



ORIGINAL RESEARCH PAPER

ENT

LEARNING CURVE IN COBLATION ADENOIDECTOMY

KEY WORDS: Coblation, adenoid hypertrophy, adenoidectomy

Dr. Gaurav Khandelwal

(MS,DNB) Associate Professor FH medical college, Etmadpur, Agra

Dr. Shobhit Gupta*

(MS) Assistant Professor FH medical college, Etmadpur, Agra
*Corresponding Author

ABSTRACT

This retrospective study was carried out over 50 patients of adenoid hypertrophy. In all such patients, coblation assisted adenoidectomy was performed. In our study, we compared our results of first 10 coblation assisted adenoidectomy with that of last 10 adenoidectomies. The parameter taken into consideration for comparison is intra-operative bleeding which is the most significant factor in adenoidectomy. In this study, we saw that in last 10 adenoidectomies, there is significant decrease in intra-operative bleeding. In this study, we are sharing our experience how coblation adenoidectomy can be efficient when surgeon become familiar with this technique of adenoidectomy.

BACKGROUND-

The adenoids are a mass of lymphoid tissues located in the supero-posterior area of the nasopharynx and affect breathing in the upper airway. It is known that, in general, the adenoids are tiny in size at birth and consistently grow during several years after birth due to the hyperactivity of the immune system. Adenoid hypertrophy can lead to various symptoms such as nasal obstruction, mouth breathing, snoring, and speech abnormalities. It has also been known to be a risk factor for otitis media, dento-facial abnormality and obstructive sleep apnea syndrome.¹ Therefore, if the enlarged adenoids cause a variety of problems, surgical removal of the adenoids are generally required and adenoidectomy is one of the most commonly performed surgical treatment in the field of pediatric otorhinolaryngology.² As with any other surgical procedure there are complications associated with adenoidectomy. These complications are fortunately rare.³

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.² The ideal adenoidectomy procedure should achieve a safe 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 Post adenoidectomy 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.

Various methods of performing adenoidectomy include:

1. Conventional cold steel technique using curette
2. Bipolar coagulation under endoscopic vision
3. Adenoidectomy using microdebrider⁵
4. Coblation adenoidectomy

For purposes of classification and management adenoid hypertrophy has been graded according to the size of the tissue taking into consideration the relationship of the hypertrophied tissue with vomer, soft palate and torus tubaris.⁷

| Grade | Anatomical structure in contact with adenoid tissue |
|-----------|---|
| Grade I | None |
| Grade II | Torus tubariss |
| Grade III | Torus tubaris, Vomer |
| Grade IV | Torus tubaris, Vomer and soft palate at rest |

There have been several comparative studies among these adenoidectomy techniques.⁸⁻¹³ The coblation technique has advantages in that the surgical wand can work for ablation, coagulation, saline irrigation and suction at the same time.¹⁴ The main advantages observed with coblation adenoidectomy are:

- i. The lack of bleeding (abundant bleeding with cold curettage).
- ii. Provides a direct endoscopic view of the adenoid (blind surgery or mirror view with traditional cold curettage).
- iii. The ability to reach all the areas of the rhinopharynx up to the eustachian tube opening (the cranial part of the rhinopharynx cannot be reached with curettage).
- iv. Lower risk of residual adenoid tissue after coblator surgery.
- v. Fewer complications (no cutting blade with coblation adenoidectomy).
- vi. It is suitable for patients of all ages, although the decrease of pain intensity and duration is important in paediatric patients.
- vii. A reduction in the use of post-operative drug and loss of working days for parents due to faster post-surgical healing (as shown by the days reporting pain, analgesic days, liquid diet days, absent from school days).

MATERIAL AND METHODS-

This retrospective study was carried out over 50 patients of adenoid hypertrophy during the period of 18 months (May 2017 to Oct2018) in department of ENT, FH medical college (Tundla, Agra). In all such patients, coblation assisted adenoidectomy was performed. In our study, we compared our results of first 10 coblation assisted adenoidectomy with that of last 10 adenoidectomies.

Inclusion criteria-

- (1) Age- 5 to 10 years.
- (2) Patients having signs and symptoms of adenoid hypertrophy like chronic nasal obstruction and discharge, chronic bilateral ear discharge, adenoid facies.
- (3) Haemoglobin > 10 gm%

Exclusion criteria-

- (1) Patient with bleeding disorders and other debilitating diseases.

- (2) Patients with nasal allergy, and/or acute upper respiratory tract infections.
- (3) Patients with neuromuscular disorders or craniofacial anomalies.
- (4) Previously underwent adenoidectomy.
- (5) Could not complete postoperative follow up.

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. Surgical team remains same in all cases including surgeon and anesthesiologist.

Surgical technique-

For coblation adenoidectomy (CA), a coblator EVAC 70 wand (smith-nephew) was used. Coblation is a controlled, non-heat driven, plasma-mediated radiofrequency-based ablation to dissolve enlarged adenoid tissues.¹⁴ Under general anaesthesia, CA was performed using an endoscopy by trans-oral approach.

The procedure was performed under general anaesthesia with oro-tracheal intubation. The patient was kept in Trendelenburg position, with the head approximately 15° below horizontal so as to prevent the flow of saline from the coblation wand towards the laryngeal airway. The mouth was opened using a Boyle Davis mouth gag. Red rubber tubes were passed through both the nostrils and brought out through the mouth to elevate the soft palate. A 4 mm, 70° Hopkins rigid endoscope was passed through the mouth for visualisation of the adenoids. The EVac® 70 XTRA HP Coblation Wand (smith-nephew) was bent to reach the higher level of nasopharynx through the oral cavity if required. The adenoid tissue was removed in layers from anterior to posterior, using the coblation wand. Each layer was removed, starting from its inferior most point and moving superiorly. The limits of adenoidectomy were defined as follows: superiorly till the periosteum over the body of sphenoid; posteriorly till the pharyngobasilar fascia laterally till the fossa of Rosenmuller in the posterior part and the torus tubarius in the anterior part; and inferiorly till the Passavant's ridge. Haemostasis was achieved using the coblation wand. No nasopharyngeal packing was required at the end of the procedure in any case.

RESULTS-

(1) **Sex distribution:-** we selected male and female patient randomly. In our study, there are 28 male patients and 22 female patients.

| S.NO. | Sex | No. of Patients | Percentage% |
|-------|--------|-----------------|-------------|
| 1 | Male | 28 | 56 |
| 2 | Female | 22 | 44 |

(2)**Patient distribution-** In our study, most of the patients having grade IV adenoids.

| Grade | Patients(n=50) | |
|-----------|----------------|--|
| Grade I | 0 | |
| Grade II | 3 | |
| Grade III | 16 | |
| Grade IV | 31 | |

| Grade | First 10 patients(1-10) | Last 10 patients(41-50) |
|-----------|-------------------------|-------------------------|
| Grade I | 0 | 0 |
| Grade II | 2 | 0 |
| Grade III | 3 | 3 |
| Grade IV | 5 | 7 |

(3)**Amount of Blood loss-** (i) We found that in initial 10 cases, the average blood loss is 31.8+/-7.5ml.

| S. No | Bleeding in ml |
|-------|----------------|
| 1 | 38 |

| | |
|----|----|
| 2 | 43 |
| 3 | 31 |
| 4 | 45 |
| 5 | 28 |
| 6 | 30 |
| 7 | 25 |
| 8 | 32 |
| 9 | 24 |
| 10 | 22 |

Average 31.8 +/- 7.5ml

(ii) In last 10 cases, the average blood loss is 14.3+/-3.9ml. We saw that intra-operative bleeding decreased significantly in last 10 cases. T test was applied to the study and the difference was found significant (t=6.159.)

| S. No | Bleeding in ml |
|-------|----------------|
| 41 | 15 |
| 42 | 12 |
| 43 | 10 |
| 44 | 17 |
| 45 | 22 |
| 46 | 15 |
| 47 | 12 |
| 48 | 10 |
| 49 | 12 |
| 50 | 18 |

Average: 14.3 +/- 3.9ml

DISCUSSION-

This is a first kind of study which compares our own case series in order to understand the learning curve in coblation. Learning curve in coblation is because, in this we have to reach very close to the tissue and not touch it but we as surgeons are usually trained to touch the tissue. So when we start doing surgeries we tend to touch the tissue, in that case, it works as a bipolar cautery and not as coblation. Coblation creates plasma which should ablate the tissue and the electrode should not touch the tissue. When we start doing surgeries with coblation initially the bleeding was more because we tend to touch the tissue, so tissue gets stuck in the coblation wand and causes clogging of wand. It requires frequent cleaning of wand and during this time bleeding occurs. But after some time when surgeon becomes well versed with coblation technique, there is less clogging of wand and less intra-operative bleeding.

We compared our study conducted by Thiagrajan B etal.¹⁵ They found in their study, the average amount of blood loss in coblation adenoidectomy was 20ml while in our study the average blood loss in first 10 initial cases was 31.8+/-7.5ml and last 10 cases was 14.3+/-3.9ml which is quite comparable.

The present results demonstrate the ability of endoscopic coblation adenoidectomy to ensure complete and safe removal of adenoid tissue, due to endoscopic control and the small wand tip, which is able to reach the most cranial part of adenoid and the adenoid intranasal extension (impossible to access with the Beckmann curette). Another benefit of coblation adenoidectomy is the ability to use a single instrument to ablate and coagulate tissue, with significant improvement of patient recovery compared to cold curettage. The main disadvantage of an endoscopic technique compared with traditional cold curettage is the need to have a complete set-up for paediatric endoscopy in the operating theatre and the time for its preparation.

Another study conducted by Jeong-Whun Kim etal. showed that coblation technique had significant advantages with regard to mean intra-operative blood loss and nasal mucociliary clearance rate.¹³ Although coblation adenoid

ectomy has advantages such as short operation time and low amount of intra-operative hemorrhage, it also has a disadvantage in cost due to higher price of coblation wands compared to micro-debrider blades. Thus, when coblation adenoidectomy was selected among various surgical techniques, these advantages and disadvantages should be considered.

CONCLUSION-

Even though the power-assisted technique is the most commonly used for adenoidectomy, use of the coblation technique is also increasing because it is known to be advantageous in that the device has multiple function including ablation, coagulation, suction and saline irrigation. The shorter duration of procedure and less intra-operative bleeding with coblation adenoidectomy are associated with its basic principle of device operation. The coblation technique allows not only vaporization of the adenoid tissues but also blood coagulation at the same time. Therefore, the coblation technique does not require a separate coagulation process and provides a clear surgical field minimizing bleeding.

In our study, we saw that as the experience of surgeon increases with coblation, the result of coblation adenoidectomy improves in terms of less intra-operative bleeding and less post op morbidity. We suggest all ENT surgeons must be familiar with this technique of adenoidectomy.

REFERENCES-

1. Kavanagh KT, Beckford NS. Adenotonsillectomy in children: indications and contraindications. *South Med J*. 1988; 81:507-514.
2. Darrow DH, Siemens C. Indications for tonsillectomy and adenoidectomy. *Laryngoscope*. 2002; 112:6-10.
3. Regmi D, Mathur NN, Bhattarai M. Rigid endoscopic evaluation of conventional curettage adenoidectomy. *J Laryngol Otol* 2011; 125:53-8.
4. Shapiro NL, Bhattacharyya N. Cold dissection versus coblation-assisted adenotonsillectomy in children. *Laryngoscope* 2007; 117(3):406-410.
5. Thornval A. Wilhelm Meyer and the adenoids. *Arch Otolaryngol* 1969; 90(3):383-386.
6. Somani SS, Naik CS, Bangad CV. Endoscopic adenoidectomy with microdebrider. *Indian J Otolaryngol Head Neck Surg* 2010; 62:427-431.
7. Sanjay R. Parikh, MD, Mark Coronel, MD, James J. Lee, MD, and Seth M. Brown, MD. Validation of a new grading system for endoscopic examination of adenoid hypertrophy. *New York Otolaryngology-Head and Neck Surgery* (2006) 135, 684-687.
8. Walker P. Pediatric adenoidectomy under vision using suction-diathermy ablation. *Laryngoscope*. 2001; 111:2173-2177.
9. Jonas NE, Sayed R, Prescott CA. Prospective, randomized, single-blind, controlled study to compare two methods of performing adenoidectomy. *Int J Pediatr Otorhinolaryngol*. 2007; 71: 1555-1562.
10. Öztürk Ö, Polat . Comparison of transoral power-assisted endoscopic adenoidectomy to curettage adenoidectomy. *Adv Ther*. 2012; 29: 708-721.
11. Murray N, Fitzpatrick P, Guarisco JL. Powered partial adenoidectomy. *Arch Otolaryngol Head Neck Surg*. 2002; 128: 792-796.
12. Di Rienzo Businco L, Angelone AM, Mattei A, Ventura L, Lauriello M. Paediatric adenoidectomy: endoscopic coblation technique compared to cold curettage. *Acta Otorhinolaryngol Ital*. 2012; 32: 124-129.
13. Özkiriş M, Karaçavuş S, Kapusuz Z, Saydam L. Comparison of two different adenoidectomy techniques with special emphasize on postoperative nasal mucociliary clearance rates: coblation technique vs. cold curettage. *Int J Pediatr Otorhinolaryngol*. 2013; 77:389-393.
14. Benninger M, Walner D. Coblation: improving outcomes for children following adenotonsillectomy. *Clin Cornerstone*. 2007; 9 Suppl 1: S13-23.
15. Thiagarajan B, Nair V B. Coblation adenoidectomy our experience. *Otolaryngol online* Volume 4 Issue 1.5 2014.