of the 25 patients had blood loss in the range of 11 - 20 ml. About 21 -30 ml was the range of blood loss in 52 % of patients. 44 % of the patients had blood loss between 31 – 40 ml which is illustrated in table 9, 10 and 11 and Chart 5 and 6. The mean and SD were 10.6 ± 4.16 and 30.36 ± 6.32 in groups A and B respectively which is given in table 3. The P value is less than 0.05. The time taken for the surgical procedure was calculated in both the groups. The time taken for the operative procedure was calculated from the time the Boyle Davis mouth gag was inserted until the time adequate haemostasis was achieved. In the coblation group, 4 % of patients had time duration in the range of 5 - 10 minutes, 76 % in the range of 11 - 15 minutes and 20 % in the range of 16 - 20 minutes. In the conventional group, 64 % had time duration in the range of 5 – 10 minutes, 36 % in the range of 11 - 15 minutes. The operative duration is illustrated in detail in table 3. The mean operative duration was group A was 14.4 ± 2.58 and 9.44 ± 3.56 in group B with a p value of less than 0.05 which is given in table 3.

Observation	Group A	%	Group B	%
Blood loss (ml)				
0 - 10	19	76	00	00
11 - 20	06	24	01	04
21 - 30	00	00	13	52
31 - 40	00	00	11	44
Mean blood loss (ML)	10.6 ± 4.16	P value - < 0.05	30.36 ± 6.32	--
Duration of operation				
5 - 10	01	04	16	64
11 - 15	19	76	09	36
16 - 20	05	20	00	00
Mean duration of operation and SD	14.4 ± 2.58	P value - < 0.05	9.44 ± 3.56	P < 0.05

Table 3. Intra-operative Blood Loss, Mean Blood Loss and Duration of Operation with Mean Duration of Operation in Both Groups, (n-group A - 25 and Group - B -25).

Post-Operative Pain

The post-operative pain score on day 0, i.e. the day of surgery was taken into consideration for comparison between the two groups. 84 % of patients in the coblation group had a pain core of 3. While 80 % of patients in the conventional adenoidectomy group had a pain score of 4. One patient in group B had a pain score of 5 on the day of surgery.

This is illustrated in table 4.

Observation	Group A	%	Group B	%
Pain score				
Vas score 1	00	00	00	00
Vas score 2	00	00	00	00
Vas score 3	21	84	04	16
Vas score 4	04	16	20	80
Vas score 5	00	00	01	04

Table 4. Post-operative VAS Score in Both Groups, (n - group A - 25 and Group - B - 25)

Completeness of Removal and Post-Operative Tympanogram

After a follow up of three months period, the adenoid grading was done under endoscopy and observed that 19 patients in group A had their adenoids removed completely. 3 patients in group A showed partial remnants (grade 2 or grade 3). Whereas in group B, 5 patients showed complete removal of adenoids. 20 patients in group B showed partial removal of adenoid tissue. On comparison, coblation adenoidectomy showed a greater percentage of complete removal of adenoid tissue with P value less than 0.05 which was shown in table 5. Post-operative tympanometry was done at the end of 3 months after the surgery to assess the eustachian tube function. All the patients in group A had type A tympanogram after the surgery and only 2 patients in group B had type B tympanogram post-operatively. P value was 0.149. This was shown in table 5.

Observation	Group A	%	Group B	%	P Value
Completeness of Removal					
Complete	19	76	05	20	
Partial	06	20	20	80	P<0.05
Post-operative Tympanogram					
Type A	25	100	23	92	
Type B	00	00	02	08	P- 0.149

Table 5. Completeness of Removal of Adenoid Mass in Both the Groups; (n - group A - 25 and Group - B - 25)

DISCUSSION

Adenoidectomy is one of the commonly performed surgeries in children.[1] Various techniques have been proposed in order to reduce the amount of bleeding during the procedure and to facilitate the easy and safe removal of adenoid tissue. Adenoidectomy can be done using an adenoid curette, bipolar cautery, power assisted micro debrider and the coblator. Though there are many options, emphasis should be laid on the efficacy technique and the postoperative outcome. In spite of the numerous options available, it has been noted that the recurrence rates following adenoidectomy are very high.[14] These are attributed to certain factors like difficult access of adenoids and the non-visualization of adenoids during removal. The use of an endoscope during adenoidectomy has the advantage of visualizing the adenoid tissue as well as the surrounding structures. Direct visualization enables a better removal of the whole adenoid tissue without injuring other structures in the vicinity. Coblation is a non-heat driven process of soft tissue dissolution using bipolar radiofrequency energy under a conductive medium like normal saline.[15] Plasma not only has the physical effects of cutting and coagulation but it also decontaminates the surgical wound thereby facilitating better wound healing. This non thermal dissolution technique produces very minimal bleeding.[16] The entire nasopharynx could be accessed with the help of the wand and the endoscope making it easy to curette the adenoid mass. This method also ensures complete removal of adenoid mass with no injury to the surrounding structures with good control over

bleeding.[17] This in turn decreases the post-operative pain hence facilitating earlier recovery.

However the disadvantages of coblation technique include a longer learning curve which requires considerable skill and expertise, increased duration of coblation technique due to various factors and the cost factor of the equipment.[18] Results of our study was similar to the study conducted by Di Riezo Businco et al.[9] from his study of 40 children aged between 04 to 16 years, undergoing adenoidectomy; the variables were pain score on the first day, number of days reported with pain requiring analgesia, days of absenteeism, adenoid grade by endoscopic evaluation and intra-operative blood loss. The results showed that the regular method of adenoidectomy showed more patients with remnants of adenoid tissue. Endoscopic coblation adenoidectomy was a technique considered to ensure complete removal of adenoids and was also safer as it was done under endoscopic control.[19] In our study, 76 % of coblation adenoidectomy group shows complete removal with P value less than 0.05. In our study, coblation group was superior to conventional curettage group in terms of intra-operative blood loss. 76 % of coblation groups have intra-operative blood loss in the range of 0 - 10 ml. This was similar to the study conducted by Wong L, Moxham JP, Ludemann JP studied in children who were classified into 3 groups.[20] The techniques employed were power assisted adenoidectomy with cauterization-micro debrider with electrocautery for haemostasis, power assisted adenoidectomy without cauterization – micro debrider with just packing for haemostasis. This prospective multicentric study demonstrated that coblation adenoidectomy was superior to micro debrider adenoidectomy with regards to the amount of intra-operative bleeding.[11] In our study, 64 % of conventional curettage group has operation duration in the range of 5 - 10 minutes whereas 76 % of coblation group has operation duration in the range of 11 - 15 minutes. Mahmut Ozkiris et al.[11] studied 60 consecutive patients in the age group of 4 - 8 years undergoing adenoidectomy; divided in two groups similar to this study. The variables compared were intra-operative blood loss, operative time. They found that coblation method gave better accessibility and lesser bleeding. But the operation time was prolonged.[21] Pagella F, Pusateri A, Canzi P et al. conducted a similar study and opined that blood loss was found to be more in the regular adenoidectomy group, similar to our study in which 52 % of regular adenoidectomy children had blood loss in the range of 21 -30 ml. Nina L. Shapiro et al.[15] compared cold dissection with coblation assisted adeno-tonsillectomy in a prospective randomized study of paediatric patients aged 2 - 16 years. Intra-operative parameters measured were surgical duration and intra-operative blood loss. Post-operative parameters measured were daily pain rating using Wong-Baker FACES pain scale, days of use of pain medication, days to return to normal diet. Post-operative complications were also included. Operative duration was shorter in the coblation group (11.2 min vs 17.0 min) ($P < 0.001$). Our study shows a mean operative duration of 9.44 minutes in coblation group and 14.4 minutes in conventional group. Similar to our study, intra-operative blood loss was lower in the coblation group with p value less than 0.05. Whereas no significant difference was reported in the post-operative pain scores analysed daily and both the groups returned to normal activity on similar post-operative days.[22] But in our study, 86 % of coblation group had VAS pain score of 3 and 80 % of conventional group was having VAS pain score of 4.[23] Costantini F, Salamanca F, Amaina T et al.[24] compared endoscopic assisted adenoidectomy with curettage adenoidectomy in 38 patients in the age group of 8 - 12 years in their study. The variables used were mid-sagittal reformatted images of computed tomography of temporal bone, blood loss and operative time. They found that CT temporal bone adenoid thickness divided by DNE adenoid mass revealed a mean ratio of 0.41 in the regular curettage group and 0.30 in the endoscopic adenoid group. Hence, they concluded that endoscopic adenoidectomy was superior to curettage adenoidectomy. In our study, post-operative grading of adenoids was done at the end of 3 month post-surgery. Only 20 % in the conventional group showed complete removal of adenoids whereas 76 % in the endoscopic coblation group showed complete removal of adenoids ($P < 0.05$) showing the superiority of endoscopic assisted coblation adenoidectomy compared to conventional curettage adenoidectomy in terms of completeness of removal.[25] The results of our study with respect to removal of adenoid tissue were similar to a study done by Ismail Elnashar and colleagues.[26] They studied the effectiveness of endoscopic assisted adenoidectomy by measuring the volume of adenoid tissue removed after blind curettage and endoscopy assisted adenoidectomy. The volume of adenoid removed by curettage adenoidectomy ranged from 1 to 3.6 ml with a mean of 2.45 ml. The volume of adenoid tissue removed post curettage adenoidectomy ranged from 0 - 2.9 ml (mean 0.67 ± 0.58 ml). They concluded that conventional curettage adenoidectomy left a substantial volume of adenoid tissue showing the advantage of endoscopic assisted adenoidectomy over curettage technique similar to our study in which 80 % of conventional group has only partial removal of adenoid tissue. Havas T, Lowinger D and colleagues[27] compared curettage adenoidectomy with coblation adenoidectomy in 54 children. They divided the children into two groups, the coblation group and the control/cold curettage group. The parameters compared were the operative time, intra-operative bleeding, postoperative pain scale, post-operative pain duration and cure rates. They demonstrated that the coblation group showed increased operative time, less intra-operative bleeding with less post-operative pain with a shorter duration of post-operative pain. Our results were similar to this study. The mean operative duration was less for conventional technique ($p < 0.05$) showing an increased intra-operative duration with the coblation group with a mean operative duration of 14.4. The mean intra-operative bleeding was 10.6 for coblation group compared to 30.36 of conventional group with P value less than 0.05. The median VAS score in group A was less for coblation group ($p < 0.05$) indicating lesser post-operative pain in coblation group compared with the conventional group which is

comparable to our study. Datta R, Singh V, Deshpal.[28] used operative time and intra-operative blood loss as primary outcomes. They found that regular adenoidectomy group showed less operative time whereas the coblation group showed less intra-operative blood loss, less post-operative bleeding and adenoid recurrence. In our study, coblation group is superior in terms of post operative pain; 84 % shows VAS pain score of 3 in the post-operative period. The results of our study were similar to the above study by Datta R, Singh V, Deshpal with the coblation group showing less intra-operative blood loss and superior completeness of removal but with a longer operative time. Liyun yang and colleagues[29] conducted a meta-analysis comparing endoscopic assisted coblation adenoidectomy and conventional curettage adenoidectomy. The parameters compared were operative effectiveness, total operative time, blood loss and complications. They found that the endoscopic method could be done in a shorter operative time (SMD -1.09, 95 %CI - 1.29 - .90. P < 0.00001) with less blood loss (SMD - 19.74, 95 % CI - 22.75 - 16.73, P < 0.00001) and fewer complications (0.15, 95 % CI, 0.07- 0.35), P < 0.00001. The mean and standard deviation of operation duration in our study was 9.44 ± 3.56 in conventional group and 14.4 ± 2.58 in coblation group. The results of this study were similar to the above study with regards to less intra-operative blood loss and fewer complications in the coblation group. Michael S Timms and colleagues[30] compared the use of coblator with the conventional and other newer methods of adenoidectomy. They concluded that coblator use showed a relatively blood less field with precision of tissue removal and less damage to the surrounding structures which was similar to the results of our study in which mean and standard deviation of blood loss in coblation group was 10.6 ± 4.16 and 30.36 ± 6.32 in conventional group. The results of our study were similar to the study conducted by Das AT, Prakash SB, Priyadarshini V[31] to evaluate the results of conventional curettage adenoidectomy by post-operative endoscopic evaluation of the nasopharynx. The results were very similar to this study. In the present study with regular adenoidectomy method, the remnant adenoid tissues were seen in the supero-medial part of choanae, eustachian tube opening, nasopharyngeal roof and fossa of Rosenmuller. But with endoscopy assisted adenoidectomy, the remnants were minimal. Hence the study concluded that endoscopy assisted adenoidectomy fared better over the curettage technique. A fear of injuring the associated structures may itself be the cause for a partial or an incomplete removal in case of the traditional method. Whereas the use of an endoscope offers a good visualization of the entire nasopharynx and hence careful removal can be done upon visualization. Secondly on considering the blood lost during the procedure, the coblation technique proves to be superior to the conventional method. The plasma released as a result of passage of electric current through the conducting fluid breaks down the molecular bonds causing disintegration of tissue molecule by molecule. This technique produces negligible amount of bleeding. Similarly, the coblation method showed lesser post-operative pain score and hence the patients in this group recovered early.

CONCLUSIONS

The endoscopic assisted coblation adenoidectomy is superior to the conventional method in terms of-

1. Completeness of adenoid removal.
2. Less intra-operative blood loss.
3. Less post-operative pain.

However, it is more time consuming when compared to the conventional adenoidectomy method. There is no significant difference between these two groups in terms of eustachian tube function after surgery.

Limitations of the Study

1. The improvement of symptoms following the procedures was not compared post-operatively which can make a significant contribution while comparing the efficacy of the two techniques.
2. Though the completeness of removal was assessed endoscopically after 3 month in the post-operative period, the patient was not followed up further for parameters such as recurrence and post-operative haemorrhage (secondary/reactionary).
3. The post-operative pain score was assessed by VAS score which can cause judgmental bias due to subjective assessment.
4. Lastly, the surgeon's skill may be a potential confounding factor while comparing the two techniques.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.
Financial or other competing interests: None.
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