

## Coblation Versus Conventional Tonsillectomy: Our Institutional Experience

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### Abstract

**Introduction:** Tonsillectomy is a very common operation and is performed using various surgical methods. Coblation is a popular method because it causes less pain than other surgical methods. However, the superiority of coblation is unproven.

**Objective:** To compare the effect of coblation Tonsillectomy for chronic tonsillitis or Tonsillar hypertrophy with conventional method of Tonsillectomy on intraoperative morbidity; postoperative morbidity and Procedural cost.

**Methods:** It is Prospective double blinded randomized controlled trial done at civil hospital Ahmedabad for period of 1<sup>st</sup> November 2018 to 1<sup>st</sup> November 2019 on operation time, intraoperative blood loss, postoperative pain, time needed to regain the normal diet and activity and postoperative hemorrhage were gathered and compared between two groups containing 27 patients in each group. Method of surgery depends on parents or patients choice.

**Results:** We found there is significant difference in intraoperative time in Coblation tonsillectomy compared to Conventional; method of tonsillectomy with mean operation time, Intra operative blood loss, post-operative pain, average time taken to return to normal diet and activity.

**Conclusion:** Coblation tonsillectomy significantly reduces operation time, intra operative blood loss, Post-operative blood loss, Post-operative pain and patient returns to regular routine but with higher cost.

**Keywords:** Palatine Tonsils; Coblation Tonsillectomy; Conventional Tonsillectomy; Post-Operative Time; Post-Operative Blood Loss

### Introduction

Palatine tonsils are collection of lymphoid tissue situated in oropharynx within tonsillar fossa. Tonsils are important in children because of its role in immunology and defence mechanism. Antibody secretion especially secretory IgA Production plays important role in mucosal defense mechanism. Due to some unknown etiology, their protective mechanism sometimes fails and becomes seat of infection which presented most commonly with symptoms of sore throat and recurrent cold and cough. Some may have complain of obstructive symptoms, snoring and difficulty in swallowing and other complication. This requires removal of diseased tonsils.

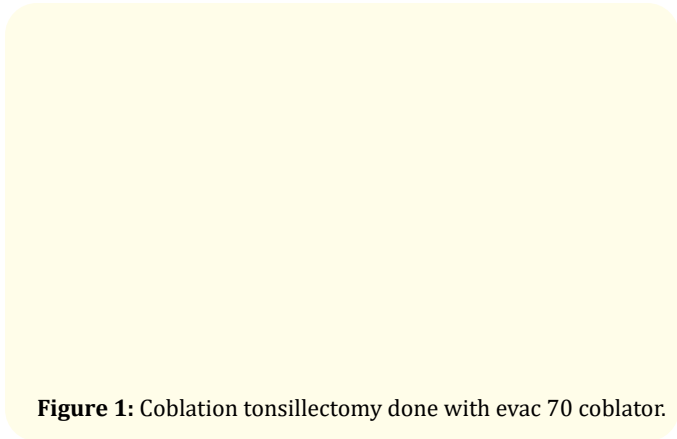
Tonsillectomy is most routinely performed surgical operation in the recent years [1,2] in which both the palatine tonsils are fully removed from back of the throat [3]. It is mainly done for chronic

tonsillitis and obstructive sleep apnea (OSA). For the century, conventional dissection tonsillectomy has remained the gold standard for tonsil removal [4]. But traditional tonsillectomy leaves the wound open to heal by secondary intension, thus cause pain and bleeding as two major postoperative complications. There are various methods described in other literature for tonsillectomy which includes dissection, guillotine, cryosurgery, monopolar and bipolar diathermy dissection and laser surgery. But the superiority of one over another has not been clearly demonstrated. But pioneers usually concentrate on technique to decrease pain and bleeding. For recurrent tonsillitis, it has reported that watchful waiting results in a higher cost compared to tonsillectomy.

As regard to the different surgical techniques, improving the intra-operative efficiency and reducing post-operative morbidity are the most important parameter to in assessing the best method in

this procedure. The common side effect of tonsillectomy are pain and post-operative bleeding, but patient may also experience difficulty in swallowing, nausea, vomiting, throat and ear pain, fever.

Coblation tonsillectomy was initially introduced in 2001 [5] following which a great amount of articles published to confirm its efficacy (Figure 1). On comparing coblation tonsillectomy and conventional tonsillectomy, many studies have been done. Coblation process involves passing a bipolar radiofrequency current through isotonic saline to convert it into an ionized plasma layer. This layer effectively disrupts intracellular molecular bonds in the tissues resulting in a vaporization effect. Surface irrigation and suction are applied to prevent significant pooling of saline inside the oral cavity. Coblation generates a substantially low thermal effect compared to electrocautery, estimated between 40 - 70°C [6], with a subsequent presumption of diminished collateral thermal damage to surrounding tissues. While in electrocautery, which is used in conventional dissection tonsillectomy it reaches upto 400 - 600°C [7,8]. The thermal penetration is minimal with coblation, but it is usually very deep with electrocautery. The target tissues undergo dissolution in Coblation, But there is rapid heating, charring and cutting of target tissue with electrocautery. Finally, surrounding tissue are not much affected with coblation. They undergo minimal dissolution. But with electrocautery there is charring/burning of surrounding tissue.



**Figure 1:** Coblation tonsillectomy done with evac 70 coblator.

Some study in UK found no benefits for coblation method comparing with conventional tonsillectomy indicating that conventional tonsillectomy is superior to coblation method. The NICE guidelines have suggested that coblation is probably associated with decreased post-operative pain comparing with bipolar diathermy.

**Aims and Objective**

To compare clinical and surgical outcome in patient of chronic tonsillitis with coblation and dissection tonsillectomy in aspect of parameters like operating time, intra-operative blood loss, post-operative pain, time needed to return to normal diet and activity.

**Materials and Methods**

It is a prospective case study of 54 patients who came to civil hospital, Ahmedabad, Gujarat in duration of one year from October 2018 to October 2019 with complains of throat pain and obstructive symptoms who was diagnosed with chronic tonsillitis and Tonsillar hypertrophy and in which out of 27 patient underwent Coblation type tonsillectomy and 27 patients underwent conventional type tonsillectomy and comparison of the operation time, intra operative blood loss, postoperative pain, time needed to regain normal diet and normal activity done in these two group of patients. close watch was kept for other complication.

**Inclusion and exclusion criteria**

	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
1	Chronic tonsillitis (7 or more episodes/year or 5 or more episodes/year for 2 years or 3 or more episode/year for 3 years	Age less than 5 year and more than 45 year.
2	Obstructive symptoms related to tonsil hypertrophy	Patient with history of bleeding disorder.
3	Age between 5 to 45 years come under the study	History of tonsillitis within three weeks prior to surgery
4		Patient who gives negative consent for surgery

Patient were examined including history, General examination, ENT examination, Posterior rhinoscopy followed by Routine blood examination with X-ray soft tissue neck lateral view was done in all patients. Informed and written consent was obtained from each subjects.

No antibiotic, topical or local anaesthesia, or other medications administered before surgery.

Anaesthetic approach was the same for all patients. Patient was allocated in each group by surgeon based on a randomly generated number sequence. The operation was performed in the standard way using either the Evac-70 coblator wand or steel cold dissection instruments.

All procedure was done by first author to lower any probable skill related bias. Operation time from insertion till removal of crow davis blade was recovered for each patients. Intra operative blood loss by checking volume of blood in suction bottle after operation and post-operative cares were the same in both groups in form of Antibiotic, analgesics, povidone iodine gargles and all patients got discharged on day one.

Data including age, volume of blood loss, operation time, post-operative pain score, post-operative hemorrhage, days needed to return to work and normal diet were gathered in both groups. Patients were examined for following post-operative complications during post-surgical visits: readmission due to postoperative pain. On discharge, the patients were advised to call medical group for any complications especially bleeding. Follow up of all patients was performed.

Primary haemorrhage was defined as bleeding occurring within 24 hours after surgery and secondary hemorrhage as bleeding after 24 hours postoperatively.

Each patients completed questionnaire (Table 1) adapted from Questionnaires as detailed by Chang and Myatt to evaluate concerning the time to return to normal activity and normal diet on same day, on day 1 and 7<sup>th</sup> day on follow up [9].

1) Did your child have to miss school/daycare?	A) Yes	B) No	C) Does not attend school/daycare	
2) Have you/your child been drinking?	A) Not at all	B) Have sips when being forced	C) Sips on their own	D) Drinking as usual
3) Have you/your child been eating?	A) Not at all	B) A few mouthful	C) Eating less than normal	D) Eating normally
4) What kind of foods have you/ your child been eating?	A) Has not been eating	B) Juices and fluids	C) Soft foods	D) Regular diet
5) Have you/your child been talking?	A) Not at all	B) A few words	C) In a normal voice but less talkative than usual	D) Talking as usual
6) Have you /your child been active?	A) Not lying in bed	B) Reluctant to sit up in bed	C) Sitting up in bed	D) Getting out of bed
7) Has your child been playing?	A) Not at all	B) Playing in bed	C) Getting up to watch others	D) Getting up to play
8) How have your /your child’s mood been?	A) Silent	B) Unhappy and miserable	C) A little upset	D) cheerful

**Table 1:** Questionnaires for patient evaluation (adapted from Questionnaires as detailed by Chang and Myatt).

Visual analog scale was used for the pain severity, ranging from 1 to 10. Zero indicated no pain and 10 revealed an extreme pain.

**Results**

There was no significant difference between mean age of two groups being 10.2 years in coblation tonsillectomy group and 10.5 years in conventional tonsillectomy group.

Intra operative blood loss turned out to be 109 +/- 30 ml for coblation tonsillectomy and 160 +/- 50 ml for conventional tonsillectomy. Most operation tome was 25 - 30 minutes in coblation tonsillectomy and 40 - 45 minutes for conventional tonsillectomy. So mean operation time was thus significantly less for coblation group.

Postoperative pain scores were evaluated for both groups where higher postoperative pain score in coblation group found which is statistically significant. Mean return to normal general condition was earlier in coblation which is approximately 5 - 7 days for coblation tonsillectomy group and 10 - 12 days for conventional tonsillectomy group.

It was revealed that primary and secondary haemorrhage rate was slightly higher in conventional tonsillectomy group that is 14.81% and 18.51% respectively (Table 2).

	Convention tonsillectomy	Coblation tonsillectomy
Primary hemorrhage	4 (14.81%)	2 (7.4%)
Secondary hemorrhage	5 (18.51%)	1 (3.7%)

**Table 2:** Post-operative hemorrhage.

During follow up period, no other major or minor complications occurred in our study.

**Discussion**

In this study we compared two techniques of tonsillectomy, the coblation and conventional tonsillectomy. Some significant differences were shown between outcomes of these two methods. Tonsillectomy is one of the most common operations performed worldwide. Conventional Tonsillectomy consumes longer time than coblation tonsillectomy. One large scale trial performed to date found 1% hemorrhage rate using coblation. But in our study of 54 patients, There is 11.11% post-operative hemorrhage case found in coblation tonsillectomy as compared to 33.33% with conventional tonsillectomy that is due to less blood loss and less surrounding tissue damage by Coblation which helps in faster recovery of patient and getting back to normal diet and normal activity found in patients with Coblation tonsillectomy.

On other hand there are some study which reported no significant reductions in pain with coblation surgery compared to conventional method of tonsillectomy which is found to be similar with our study.

Difference between pain on the day of surgery has no significant difference between both of the group but after that group of the patient operated with coblation has more complain of pain as compared to other group. Removal of tonsil and achieving homeostasis was more difficult in patient operated with conventional method of tonsillectomy. The incidence of post op haemorrhage rate is of 0 - 25% which favors our study [10-12].

To evaluate the return to normal activity, patients were asked about the duration of starting there work. Patients who are operated with coblation are reported to get back to their normal work and normal diet early as compared to conventional tonsillectomy patients.

The reduction in operation time, intra operative blood loss which is significantly low with coblation tonsillectomy which is also favoured with return to normal activity and normal diet. And there is significant reduction in haemorrhage rate with coblation tonsillectomy as compared to conventional method of tonsillectomy, but it is a costly.

Therefore, we believe that coblation tonsillectomy is effective with little more pain and costly.

## Conclusion

As conclusion of my study coblation tonsillectomy to be a safe and effective alternative to conventional tonsillectomy. Our study showed a significant difference in post-operative morbidity and complications between patients undergone coblation tonsillectomy and conventional tonsillectomy. Coblation tonsillectomy significantly reduced the operation time, intraoperative blood loss and early return to normal diet and activities.

We can recommend coblator as suitable method for tonsillectomy.

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