

## Original Research Article

# Coblation vs. dissection tonsillectomy: a prospective randomized study comparing surgical and clinical outcomes

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### ABSTRACT

**Background:** The objective of this study is to compare operative time, intraoperative bleeding, postoperative pain between coblation and dissection tonsillectomy.

**Methods:** A total of 62 patients who met the inclusion criteria were divided into two groups according to the surgical procedure they went through. Surgical time intraoperative blood loss, postoperative pain, postoperative regaining of activity and any episode of postoperative bleeding were noted in both the groups and compared.

**Results:** Coblation tonsillectomy fared better than dissection tonsillectomy in terms of having less intraoperative blood loss, less postoperative pain. Patients who underwent coblation assisted tonsillectomy also had earlier return to normal activities. Though the time required for coblation tonsillectomy was more than dissection tonsillectomy there were no episodes of postoperative bleeding in subjects who underwent coblation tonsillectomy.

**Conclusions:** Coblation assisted tonsillectomy is a promising new technique for tonsillectomy as patients had less postoperative morbidity mainly pain. The surgical time required could be reduced further with experience.

**Keywords:** Coblation, Tonsillectomy, Double blind

### INTRODUCTION

Tonsillectomy is the surgical procedure of removing tonsils. Though the incidences of tonsillectomy have reduced nowadays it still remains one of the most common surgical procedures performed worldwide.<sup>1</sup>

Celsus was first to report removal of tonsil in 30 BC after which various surgical techniques have been evolved with improved instrumentation for this purpose.<sup>2</sup>

The major postoperative complications of tonsillectomy are postoperative pain and haemorrhage.

The number of different techniques employed for tonsillectomy in literature are guillotine method, cold

dissection, electrocautery, harmonic scalpel, coblation and laser surgery.<sup>3</sup>

Any improvements in these methods should improve the surgical outcome of the surgery in reducing the operative time, intra operative blood loss and reducing complications and morbidity of the patients mainly postoperative pain and blood loss thus resulting in earlier regaining of activity.

Coblation means “controlled ablation” initially used in arthroscopic surgeries and later used in ENT. Coblation technology is based on non heat driven process of soft tissue dissolution which makes use of bipolar radio frequency energy.<sup>4</sup>

Current from the radiofrequency probe is made to pass through a medium such as saline which breaks saline into highly energized sodium and chloride ions thus forming plasma field. This plasma field is strong enough to break the organic molecular bond and melts tissue at relatively lower temperature (70°C) as compared to electrocautery. It causes minimal thermal penetration and less effect on the surrounding tissue.

### **Aim**

The aim of the present study is to compare low temperature coblation technique of tonsillectomy with the routinely used dissection method of tonsillectomy.

### **METHODS**

The present prospective double blind study was carried out in Geetanjali medical college and hospital, Udaipur, Rajasthan, India. The study period was from January 2017 to July 2018. All the patients who attended the ENT OPD were included in the study after meeting the inclusion criteria and who were willing to take part in the study. This study was concluded in a total of 62 patients. (31 in each group)

#### **Inclusion criteria**

Inclusion criteria were recurrent tonsillitis >3 episodes per year; tonsillar hypertrophy resulting in snoring but no sleep apnoea; halitosis due to chronic tonsillitis not responding to medical treatment.

#### **Exclusion criteria**

Exclusion criteria were patients with history of peritonsillar abscess; patients with known bleeding disorder; patients with tonsillar malignancy.

After meeting the inclusion criteria patients were divided into two groups according to the surgical technique used; group A included patients who underwent coblation tonsillectomy and group B who underwent tonsillectomy by conventional cold dissection method.

Conventional tonsillectomy was performed using curved Metzenbaum scissors to enter the peritonsillar space, blunt dissection to remove the tonsil from superior to inferior, and a wire snare to divide the inferior pole. Hemostasis was obtained with a bipolar cautery at a setting of 35.

The coblation-assisted tonsillectomy was performed with the EVAC70 T&A (ArthroCare ENT, Sunnyvale, CA) hand piece using subcapsular dissection along the tonsillar pillar mucosa, leaving muscle intact. Dissection was carried out on the coblate setting of 7, and hemostasis was obtained on the coagulate 3 setting. Anesthesia and recovery room techniques were standardized for all patients.

The groups were compared on the following outcomes. Surgical time, intra operative blood loss, postoperative pain, secondary haemorrhage and postoperative return to normal activities.

The operative time was recorded for both the groups from the start of incision till complete haemostasis was achieved.

The intra operative blood loss was measured as the volume of blood in the suction bottle minus the saline and the amount of blood in the cotton ball.

Postoperative pain was assessed using visual analogue scale (VAS) from 0 (no pain) to 10 (worst pain) at 24 hours, 48 hours and at 10<sup>th</sup> postoperative day.

Postoperative bleeding was documented including the side, day on which it occurred.

On follow up patients were asked about the day of returning to normal activity.

The statistical analysis was done using SPSS software.

### **RESULTS**

#### **Demographic data**

There were 28 females and 34 males with maximum number of patients in the age group of 10-19 years. The youngest patient was 5 years old and the oldest was 45 years old. 45.2% females underwent tonsillectomy as compared to 54.8% males.

#### **Surgical time**

Coblation tonsillectomy took 31.803±4.94 minutes as compared to dissection tonsillectomy which took 20.755±3.36 minutes. Thus it took 11 minutes longer to perform coblation tonsillectomy and the results were statistically significant (p<0.001) (Table 1).

**Table 1: Comparison of mean operating time (min) among study groups.**

Group	N	Mean	SD
<b>Coblation tonsillectomy</b>	31	31.803	4.94
<b>Conventional tonsillectomy</b>	31	20.755	3.36

t-test -- t = 10.286 with 60 degrees of freedom; p<0.001 (S).

#### **Intraoperative blood loss**

The intraoperative blood loss calculated after adding the amount of blood in the suction bottle plus the weight of the cotton ball was 85.77 ml in coblation group. Whereas in the conventional dissection group the blood loss was 109.79 ml and the difference was statistically significant (p<0.001) (Table 2).

**Table 2: Comparison of Intra operative bleeding (ml) among study groups.**

Group	N	Mean	SD
Coblation tonsillectomy	31	85.771	16.27
Conventional tonsillectomy	31	109.219	14.24

t test -- t = 6.036 with 60 degrees of freedom; p<0.001 (S).

**Postoperative pain**

There was comparatively more pain in the conventional dissection group in the first 24 and 48 hrs than the coblation group. The difference was also statistically significant. However on the 10<sup>th</sup> postoperative day the difference between the pain scores amongst the two groups did not reach any statistical significance (p<0.001) (Table 3).

**Table 3: Comparison of post operative pain score among study groups.**

	Procedure	No.	Mean	Std. deviation	Mean diff	't' score	P value
Postoperative pain 24 hours	Coblation	31	7.35	0.950	1.065	4.753	P<0.001 (Significant)
	Conventional	31	8.42	0.807			
Postoperative pain 48 hours	Coblation	31	5.42	0.923	1.323	5.853	P<0.001 (Significant)
	Conventional	31	6.74	0.855			
Postoperative pain 10 days	Coblation	31	1.19	0.601	0.355	2.515	P<0.05 (non-significant)
	Conventional	31	1.55	0.506			

**Table 4: Comparison of time to post operative time to regaining of activity (days) among study groups.**

Group	N	Mean	Standard deviation
Coblation tonsillectomy	31	6.68	1.077
Conventional tonsillectomy	31	8.13	0.957

t-test ---t = 5.61 with 60 degrees of freedom; p<0.001 (S).

**Table 5: Distribution of study subjects according to post operative bleeding.**

Post op bleeding	Coblation tonsillectomy		Conventional tonsillectomy		Total	
	N	%	N	%	N	%
Yes	0	0	1	0	1	1.62
No	31	100	30	100	61	98.38
Total	31	100	31	100	62	100

**Regaining of activities**

The postoperative regaining of normal activities was quicker in the coblation group as compared to the conventional dissection group. The coblation group took an average of 6 days to return to normal activity as compared to 8 days in the dissection group. The difference was also statistically significant (p<0.001) (Table 4).

**Postoperative bleeding**

There was one episode of postoperative bleeding in the cold dissection group which was reported on the 7<sup>th</sup> post operative day and was managed conservatively. There was no episode of postoperative bleeding in the coblation group (Table 5).

**DISCUSSION**

Tonsillectomy is considered to be the most common surgical procedure performed worldwide in the field of

otolaryngology. Dissection tonsillectomy is amongst the most commonly practiced techniques for tonsillectomy. In hands of an experienced surgeon dissection tonsillectomy usually takes a shorter time. Although tonsillectomy is a quick surgery the postoperative morbidity maybe significant. Coblation tonsillectomy is a recently introduced technique that was started in 1997 mainly for arthroscopic surgeries. In tonsillectomy the main aim is to reduce postoperative morbidity mainly pain and haemorrhage.

In the present study the time taken to perform coblation tonsillectomy was more than conventional dissection and snare method with a difference of 11 minutes. The difference was statistically significant. The results were comparable to the study conducted by Singh et al where coblation tonsillectomy took 15 min as compared to 11 mins in the conventional group.<sup>5</sup> However the results of the present study did not match the results of the study conducted by Wang et al where coblation tonsillectomy took shorter time as compared to dissection method (10 minutes vs. 36 minutes).<sup>6</sup>

The present study shows statistical difference between the intraoperative blood loss amongst the two groups. The intraoperative blood loss in the coblation group was 85.77 ml as compared to 109.7 ml in the dissection group. Similar results were found in the study conducted by Singh et al and in a study conducted by Nithya et al where the blood loss in the conventional group was more than the coblation also reaching a statistical significance in terms of intraoperative blood loss.<sup>5,7</sup>

In the present study the average pain score using visual analogue score (VAS) was more in the conventional group as compared to the coblation group. The difference was statistically significant. Similar statistically significant results were found when the pain scores were compared in the study conducted by Wang et al and Nithya et al.<sup>6,7</sup> However, in a study conducted by Tan et al there was no difference between the pain scores between the two group.<sup>8</sup> This study was conducted only amongst pediatric population.

In the present study there was one episode of postoperative bleeding in the conventional group whereas there were no reported cases of postoperative bleeding amongst the coblation group. The results however do not match the results of the study conducted by Polites et al where he conducted a study amongst 20 adult patients out of which 3 reported postoperative bleeding.<sup>9</sup> In a study conducted by Belloso et al amongst 844 patients who underwent coblation tonsillectomy and 743 patients who had dissection tonsillectomy came to a conclusion that the secondary haemorrhage rates were higher in the cold dissection group 6.19% as compared to 2.25% in the coblation group.<sup>10</sup>

In the present study there was earlier return to normal activity in the coblation group than the conventional group. The difference was found to be statistically significant. The results were similar to the results in the study conducted by Tan et al where the return to normal activity was earlier in the coblation group as compared to the monopolar electrocautery group.<sup>8</sup> However in a study conducted by Wang et al both the groups took similar time to return to normal activity.<sup>6</sup>

## CONCLUSION

Coblation is a recently introduced technique for tonsillectomy. It involves a not heat driven process with a conductive medium like saline to form a highly energized field called plasma which helps in tissue dissolution. Because of the low temperature required in this process this damage to the surrounding tissue is minimal. With the results of the present study it is possible to conclude that coblation tonsillectomy proved superior than dissection tonsillectomy in terms of less postoperative pain, intraoperative blood loss and earlier regaining of activity. Though coblation tonsillectomy required more operative time it could be reduced with further

experience. The other drawback which should be considered is the high surgical charges which are due to the cost of the wand which is meant for single use.

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