



TONSILLECTOMY IN PAEDIATRIC POPULATION; COMPARISON OF BIPOLAR ELECTROCAUTRY AND COLD DISSECTION METHOD

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INTRODUCTION

Tonsillectomy is one of the commonest otolaryngological procedure performed representing approximately 20%-40% of surgical procedures performed in this field.¹ The first known tonsillectomy was performed by Cornelius Celsus with fingernails 2000 years ago.² The earliest description of the procedure was by Paul of Aegina in 625. In the mid-eighteenth century Caque of Rheims performed tonsillectomies on a regular basis.³

Tonsillectomy has a post-operative course which encompasses significant morbidity and potential complications. Throughout the years, investigators and surgeons have developed new techniques for tonsillectomy aiming to decrease

ABSTRACT... Objectives: To compare mean operative time and Intra operative blood loss between bipolar electro dissection and cold dissection tonsillectomy in paediatric population. **Study Design:** Randomized controlled trial. **Place and Duration:** Department of ENT and Head and Neck Surgery, Continental Medical College, Hospital Lahore, from 1 January 2015 to 30 September 2015. **Materials and Methods:** This study included 164 patients of age group 4 to 12 years of either gender undergoing tonsillectomy. The patients were divided into two equal groups designated as A and B each having 82 patients using simple random sampling. Patients in group A were operated for tonsillectomy by bipolar electrocautry while group B underwent tonsillectomy by cold steel dissection method. All patients in both groups were assessed for operating time and intra-operative blood loss. **Results:** Out of 82 cases of Bipolar Dissection Group 49(60%) patients were male and 33(40%) patients were female. Whereas in 82 cases of Cold Dissection Group 51(62%) patients were male and 31(38%) patients were female. Mean age of patients was 7.2(SD \pm 1.97) years. Mean operation time was 15 minutes with standard deviation \pm 1.21 in group A as compared to group B where mean operation time was 20 minutes with standard deviation \pm 1.87. Mean blood loss was 7 ml with standard deviation \pm 2.53 in patients of group A as compared to Patients in group B who mean blood loss of 30 ml with standard deviation \pm 3.46. Group A had statistically significant lower operative time and blood loss than group B. **Conclusion:** Tonsillectomy with bipolar electro dissection method is much better than cold steel dissection method. It has an advantage of less blood loss during surgery. It significantly reduces intra operative time.

Key words: Operative time, blood loss, Bipolar electro dissection, cold dissection, tonsillectomy.

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post-operative morbidity and complications. Ideally, tonsillectomy should be fast, bloodless and associated with rapid and uneventful recovery.⁴

Various surgical procedures are used to perform this operation, including blunt dissection, guillotine excision, electrocautry, cryosurgery, coblation, ultrasonic removal, laser removal, monopolar and bipolar dissection, thermal welding tonsillectomy and ligature tonsillectomy.⁵ These techniques have evolved over the years aiming to make the procedure safe and decrease the postoperative morbidity and complications. Two most commonly used techniques are cold dissection and electro dissection.⁶ The most common technique used for removing tonsils in the United States today is

electrocautry, also called a “hot” tonsillectomy, but cold dissection tonsillectomy is currently the most common method of tonsillectomy in the UK.⁷

There remains debate as to the optimal method with the least patient morbidity. The use of electrocautry during tonsillectomy has been common practice since 1930.⁸ After the advent of non-explosive mixtures electrocautry usage became common with general inhalation anesthesia. Electrocautry tonsillectomy with a monopolar blade allows minimal blood loss and a short operating time because simultaneous bleeding control and tissue dissection are possible.⁹ However, it is reported to cause relatively more severe post-operative pain and delayed wound healing than conventional cold tonsillectomy. These complications are due to the thermal tissue damage caused by temperature that reach 300°C. However bipolar electrocautry causes much less surrounding tissue injury as compare to monopolar cautery and is said to be superior in terms of peri-operative bleeding, operative time, post-operative pain and morbidity after tonsillectomy.¹⁰

This study was undertaken in an attempt to compare the techniques of bipolar electrocautry and cold steel dissection in tonsillectomy. Details about intra-operative blood loss, and operative time were sought.

MATERIALS AND METHODS

This was a randomized control trial conducted at department of ENT and head and neck surgery Continental Medical College, Hospital Lahore, from 1 January 2015 to 30 September 2015. After taking approval from hospital ethical committee study was carried out. Patients between 4 and 12 years of age of either sex meeting the inclusion criteria and presenting with recurrent acute tonsillitis, with more than 6-7 episodes in one year or 5 episodes per year in two consecutive years, or three episodes per year for three years were admitted through out-patient department.

The exclusion criteria were: patients undergoing

unilateral tonsillectomy, those patients with deranged clotting profile, patients undergoing adenotonsillectomy and those with suspicion of malignancy. The purpose and benefits of the study was explained to all patients and if agreed upon a written informed consent was obtained.

The patients were randomly allocated in two groups A and B by using random table. Patients in Group-A were operated by Electro dissection method and in Group-B by Cold dissection method. A detailed history was taken and general physical along with ear, nose and throat examination was carried out. Routine laboratory investigations like complete blood picture, bleeding time, clotting time, hepatic viral serology, PT, APTT was done. Radiological investigations include chest X-ray was included in this study. The operative time was started from fixation of Boyel-Devis mouth gag to a Draffins bipod till homeostasis is secured and was measured by using stop watch, the amount of blood loss was measured by using a standard gauze piece of size 19cm×14cm i-e fully soaked gauze piece contains 4ml of blood and partially soaked gauze piece contains 2.5ml of blood. Both operative procedures were done under general anesthesia and by single expert ENT surgeon.

All the data was analyzed using the statistical package for social sciences version 18. Mean ± SD was calculated for numerical variables like age, intraoperative blood loss and operative time. T-Test was used to compare the operative time and intraoperative blood loss between the groups. While keeping P value of ≤0.05 as significant. All results were presented in the form of tables and graphs.

RESULTS

Out of 82 cases of Bipolar Dissection Group 49(60%) patients were male and 33(40%) patients were female. Where as in 82 cases of Cold Dissection Group 51(62%) patients were male and 31(38%) patients were female (as shown in Table-I) Mean age of patients was 7.2(SD ± 1.97) years.

GENDER	Group A	Group B	Total
	Bipolar Dissection	Cold Dissection	
Male	49(60%)	51(62%)	100
Female	33(40%)	31(38%)	64
Total	82	82	164

Table-I. Gender distributions (n=164)

Stratification of mean operation time among two groups was analyzed as in 82 cases of Bipolar Dissection Group 70(85.4%) patients had operation time ranged 10-20 minutes, 12(14.6%) patients had operation time ranged 21-30 minutes. Mean operation time was 15 minutes with standard deviation ± 1.21. Where as in 82 cases of Cold Dissection Group 49(59.8%) patients had operation time ranged 10-20 minutes, 33(40.2%) patients had operation time ranged 21-30 minutes. Mean operation time was 20 minutes with standard deviation ± 1.87. (as shown in Table-II)

Mean Operation Time	Group A	Group B	Total
	Bipolar Dissection	Cold Dissection	
10-20 minutes	70(85.4%)	49(59.8%)	119
21-30 minutes	12(14.6%)	33(40.2%)	45
Total	82	82	164
Mean and SD	15 minutes ± 1.21	20 minutes ± 1.87	

Table-II. Mean operation time (n=164)

Stratification of blood loss among two groups was analyzed as in 82 cases of Bipolar Dissection Group 45(54.9%) patients had blood loss ranged 5-10 ml, 33(40.2%) patients had blood loss ranged 11-20 ml, 4(.9%) patients had blood loss ranged 21-30 ml. Mean blood loss was 7 ml with standard deviation ± 2.53. Where as in 82 cases of Cold Dissection Group 10(12.2%) patients had blood loss ranged 5-10 ml, 19(23.2%) patients had blood loss ranged 11-20 ml, 35(42.7%) patients had blood loss ranged 21-30 ml and 18(22%) patients had blood loss ranged 31-40 ml. Mean blood loss was 30 ml with standard deviation ± 3.46. (as shown in Table-III)

Mean Blood Loss	Group A	Group B	Total
	Bipolar Dissection	Cold Dissection	
5-10 ml	45(54.9%)	10(12.2 %)	55
11-20 ml	33(40.2%)	19(23.2%)	52
21-30 ml	4(4.9%)	35(42.7%)	39
31-40 ml	00(0%)	18(22%)	18
Total	82	82	164
Mean and SD	7 ml ± 2.53	30 ml ± 3.46	

Table-III. Blood loss (n=164)

DISCUSSION

The most frequently performed procedure in otolaryngology is tonsillectomy. There are many ways to perform tonsillectomy.¹¹ However; cold steel dissection method remains the most standard technique for tonsillectomy. Although there are so many new techniques available for tonsillectomy with significant advantages over traditional techniques. One of the latest popular techniques is bipolar electrocautery dissection method with advantage of less intra operative bleeding and quick dissection.¹²

Bipolar electrocautery is safer as electric current passes between the two prongs of the electrodes without any significant flow through the patient. There is less tissue damage in bipolar electrocautery. It can be used in patients with implanted devices to prevent electrical current passing through the device causing a short circuits or misfire.^{13,14} The cutting action of bipolar electrosurgery is based upon molecular resonance. This system function in a dry or wet field as a result charring, thermal artifacts are not seen.

Bipolar electrocautery is used for tonsillectomy with significant advantage of less intra-operative bleed and less operative time. Our study is designed to compare mean operative time and intra-operative bleed loss between bipolar electro dissection and cold steel dissection tonsillectomy.

According to our study mean intraoperative time with bipolar electrocautery was 15 minutes as compared to cold steel dissection method where it was 20 minutes. In our study intraoperative blood loss in bipolar electrocautery dissection

was 7ml as compared to cold dissection method 30 ml. These results were reproduced by some other study carried out by Shah SA and Ghani R¹⁵ who describe intraoperative blood loss of 4 ml and 10ml respectively in bipolar electrocautry dissection method, clearly indicating bipolar electrocautry dissection is better than cold steel dissection method.

Regarding operative time, bipolar electrocautry dissection method less time as compared to cold dissection According to our study mean intraoperative time with bipolar electrocautry was 15 minutes as compared to cold steel dissection method where it was 20 minutes n. Similar results were stated in some other study conducted by Gendy S et al less time in bipolar electrocautry dissection group is mainly because of immediate coagulation as compared to cold dissection method where more time is consumed first in packing of tonsillar fossa and use of monopolar coagulation for securing hemostasis.¹⁶

In a study carried out by Robert F et al where they compare electrocautry dissection with other techniques of tonsillectomy he found that electrocautry results were better in intraoperative and post operative period. It is also a cost effective technique for tonsillectomy.¹⁷

Pajic-Penavic, Danic D compare conventional tonsillectomy with new technique of tonsillectomy. He found that there is statistically and clinically significant decrease in operating time in tonsillectomy with electrocautry. The loss of blood was minimal in this technique as compared to cold dissection method.¹⁸

CONCLUSION

Bipolar electro dissection tonsillectomy is an effective and safe technique of tonsillectomy, especially in children population. It offers several advantages in terms of shorter operating time and minimal intraoperative blood loss. Selective and appropriate use of diathermy, avoiding excessive thermal damage to the tonsillar bed may help in ensuring less postoperative pain. Adequate experience with the technique is mandatory to

achieve the desired goals.

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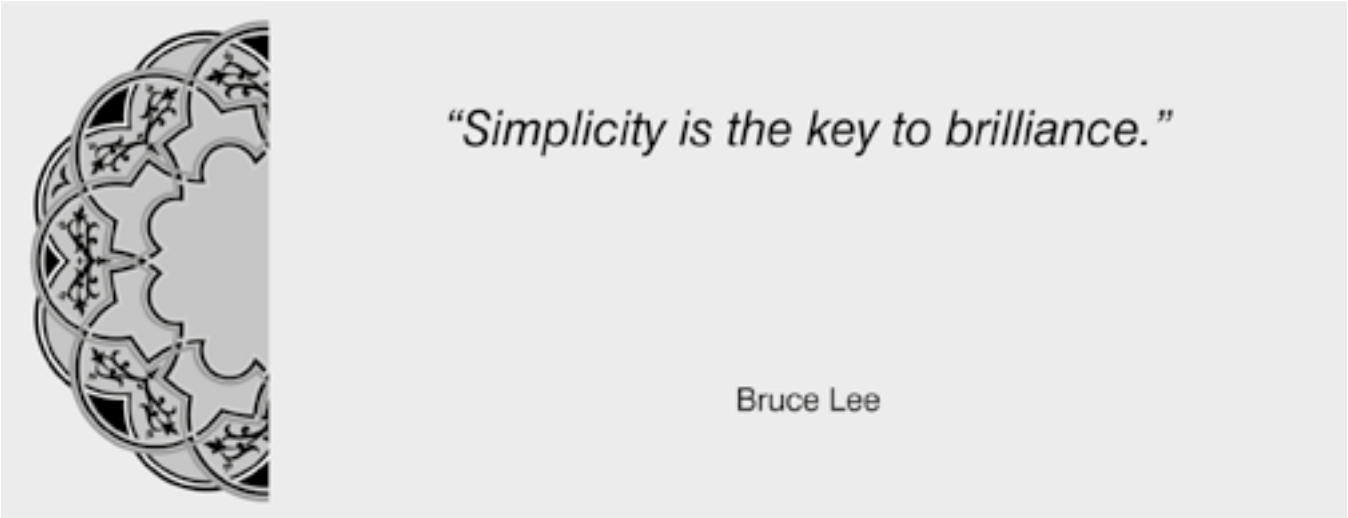
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