# Comparative Study of Post-operative Pain Following Bipolar Diathermy and Cold Dissection Tonsillectomy

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Tonsillectomy is one of the most frequently performed operative procedures mainly aimed to remove tonsils with less post-operative pain and haemorrhage. There are several existing techniques to perform tonsillectomy, including cold dissection, guillotine excision, cryosurgery, ultrasonic removal, laser tonsillectomy and bipolar diathermy. Ideally the procedure to be employed should be fast, safe, painless, and bloodless, and associated with rapid recovery. A prospective observational study was done on 100 tonsillectomy patient between the age from 5 to 27 years. This study was aims to compare the cold dissection and bipolar diathermy tonsillectomy in terms of post-operative pain. The study was done from July 2014 to June 2015 at Kishoreganj 250 Bedded General Hospital. The patients were randomly selected to have either the right or left tonsil removed by using bipolar diathermy or cold dissection method. Out of 100 patients 66% were male and 37 % were female. On the first post-operative follow up the pain was significantly increased in the bipolar diathermy side compare to cold dissection side 27% versus 12% but no significant difference of pain from 2nd to 10th post-operative days on both sides. It can be concluded that Bipolar diathermy tonsillectomy is a safe technique which significantly reduces the operative time and per-operative blood loss but it causes more post-operative pain in 1st post-operative day.

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**Key words:** Tonsillectomy, post-operative pain.

## Introduction

In Bangladesh tonsillitis is a common disease in clinical practice. Between the two types of tonsillitis (Acute and Chronic) chronic variety is the most common and tonsillectomy is the safe treatment for chronic tonsillitis. Tonsillectomy is one of the most frequently performed operation in Bangladesh and world wide.[1] Post-operative pain and haemorrage are issues that are usually discussed when comparing different types of tonsillectomy. To date there is no conclusive evidence in the literature as which surgical technique is best for performing tonsillectomy.[2] Cold dissection tonsillectomy is currently most common method in Kindom of Saudi Arabia.[3] Bipolar diathermy methods are increasingly being used for tonsillectomy.[4] The use of bipolar diathermy in tonsillectomy was first introduced by Haase and Noguera and Johnson.[5]

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There have been an increasing number of trials to assess the various aspects of these different tonsillectomy. Some of these studies concluded that the diathermy technique was associated with less intraoperative blood loss with no measurable increase in postoperative morbidity compared to the dissection technique.[6]

However, the main disadvantage of electrodissection tonsillectomy is the delayed healing of wound and relive of pain. Though both of this were less in dissection method.[7] In cold dissection method bleeding were controlled by no 1 silk ligature. Here we compared between two techniques interms of operative times, peroperative bleeding, postoperative pain and haemorrhage.

**Methods**

This study included 100 patients who underwent tonsillectomy between July 2014 and Jun 2015. This study was carried out at 250 Bedded District Hospital, Kishoreganj. Patients were randomly selected to have either the right or left tonsils removed by either technique (cold dissection or bipolar dissection technique). We compared both techniques in each side on the same patient.

Patient between the age 5 and 27 years were included for tonsillectomy. Patients with acute tonsillitis and those with bleeding disorders were excluded from this study. Preoperatively, cases had routine blood studies including a complete full blood count, bleeding time and clotting time. The patients were informed that each one of the tonsils would be removed by either method, however, they were unaware of which technique was to be used for which side. All tonsillectomies were performed under general anesthesia.

The patients were randomly selected to have either the right or the left tonsils removed using the electrodissection bipolar technique or cold dissection technique. The cold dissection method used blunt dissection with braided by No 1 silk for hemostasis. The electrodissection utilized the bipolar technique, power of 25 Watts, throughout the whole procedure.

Initially the mucosa at the medial margin of the anterior tonsillar pillar was breached with bipolar diathermy and then, continue the dissection around the tonsillar capsule. The time taken for the operation was recorded separately for each side; this was calculated from the beginning of the actual operation (namely, holding the tonsils with tonsil holding forceps) until the attainment of satisfactory hemostasis on the operated side. Intraoperative blood loss was estimated in milliliters by the surgeon and the operating room staff for each side, and by actual measurement of blood in the suction bottle. The patients were prescribed standard regular postoperative doses of analgesics, as well as antibiotic (cefuroxime) for 7 days to reduce the postoperative morbidity. Patients were discharged on the next day after surgery in all cases. Parents were given a diary card to record from day one to 10, diet, severity of pain, as well as the side of maximum pain, temperature, blood mixed saliva .The nurse recorded the pain in the first 24 hours. On the 10th postoperative day the patients were interviewed regarding pain, temperature, blood mixed saliva and underwent examination, and the diary cards were collected.

**Results**

One hundred patients participated in this study, their age ranged between from 5 to 27 years, with a mean age of 10.37 years. Sixty-three (63%) were males and 37 (37%) were females. The bipolar technique was used on the right side in 81 patients and on the left side in 19 patients. The cold technique was

used on the right side in 50 patients and on the left side in 50 patients. Intraoperative blood loss was minimal with the electrocautery dissection technique, averaging 25.37 ml (range 0-60ml). Cold dissection tonsillectomy resulted in an average of 88.45 ml blood loss per side (range 20-240ml).The mean operative time for bipolar dissection was 5.51 minutes (ranging 3-12 years) and for cold dissection the mean was 7.02 minutes (ranging between 4-15 minutes).The difference in time by either techniques was not statistically significant (*p*=0.0816). However, when the patients were grouped into <5 minutes and >5 minute operative times, the results indicated that a greater number of patients were operated in <5 minutes by the diathermy procedure compared with the dissection method (67 versus 44 cases) (Table I).This difference was statistically significant, *p*=0.0011. On the first postoperative day, the pain was significantly increased in the diathermy side compared to cold dissection side 27% versus 12% (*p*=0.0151). While in the first 24 hours and from the 2nd day until the 10th postoperative day, there was no significant difference in pain between both sides (Table II) The overall incidence of reactionary hemorrhage (occurring within first 24 hours after surgery) was 2% (2 cases), one had bleeding from both sides, and the second case had bleeding from the dissection side. All settled with conservative local management. There was more slough tissue present on the diathermy side compared to the cold dissection side (18% versus 3%) at the 10th postoperative day, this difference was statistically significant (p=0.0008). There was little difference in operative time between both sides Blood loss was minimal with the diathermy technique; averaging 25.37 ml compared to88.5 ml for cold dissection tonsillectomy.

Table I: The distribution of the patients according to operative time and tonsillectomy technique

| Operative time in minutes per tonsil | Number of patients | |
|---|---|---|
| | dissection | diathermy |
| Less than 5 min | 4 | 54 |
| More than 5 min but less than 7 min | 73 | 38 |
| More than 7 min but less than 10 min | 16 | 6 |
| More than 10 min | 7 | 2 |

Table II: Showing the distribution of the patient according to the side of maximum throat pain during the postoperative period

| Time after procedure | Throat pain | | | | |
|---|---|---|---|---|---|
| | Equal on both side (n) | Worse on dissection side n (%) | Worse on diathermy side n (%) | No pain (n) | *P* |
| First 24 hours | 72 | 11 (11) | 17 (17) | 0 | NS |
| Day One | 61 | 12(12) | 27(27) | 0 | 0.0151 |
| Day 2 | 65 | 16(16) | 19(19) | 0 | NS |
| Day 3 | 53 | 22(22) | 25(25) | 0 | NS |
| Day 4 | 55 | 23(23) | 22(22) | 0 | NS |
| Day 5 | 42 | 26(26) | 29(29) | 3 | NS |
| Day 6 | 37 | 31(31) | 26(26) | 6 | NS |
| Day 7 | 20 | 26(26) | 29(29) | 25 | NS |
| Day 8 | 19 | 17(17) | 18(18) | 46 | NS |
| Day 9 | 17 | 4(4) | 6(6) | 73 | NS |
| Day 10 | 16 | 3(3) | 4(4) | 77 | NS |

NS – not significant

## Discussion

Ideally, tonsillectomy should be quick, painless, and associated with no blood loss. In reality, however the morbidity of tonsillectomy may be significant. Two surgeons should select the technique that, in their own hands, offers the minimum morbidity. Pain is the most common problem after tonsillectomy.[8] Nunez et al[9] also reported that pain was the most common reason for seeking out patient medical

attention in the first 2 weeks after tonsillectomy. Most investigators found no significant difference in pain during the first 24 hours after surgery between the hot and cold methods.[2,3,8,10] Tay,[8] on the other hand, reported significantly less pharyngeal pain on the electrodissection side in the first postoperative day in adult patients. Our study supports the finding of Waxler et al,[11] that there is less pharyngeal pain on the cold dissection side in the first postoperative day in pediatric patients. Our study showed no significant difference in pain between both sides in the first 24 hours, and from the 2nd day until the 10th postoperative day. However, other studies reported significantly more pain during postoperative days 4-10 with electrodissection tonsillectomy. 13 Intraoperative blood loss was less with the hot technique in our study, agreeing with previous studies.[11] The postoperative bleeding showed insignificant difference between the 2 techniques. Across all previous studies, very few patients had postoperative bleeding, and there were no meaningful differences between the cold and hot techniques. 13 Weimert et al,[3] noted a decrease in operative time by using the cautery technique, average 2.5 minutes for the cautery side and 6 minutes for dissection/snare side. Mann et al, [10] noted an average of 10.1 minutes for the cautery side and 12.4 minutes for the dissection side. However, Leach et al reported a decreased operative time with the cold technique, (13.5 versus 9.9 minutes).[2] In contrast, our average time for electrodissection was not significantly less in comparison with the cold dissection side (7.02 versus 5.51 minutes); perhaps some of the resident trainees involved in the present study had more experience with the cold dissection technique. However, when we split the patients into < 5 minutes and >5 minute groups, there were significantly higher numbers of patients operated up on in <5 minutes by diathermy compared to the dissection technique ($p<0.05$). From our findings clearly bipolar diathermy is a faster technique for tonsillectomy, offering a better hemostasis intra-operatively, and is not associated with increased postoperative hemorrhage. Our study supported the fact that there is no significant increase in postoperative pain with this technique, except during the first postoperative day. In conclusion, the bipolar diathermy technique significantly reduces the operating time and intraoperative blood loss, however, causes more pain on the postoperative days when compared with the cold technique.

*Conclusion*

I should be mentioned here that this study had been carried out over a limited period of time comprising of a limited number of cases. From this study it can be concluded that bipolar dissection tonsillectomy is a safe technique. It significantly reduces the operative time and intraoperative blood loss. However, it causes more pain and burning sensation on the 1st postoperative day upto 10th post operative day. There was significant difference in pain between two sides, which were done by bipolar diathermy and cold dissection method. Saudi Med J 2007; Vol. 28 (10):

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