

# Intraoperative Blood Loss, Surgical Duration and Postoperative Pain following Cold Dissection Tonsillectomy and Bipolar Electrocautery Tonsillectomy

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## ABSTRACT

### Introduction

Tonsillectomy surgery is one of the common surgeries done in department of ENT and HNS. Over the past two centuries, indications and techniques for performing tonsillectomy has much changed. Several techniques for tonsillectomy are described, but their relative effectiveness still remains a matter of debate. To compare the intraoperative bleeding and post-operative pain following bipolar electrocautery tonsillectomy and cold dissection tonsillectomy.

### Methods

This prospective randomized study was conducted on 60 tonsillitis patients planned for surgery in College of Medical Sciences, Bharatpur, Chitwan during a period of one year. They were divided into two groups: one undergoing tonsillectomy by use of bipolar electrocautery and the other Cold dissection tonsillectomy by random selection. Intraoperative bleeding and post-operative pain were scored and compared.

### Results

In this study, the mean blood loss during cold dissection tonsillectomy was 25ml and during bipolar cautery was 12ml. The average operative time was 30 minutes for cold dissection group and 25 minutes for bipolar cautery group. The pain score for Cold dissection tonsillectomy group was significantly less when compared with pain scores for bipolar cautery tonsillectomy group.

### Conclusions

Our study shows that tonsillectomy using bipolar electrocautery causes less blood loss and decreased operative duration than cold steel dissection, however it caused relatively more postoperative pain than cold steel dissection tonsillectomy.

**Keywords:** bipolar electrocautery; bleeding; cold dissection; pain; tonsillectomy.

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## INTRODUCTION

Several techniques for tonsillectomy are described and their relative effectiveness remains a matter of debate. The method chosen by the surgeon has often depended on their personal preference based on training and experience and each method has its advantage and disadvantage. Cold dissection method is the traditional method of doing tonsillectomy. More recently, bipolar cautery assisted tonsillectomy has been preferred by majority of surgeons.<sup>1</sup>

Among the various techniques described, best possible technique in terms of patient symptoms during immediate post operative period, operative time and cost of the procedure should be identified. In our institution bipolar electrocautery method and cold steel dissection methods are routinely practiced. This study was aimed to compare the bleeding and pain after tonsillectomy in bipolar electrocautery tonsillectomy versus cold dissection tonsillectomy.

## METHODS

The study was a prospective randomized study carried out in department of ENT in College of Medical Sciences, Bharatpur. All the patients with tonsillitis planned for surgery were taken into account. The duration of study was one year. Sixty patients were included in the study. They were divided into 2 groups: one group undergoing tonsillectomy by use of bipolar cautery (group BET) and the other by Cold dissection and snare (group CDT) by random selection. Surgery list was prepared randomly following first come first case basis by the resident doctor of ENT who was unaware about the group allotment. Each alternate patient was allotted in either group.

Sample size calculation was based on the prevalence of surgical management of tonsils in COMSTH during one year period, the previous

year, fulfilling the criteria of the study. The inclusion criteria for our study was patient with history of Recurrent tonsillitis, Sleep disordered breathing, Chronic tonsillitis, Unilateral tonsillar enlargement. Patients with known bleeding disorders, Acute infections of tonsils, Contraindications for general anesthesia and unwilling or unable to give informed consent were excluded from this study.

Approval from the institutional review committee of our hospital was taken. Patients were evaluated according to standard clinical practice guidelines. Written informed consent was obtained regarding surgical procedure and inclusion to the study. Patient were taught and made aware about the Visual Analog Scale (VAS) scoring system preoperatively.<sup>2</sup> (Figure 1)

All patients were premedicated with inj glycopyrrolate 0.002mg per kg 30 minutes before induction of anesthesia. Anesthetic and analgesic techniques were made similar in every patients. Surgery was done by one of the experienced faculties. Data collection was done by on duty resident of department of ENT who was unaware about the group allotment. Data analysis was done using current version of SPSS. P value less than 0.05 was considered statistically significant.

The Objective Pain Score was measured using a scale given by Tandon M et al<sup>3</sup> (Table 1). Amount of blood loss was estimated immediately after the surgery and pain scoring was done using visual analogue scale rating from 0-10 post operatively after 1,2,3,4,6,8,10 hours.

0	1	2	3	4	5	6	7	8	9	10
NOPAIN		Annoying (mild)		Uncomfortable (moderate)		Horrible (severe)		WORST		

**Figure 1.** Visual Analogue Scale

<b>Table 1. Objective pain score</b>	
Objective assessment parameters	Score
Inadequate pain relief/pain at rest	1
Pain free at rest/ Normal breathing	2
Pain free when deep breathing/ incentive spirometry, but pain when coughing	3

### Measurement of intraoperative blood loss

The blood loss intraoperatively present over the suction was measured. The suction tubing was flushed with 30 mL of normal saline solution at the conclusion of each procedure after hemostasis was achieved and before irrigating the oral cavity or oropharynx. The measured intraoperative blood loss was calculated as the total amount of fluid in the suction canister, excluding the measured 30 mL of normal saline solution used to flush the suction tubing. Based on experiment done by Hughes et al<sup>5</sup>, we estimated an amount of 5 cc blood loss in a completely soaked 2x2 gauze and 10 cc in completely soaked 4x4 sponge.

The amount of blood loss was graded as below.<sup>4</sup>

Grade	Visually estimated rate of blood loss(mL/min)
0	<1.0
1	>1-5
2	>5-10
3	>10-50
4	>50

### Methodology of evaluation

Patients were assessed using the pain scale and amount of intraoperative blood loss. Immediate postoperative pain was evaluated using visual analogue scale and the amount of blood loss measure from suction as well as counting the number of gauge piece soaked with blood.

## RESULTS

The current study included 60 patients planned for tonsillectomy who were randomly divided

into two groups. The mean age of presentation was 23.2 years. In this study there were 39 male patients 65% and 21 female patients 35%.

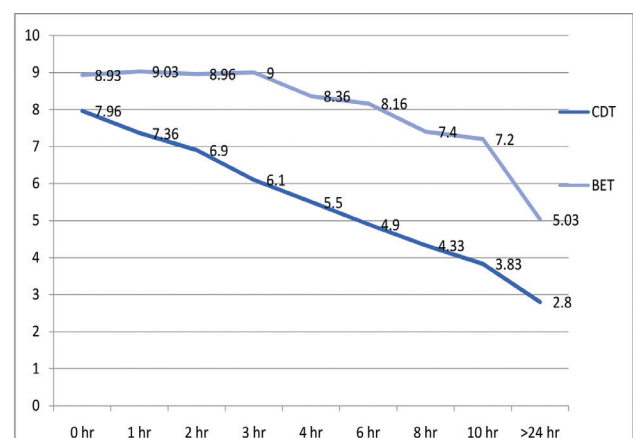
The mean operative time for doing tonsillectomy using cold dissection method was 30 minutes and that for bipolar cautery was 25 minutes. The two-tailed p value was less than 0.0001. This difference was considered to be statistically significant.

The mean blood loss during cold dissection tonsillectomy was 25ml and during bipolar cautery was 12ml. The two-tailed p value was less than 0.0001. This difference is considered to be statistically significant.

**Table 2. Descriptive Statistics of Intraoperative Bleeding**

	CDT group	BET group
Mean	24.80	12.20
SD	2.94	1.56
SEM	0.54	0.29
N	30	30

Pain was recorded using visual analogue scale rating from 0-10 post operatively after 0,1,2,3,4,6,8,10 hrs. Pain during bipolar cautery tonsillectomy was higher as compared to cold dissection tonsillectomy with a two-tailed P value equal to 0.0001. This difference was considered significant statistically.

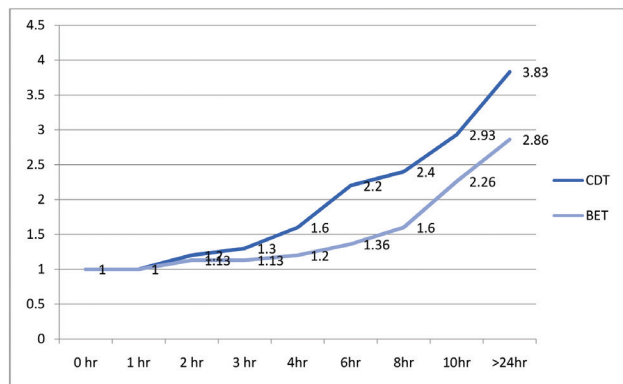


**Figure 2. Diagrammatic Presentation of Subjective Pain Score**

Objective Pain Score was measured using scale given by Tandon M. et al. The two-tailed P value was less than 0.0001. This difference was considered to be statistically significant.

**Figure 3.** Line diagram showing mean MAP

Group	CDT	BET
Mean	5.5003	8.006
SD	0.6832	0.5301
SEM	0.1247	0.0968
N	30	30



**Figure 3.** Diagrammatic Presentation of Objective Pain Score

**Table 4.** Descriptive Statistics of Objective Pain Score

Group	CDT	BET
Mean	1.9703	1.5023
SD	0.2207	0.1726
SEM	0.0403	0.0315
N	30	30

**DISCUSSION**

The current study was conducted to compare the intraoperative time, intraoperative blood loss and post-operative pain using cold dissection vs bipolar cautery tonsillectomy.

Patients were divided into CDT and BET groups. Each group had 30 patients. The maximum number of patients who underwent tonsillectomy were of age group 20-30yrs. The mean age of presentation for CDT was 17.83yrs and that for BET was 28.56 yrs. Out of 60 patients

39 were male(65%) and 21 were female(35%). In our study the mean tonsillectomy time for CDT was 31 min and that for BET was 25 min. The Operative time in bipolar electrocautery was less in comparison to cold dissection, which we supposed, was due to early achievement of hemostasis secondary to use of bipolar cautery.

In our study the mean intraoperative blood loss during CDT was 25ml and that during BCT was 12 ml which again was supposed to be due to early hemostasis obtained using bipolar cautery. We observed increased post-operative pain using bipolar cautery than cold dissection .

Silveria H. et al. in their study observed decreased operative time, blood loss but increased pain scores postoperatively using bipolar cautery during tonsillectomy which was similar to our study. They found mean tonsillectomy time, including completion of hemostasis to be 22.67 min for the Cold dissection (CD) group and 16.77 min for the bipolar cautery (BC) group. Mean intraoperative blood loss was 73.78ml for the CD group and 29.58 ml for the BC group. The intensity of pain was slightly higher in the BC group compared with the CD group.<sup>6</sup> Similarly Pang, Kirazli et al. and MacGregor et al. found significantly less intraoperative blood loss with Bipolar electrocautery use compared to Cold dissection during tonsillectomy.<sup>7-9</sup>

Pang YT conducted a prospective study designed to evaluate BCT technique against the CDT technique. They observed statistically significant shorter operating time (mean 11.2 minutes) and lower intraoperative blood loss (mean 5 ml) using the bipolar diathermy technique.<sup>7</sup>

Postoperative pain is one of the most important factors in decision of the tonsillectomy technique. Adequate postoperative pain management is of paramount importance for early recovery, decrease hospital stay and overall patient satisfaction. In this study we observed significant

decreased pain in patients undergoing cold dissection tonsillectomy when compared with bipolar electrocautery technique. Decreased pain sensation could be due to decreased and localized tissue injury in cold dissection technique. Similar to our study, Lassaletta L et al in their prospective single-blinded observed increase in late postoperative pain in patient undergoing bipolar electrocautery assisted tonsillectomy when compared with cold dissection technique.<sup>15</sup>

MacGregor et al. and Pang found no difference between bipolar electrocautery and cold dissection.<sup>7,9</sup> Mann et al., Weimert et al., Nunez et al., Leach et al., and Atallah et al. all found no difference for the first postoperative day but more pain with bipolar electrocautery in following days.<sup>10-13</sup> Raut et.al, in their

prospective, randomized multiunit study observed statistically insignificant difference in the pain scores between the two methods.<sup>14</sup>

### Limitations

We feel that the study would have been better if surgery was performed by single surgeon and larger study sample were taken.

### CONCLUSION

Following this study it is concluded that, Bipolar electro-cautery tonsillectomy and Cold dissection tonsillectomy are both safe approaches for tonsillectomy with advantages of decreased surgical time and intraoperative bleeding in Bipolar diathermy technique and decreased immediate postoperative pain scores in Cold dissection technique.

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