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# Post-operative Outcomes and Recovery Differences Between Electrocautery and Cold Dissection Tonsillectomy Techniques: A Comparative Study

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ABSTRACT

**Background:** Tonsillectomy is one of the most common surgical procedures performed in otolaryngology. The choice of surgical technique, particularly electrocautery versus cold dissection, can influence operative time, intraoperative blood loss, post-operative pain, and recovery time. **Objective:** To compare post-operative outcomes, complications and recovery parameters in patients undergoing tonsillectomy using electrocautery versus cold dissection techniques. **Methods & Materials:** This prospective study included 70 patients aged 5–40 years undergoing elective tonsillectomy at National Institute of ENT, Tejgaon, Dhaka, Bangladesh from January to December 2024. Patients were randomly assigned to either Electrocautery Group (n=35) or Cold Dissection Group (n=35). Key outcome measures included operative time, intraoperative blood loss, post-operative pain (assessed using Visual Analog Scale, VAS), time to resume oral intake and incidence of post-operative hemorrhage and other complications. Data were analyzed using SPSS v25, and p-values <0.05 were considered statistically significant. **Results:** The mean operative time was significantly shorter in the electrocautery group (28.3 ± 4.6 min) compared to the cold dissection group (37.5 ± 5.2 min, p<0.001). Intraoperative blood loss was lower in the electrocautery group (35.7 ± 10.4 mL) versus cold dissection (72.5 ± 15.2 mL, p<0.001). Post-operative pain scores at 24 hours were higher in the electrocautery group (VAS 6.2 ± 1.1) compared to cold dissection (VAS 4.8 ± 1.2, p<0.001). Time to resume normal diet was shorter in cold dissection (3.2 ± 1.0 days) compared to electrocautery (4.5 ± 1.2 days, p=0.002). Minor post-operative hemorrhage occurred in 2 patients in each group, with no major complications reported. **Conclusion:** Electrocautery tonsillectomy offers the advantage of reduced operative time and blood loss, while cold dissection provides less post-operative pain and faster recovery. Choice of technique should be individualized based on patient characteristics surgeon preference, and clinical priorities.

***Keywords:*** *Tonsillectomy, Electrocautery, Cold Dissection, Post-Operative Pain, Recovery, Blood Loss.*

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## INTRODUCTION

Tonsillectomy is one of the most commonly performed surgical procedures in otolaryngology, indicated primarily for recurrent tonsillitis and obstructive sleep disorders related to tonsillar hypertrophy. [1,2] Despite being a routine procedure, tonsillectomy is associated with significant post-operative pain, risk of hemorrhage, and variable recovery periods, making the choice of surgical technique clinically important. [3] Several techniques have been developed to optimize surgical outcomes, among which cold dissection and electrocautery tonsillectomy are most widely used. Cold dissection, the traditional method, involves sharp dissection of the tonsil using scissors and forceps, followed by ligation of bleeding vessels.[4] This technique allows precise tissue removal with minimal thermal injury, which is thought to reduce post-operative pain and promote faster recovery. However, cold dissection is associated with longer operative times and higher intraoperative blood loss compared to newer modalities. [5] Electrocautery tonsillectomy, on the other hand uses monopolar or bipolar electrocautery to simultaneously dissect tissue and achieve hemostasis. [6] This method significantly reduces operative time and intraoperative bleeding, which is particularly advantageous in patients with coagulopathies or those requiring shorter anesthesia duration. [7] Nevertheless, thermal injury to surrounding tissues can increase post-operative pain and may prolong recovery especially in pediatric populations. [8] Previous studies comparing the two techniques have reported mixed outcomes. Some have demonstrated reduced operative time and blood loss with electrocautery but higher post-operative pain and delayed return to normal diet. [9,10] Others suggest that cold dissection remains preferable for minimizing discomfort and facilitating early recovery despite longer surgery and increased bleeding.[11] The ongoing debate indicates a need for context-specific evaluation, considering patient demographics, clinical indications and resource availability. The present study aims to compare post-operative outcomes, including pain, recovery time, intraoperative blood loss and complications, between electrocautery and cold dissection tonsillectomy in a cohort of 70 patients. By providing objective, prospective data, this study seeks to guide clinical decision-making and assist surgeons in selecting the most appropriate technique based on patient needs and surgical priorities.

## METHODS & MATERIALS

**Study Design and Setting:** This was a prospective, comparative study conducted at the
National Institute of ENT, Tejgaon, Dhaka, Bangladesh from January to December 2024. The study aimed to evaluate post-operative outcomes and recovery differences between electrocautery and cold dissection tonsillectomy techniques in patients undergoing elective tonsillectomy. Ethical approval was obtained from the institutional review board, and written informed consent was obtained from all participants or their guardians.

**Study Population:** A total of 70 patients aged 5–40 years, scheduled for elective tonsillectomy, were enrolled. Inclusion criteria included: (1) recurrent tonsillitis (≥3 episodes per year) or obstructive sleep apnea secondary to tonsillar hypertrophy, and (2) ASA physical status I or II. Exclusion criteria were: (1) bleeding disorders, (2) systemic illness affecting

wound healing, (3) prior tonsillar or oropharyngeal surgery, and (4) inability to comply with post-operative follow-up.

**Randomization and Grouping:** Patients were randomly allocated into two equal groups using a computer-generated randomization table: Electrocautery Group (n=35) and Cold Dissection Group (n=35). Both groups underwent standard pre-operative evaluation, including complete blood count, coagulation profile, and anesthetic assessment.

**Surgical Techniques:** All surgeries were performed under general anesthesia with orotracheal intubation by experienced ENT surgeons.

- **Cold Dissection Technique:** The tonsils were removed using scissors and dissecting forceps. Hemostasis was achieved with ligatures or sutures as necessary. Care was taken to avoid excessive tissue trauma and preserve surrounding structures.
- **Electrocautery Technique:** Monopolar electrocautery was used for dissection and simultaneous coagulation. Power settings were standardized to minimize thermal injury while ensuring adequate hemostasis.

**Outcome Measures:**
Primary outcomes included operative time (minutes), intraoperative blood loss (mL), post-operative pain assessed using the Visual Analog Scale (VAS) at 6, 24, 48, and 72 hours, and time to resume normal oral intake (days). Secondary outcomes included post-operative complications such as minor or major hemorrhage, infection, nausea, and vomiting.

**Data Collection:** Intraoperative parameters were recorded by an independent observer. Post-operative pain was assessed by nursing staff unaware of the surgical technique. Patients were followed daily until discharge and contacted on post-operative day 7 for follow-up.

**Statistical Analysis:** Data were analyzed using SPSS version 25. Continuous variables were expressed as mean ± standard deviation and compared using Student's t-test. Categorical variables were presented as frequencies and percentages and compared using Chi-square or Fisher's exact test as appropriate. A p-value <0.05 was considered statistically significant.

## RESULTS

### Demographic and Clinical Characteristics

A total of 70 patients were included in the study, with 35 patients in each group. The mean age of the electrocautery group was 18.4 ± 8.2 years, and for the cold dissection group it was 17.9 ± 7.5 years (p=0.72), showing no significant difference. The male-to-female ratio was 20:15 in the electrocautery group and 18:17 in the cold dissection group (p=0.65), indicating comparable gender distribution. Most patients (62%) were between 5–20 years, reflecting the predominance of pediatric cases. Indications for surgery were similar in both groups, with recurrent tonsillitis being the most common (*Table I*).

**Table I**
Demographic and Clinical Characteristics of Patients.

| Parameter | Electrocautery (n=35) | Cold Dissection (n=35) | p-value |
|---|---|---|---|
| Mean age (years) | 18.4 ± 8.2 | 17.9 ± 7.5 | 0.72 |
| Male:Female ratio | 20:15 | 18:17 | 0.65 |
| Indication: Recurrent tonsillitis | 25 (71%) | 26 (74%) | 0.79 |
| Indication: Obstructive sleep apnea | 10 (29%) | 9 (26%) | 0.79 |

### Operative Outcomes

The operative time was significantly shorter in the electrocautery group, averaging 28.3 ± 4.6 minutes, compared to 37.5 ± 5.2 minutes in the cold dissection group (p<0.001). Intraoperative blood loss was also markedly lower in the electrocautery group (35.7 ± 10.4 mL) versus the cold dissection group (72.5 ± 15.2 mL, p<0.001). These results indicate that electrocautery improves surgical efficiency and minimizes blood loss during tonsillectomy (*Table II*).

**Table II**
Operative Outcomes.

| Parameter | Electrocautery (n=35) | Cold Dissection (n=35) | p-value |
|---|---|---|---|
| Operative time (min) | 28.3 ± 4.6 | 37.5 ± 5.2 | <0.001 |
| Blood loss (mL) | 35.7 ± 10.4 | 72.5 ± 15.2 | <0.001 |

### Post-operative Pain

Post-operative pain was assessed using the Visual Analog Scale (VAS) at 6, 24, 48, and 72 hours. The electrocautery group experienced higher pain scores at all time points. At 24 hours, the mean VAS was 6.2 ± 1.1 in the electrocautery group compared to 4.8 ± 1.2 in the cold dissection group (p<0.001). By 72 hours, pain decreased in both groups but remained slightly higher in the electrocautery group (VAS 3.8 ± 0.9 vs 2.9 ± 0.8, p=0.004) (*Table III*).

**Table III**
Post-operative Pain (VAS Scores).

| Time after surgery | Electrocautery (VAS) | Cold Dissection (VAS) | p-value |
|---|---|---|---|
| 6 hours | 5.8 ± 1.2 | 4.5 ± 1.3 | <0.001 |
| 24 hours | 6.2 ± 1.1 | 4.8 ± 1.2 | <0.001 |
| 48 hours | 5.1 ± 1.0 | 3.9 ± 1.1 | <0.001 |
| 72 hours | 3.8 ± 0.9 | 2.9 ± 0.8 | 0.004 |

### Recovery Parameters

The mean time to resume normal oral intake was 4.5 ± 1.2 days in the electrocautery group and 3.2 ± 1.0 days in the cold dissection group (p=0.002), indicating faster recovery in the cold dissection group. All patients achieved full oral intake by day 7 (*Table IV*).

**Table IV**
Recovery Parameters.

| Parameter | Electrocautery (n=35) | Cold Dissection (n=35) | p-value |
|---|---|---|---|
| Time to resume oral intake (days) | 4.5 ± 1.2 | 3.2 ± 1.0 | 0.002 |

**Post-operative Complications**
Minor post-operative hemorrhage occurred in 2 patients in each group (5.7%). No major hemorrhage, airway complications, or readmissions were reported. There were no significant differences between groups regarding post-operative nausea, vomiting or infection (*Table V*).

**Table V**
Post-operative Complications.

| Complication | Electrocautery (n=35) | Cold Dissection (n=35) | p-value |
|---|---|---|---|
| Minor hemorrhage | 2 | 2 | 1.0 |
| Major hemorrhage | 0 | 0 | – |
| Post-op infection | 1 | 1 | 1.0 |
| Nausea/vomiting | 3 | 2 | 0.64 |

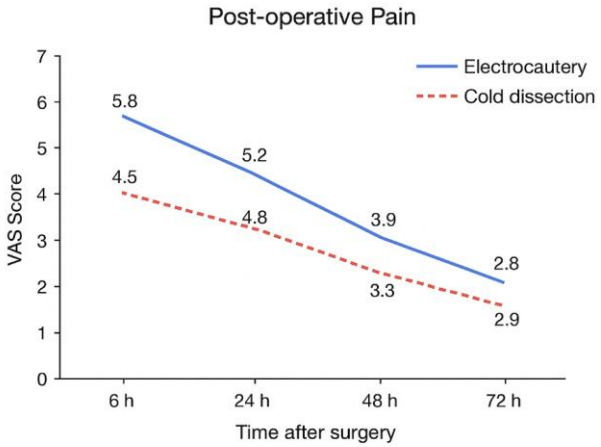


**Figure 1** Line graph of post-operative VAS scores over 6, 24, 48, and 72 hours for both techniques.

*Figure 1* shows line graph of post-operative VAS scores over 6, 24, 48, and 72 hours for both techniques.

## DISCUSSION

Tonsillectomy remains one of the most commonly performed procedures in otolaryngology, and the choice of surgical technique can significantly influence intraoperative and post-operative outcomes. This study compared electrocautery and cold dissection techniques in 70 patients, focusing on operative time, blood loss, post-operative pain, recovery and complications. Our results demonstrated that electrocautery tonsillectomy significantly reduced operative time (28.3 ± 4.6 min) compared to cold dissection (37.5 ± 5.2 min, p<0.001). This finding is consistent with prior studies reporting that the simultaneous cutting and coagulation offered by electrocautery enhances surgical efficiency. [1,2] Similarly, intraoperative blood loss was markedly lower in the electrocautery group (35.7 ± 10.4 mL vs 72.5 ± 15.2 mL, p<0.001), reflecting the hemostatic advantage of thermal coagulation over suture or ligature methods in cold dissection. [3,4] These advantages make electrocautery a preferred choice in cases with high bleeding risk or in pediatric patients where minimizing operative time is important. However, our study also observed higher post-operative pain in the electrocautery group across all time points. At 24 hours post-surgery, VAS scores averaged 6.2 ± 1.1 in the electrocautery group compared to 4.8 ± 1.2 in the cold dissection group (p<0.001). The increased pain is likely due to thermal injury to surrounding tissues, which causes greater inflammation and delayed mucosal healing. [5,6] In contrast, cold dissection, which relies on sharp dissection and minimal thermal damage, resulted in lower pain scores and faster recovery of oral intake (3.2 ± 1.0 days vs 4.5 ± 1.2 days, p=0.002). This observation aligns with previous research indicating that patients undergoing cold dissection experience less post-operative discomfort and resume normal diet earlier. [7,8] Both techniques demonstrated a favorable safety profile. Minor post-operative hemorrhage occurred in 2 patients in each group, and no major complications, airway compromise or readmissions were observed. These findings suggest that with skilled surgical technique, both methods are safe and the choice can be guided by clinical priorities such as operative efficiency versus patient comfort. [9-14] The study highlights the trade-off between surgical efficiency and post-operative morbidity. Electrocautery provides reduced operative time and intraoperative bleeding but may increase immediate post-operative pain. Cold dissection offers lower pain and faster recovery at the cost of longer surgery and higher blood loss. Surgeons should individualize technique selection based on patient age, comorbidities, pain tolerance and resource availability. Limitations of this study include its single-center design and relatively small sample size which may limit generalizability. Additionally, long-term outcomes beyond one week such as delayed hemorrhage or functional recovery were not assessed. Future multicenter, randomized trials with larger cohorts and longer follow-up are recommended to validate these findings.

## CONCLUSION

Electrocautery tonsillectomy provides faster surgery and less intraoperative blood

loss but is associated with higher post-operative pain and slightly delayed dietary recovery. Cold dissection, though longer and more hemorrhagic intraoperatively, promotes faster recovery and reduced pain. The choice of technique should be tailored to patient and surgical priorities.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this study.

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