Original Article

Comparison Between Bipolar Diathermy and Silk Ligation Technique During Tonsillectomy

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ABSTRACT

Objective: Comparison of post operative hemorrhage and operative time by using diathermy and silk ligation during tonsillectomy for intra operative hemorrhage control, in Pakistan.

Study Design: Randomized controlled trail study.

Place and Duration of Study: This study was conducted at the Otorhinolaryngology Department of Nishtar hospital, Multan from June 2016 to December 2018.

Materials and Methods: Patient selection was in accordance with inclusion and exclusion criteria. Two groups A and B were made and patients were randomly allottedthe group. Intra operative hemostasis was done by bipolar diathermy and suture ligation in group B and A respectively. SPSS software was utilized for comparison and analysis of data.

Results: Younger patients below the age of 15 constituted the majority of patients in both group A (54.70 percent) and group B(55.56 percent). In our study, males were predominant (n=167) and the rest (n=67) were females. Use of bipolar diathermy cut the time of operation to almost half in the group B compared to the use of silk ligation as hemorrhage control in group A and that difference is statistically significant with the p value of less than 0.0001. In contrast to the intra operative time benefit, use of bipolar diathermy associates with much higher incidence of secondary hemorrhage(n=12 in group B) than suture ligation (n=03)and this incidence was statistically significant (p= 0.016).

Conclusion: Though it is time consuming but use of silk ligation is safer and associated with less chances of post operative secondary hemorrhage compared to diathermy, when used in hemostasis during tonsillectomy.

Key Words: Post operative secondary hemorrhage, tonsillectomy, bipolar, silk ligation, diathermy, time of operation.

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INTRODUCTION

Tonsillectomy stands to be one of the ancient, controversial and a common childhood surgical procedure[1]. Recent revolution of technology has led to an ongoing debate about the best method, technique and instruments used in tonsillectomy. Out of many parameters like duration of procedure, easy availability of instruments, post op pain, hospital stay, control of haemorrhage is a major parameter used to distinguish the best technique available[2,3].

Despite enjoying a probable distinguished position in body immune system in childhood, recurrent infection, apnea, enlarge size causing hindrance in swallowing, speech, breathing and Eustachian tube dysfunction leave us with the only choice of tonsillectomy[3,4]. After narration of recent technique of dissection by Worthington - Waugh and diathermy(electro-dissection) by Remington-Hobbs for tonsillectomy, we have indulged in to an ongoing discussion about the best technique[2,5,6]. Though harmonic scalpel, cryosurgical technique, electrocautery, coblation, plasma mediated ablation, debrider and laser use in the tonsillectomy have aided to the ongoing debate of best technique but cold dissection snare with ligation for heamorrhage control and bipolar diathermy enjoys the reputation of being most debated techniques[7-9].

Though tonsillectomy is a simple and common procedure but still it is categorized as major surgical procedure owing to the risk of postoperative haemorrhage and anaesthesia complications[10]. The intraoperative and postoperative considerable loss of blood is reported in up to 18% and 10% of cases respectively[11]. Mortality in tonsillectomy, rarely reported, is related mostly to the heamorrhage[12]. Diluted adrenaline, silver nitrate and tannic acid have been used tropically for the containment of

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postoperative bleeding[13]. EACA (epsilon amino caproic acid) is associated with considerable decrease in intraoperative blood loss[14]. Moreover, the fear of life threatening blood loss during surgery has led us to use bipolar diathermy, laser, ionic cobalation and cryosurgery.

MATERIALS AND METHODS

After approval of ethical committee, study was conducted in otorhinolaryngiology department of Nishtar hospital, Multan extending from June 2016 to December 2018. A total number of 234 patients of 5 to 35 years of age were selected who were admitted in ENT department with chronic tonsillitis. Patients with chronic tonsillitis who had at least 4 acute exacerbationsin a year and those with hypertrophic tonsils causing obstructive symptoms were included in our study. Patients with acute tonsillitis, acute respiratory infection, bleeding disorders, uncontrolled medical illness, eagle syndrome, malignancy and those who were not willing to be included in study were excluded. Proper ENT examination and baseline investigations (like complete blood count, viral markers by screening, PT and APTT, x-ray nasophyranx, ECG) were done for each patient. After informed consent, group A and Bwere made and patients were randomly allotted these two groups. General anesthesia was used in all the patients undergoing tonsillectomy. Suture ligation was used in group A and bipolar diathermy in group B for hemostasis during tonsillectomy. Both groups were observed post-operatively and follow up was done after 2 weeks. All the information (mean operative time, complain of secondary hemorrhage) was recorded on a pre-designed Performa. SPSS software was utilized for comparison and analysis of data. Frequency and percentage was calculated for categorical variables. Stratification was used to control age and gender like effect modifiers and Chi-square test was applied to see effect of these on secondary hemorrhage and t test was applied to see their effect on mean operative time. P value of < 0.05 was considered significant.

RESULTS

Age range in this study was from 5 to 35 years with mean age of 13.84 ± 5.83 years. the mean age of patients in group A was 13.58 ± 5.32 years and in group B was 12.97 ± 5.75 years. As shown in table 1, younger patients of less than 15 years of age constituted a majority of patients 129 (55.13%) with a decline in number of patients in older age groups. Male were predominant (n=167, 71.37%) compared to females 67 (28.63%) with the ratio of 2.49:1(Figure 1).

Use of bipolar diathermy cut the time of operation to almost half in the group B compared to the use of silk ligation as hemorrhage control in group A and that difference is statistically significant with the p value of less than 0.0001(figure 2). In contrast to the intra operative time benefit, use of bipolar diathermy associates with much higher incidence of secondary hemorrhage (n=12 in group B) than suture ligation (n=03) and this incidence was statistically significant (p= 0.016) as shown in Figure VII. Stratification of age of patients and gender with respect to operative time has shown in Table II & III respectively while Table IV & V have shown stratification of age and gender respectively with respect to secondary hemorrhage in both groups.

Table No.I: Age distribution for both groups (n=234):

Age (years)	Group A		Group B		Total (n=234)	
	No. of patients	%age	No. of patients	%age	No. of patients	%age
5-15	64	54.70	65	55.56	129	55.13
16-25	33	28.21	34	29.06	67	28.63
26-35	20	17.09	18	15.38	38	16.24
Mean ± SD	13.58 ± 5.32		12.97 ± 5.75		13.84 ± 5.83	

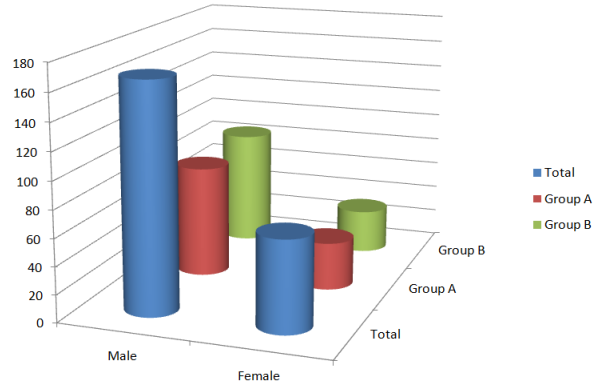

Figure No.1: Graph of patients according to Gender (n=234)

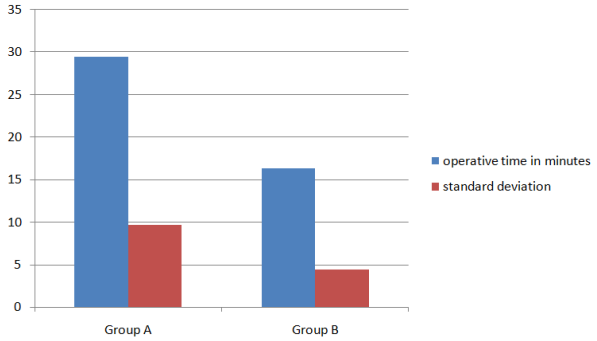

Figure No.2: Mean Operative Time in both groups

	Group A	Group B
Mean	29.45	16.37
Standard deviation	9.71	4.38

p-value <0.0001 which is statistically significant.

DISCUSSION

To minimize the morbidity and complications associated with tonsillectomy, lot of techniques have been developed each with a unique set of benefits and disadvantages. Despite of these benefits, no single technique has enjoyed the title of being universally acceptable[15]. The variability of operating time, intra as well as post operative hemmorhage, hospital stay, postoperative pain and resumption of routine activities are the set points and basis for the evaluation of different techniques and topic of debate for research purposes.

Our present study was done for the purpose of comparing ligation and bipolar diathermy in contrast of time consumption in operation and risk of secondary hemorrhage. Moreover, it also shed a light on age distribution of tonsillectomy and gender distribution. Younger patients of less than 15 years of age constituted a majority of patients 129 (55.13%) with a decline in number of patients in older age groups, in this study. As for as gender distribution was concerned, 71.37% were male and 28.63% were females with ratio of 2.49:1. In comparison to our study, sheikh s et al has reported majority of the tonsillectomies in the same age distribution but her findings regarding gender distribution showed higher incidence in females (57.5%) compared to males[2] Similar to our study, khan AR et al reported high incidence of tonsillectomy in males (72.22%) and he attributed this higher incidence with possibility of male dominating society[15].

In the present study, Use of bipolar diathermy cut the time of operation to almost half in the group B compared to the use of silk ligation as hemorrhage control in group A and that difference is statistically significant with the p value of less than 0.0001. Pang[16], Kirazli et al[17]. Silveira et al[18], Raut et al[19] and Blomgren et al[20] reported that electro dissection tonsillectomy was associated with considerable reduction in operative time owing to its potential of simultaneous dissection of tonsils with coagulation of bleeding points. In contrast to our study, studies conducted by Kujawski[21] and Lassalelta et al[22] showed no significant difference between operating time of both groups.

In our current study, In contrast to the intra operative time benefit, use of bipolar diathermy associates with much higher incidence of secondary hemorrhage (n=12 in group B) than suture ligation (n=03) and this incidence was statistically significant (p= 0.016). In contrast to our study, Pang YT[16] and Stephen O'Leary et al[23] concluded that difference between the post operative hemorrhage of both groups had no statistical significance. However, Gendy S[6], Lowe D et al[24], Raut et al[25], Weimert et al[26] and Tay H L[27] reported a considerably increased risk of secondary hemorrhage in electro dissection (diathermy) group of tonsillectomy compared to the cold dissection group. Frequent touch, high power and increase application time leading to excessive thermal damage might give a clarification of association of diathermy with increase secondary hemorrhage[28].

CONCLUSION

In tonsillectomy, electro dissection (bipolar diathermy) use for hemostasis is a fast technique associated with significant decrease in operative time compared to the silk ligation technique. But as far as the chances of secondary hemorrhage are concerned, a significant rise was seen in bipolar diathermy group compared to silk ligation group. So, trainee should also master the technique of silk ligation in tonsillectomy.

Author's Contribution:

Concept & Design of Study:	Muhamad Saleem Sheikh
Drafting:	Mohammad Sharif Shahid
Data Analysis:	Sanaullah Bhatti, Mohammad Hassan Nisar
Revisiting Critically:	Muhamad Saleem Sheikh, Mohammad Sharif Shahid
Final Approval of version:	Muhamad Saleem Sheikh

Conflict of Interest: The study has no conflict of interest to declare by any author.

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