



LIGATION VERSUS BIPOLAR DIATHERMY FOR HAEMOSTASIS IN TONSILLECTOMY- A RANDOMISED CONTROL STUDY

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ABSTRACT

Introduction: Tonsillectomy is one of the commonest procedures performed in Otorhinolaryngology. Hemorrhage still remains one of the dreaded complications of the procedure. **Materials & Methods:** We did a Randomized control study, conducted on 60 patients who underwent tonsillectomy at our institute. Dissection tonsillectomy was performed in all cases. Bipolar diathermy was used to control hemorrhage in group A, while Ligation was used to arrest hemorrhage in the group B. Blood loss, time spent in surgery, post operative pain were the parameters considered. **Observations & Results:** 37(61%) females and 23 (39%) males participated in the study. Majority patients were in 11-20 age group. Mean blood loss was 78.16 ml in the cautery group and 82.02 ml in the ligation group. (p value = 0.91) and was found no statistically significant. Mean time taken was 59.00 minutes in the cautery group and 55.00 minutes in the ligation group (p value = 0.348). Secondary hemorrhage was not occurred in both groups. **Conclusion:** Though bipolar diathermy did not make a statistically significant difference in the surgical outcome of amount of blood loss in our current study, however there was less blood loss compared to ligation group but which is statistically not significant, and also seen better clinical improvement in patients of group A (hemostasis by bipolar diathermy) compared to group B (hemostasis by ligation).

KEYWORDS

Ligation, Bipolar Diathermy, Hemostasis, Tonsillectomy,

INTRODUCTION

Tonsillectomy is a very common surgery performed by ENT surgeons, usually safe, simple, and uncomplicated. The first known tonsillectomy was performed by Cornelius Celcus almost 2000 years ago. Modern tonsillectomy began in the earlier years of this century with the development of dissection tonsillectomy in Baltimore by Worthington (1907), in London by Waugh (1909), and Guillotine tonsillectomy in New Castle by Whillis and Pybus (1910)³⁸. The recent revolution in technology has led to an ongoing debate about the best methods, techniques, and instruments used in tonsillectomy. Out of many parameters like duration of procedure, easy availability of instruments, post op pain, hospital stay, and control of hemorrhage, this is a major parameter to distinguish the best technique available. Effective hemostasis is a very important part of tonsillectomy, and unsuccessful hemostasis can lead to persistent hemorrhage that can lead to shock, increased operating time, aspiration of blood, and a delay in the healing process. Electrocautery and suture ligation are the two most commonly used methods of controlling hemorrhage during and after tonsillectomy, with variable results¹.

MATERIALS AND METHODS

Study Design - It is a Randomized control study.

Method Of Randomization:

Simple randomization done using computer generated random table into

Group A: Patient will undergo Bipolar Diathermy for hemostasis

Group B: Patient will undergo Ligation for hemostasis.

Study Period: 18 months

Inclusion Criteria:

1. The patients between age group of 5 to 35 years, with chronic tonsillitis, presents to ENT OPD willing for undergoing tonsillectomy. After getting written informed consent from patients and assent from the parents of patient under 18 years of age.

Exclusion Criteria:

1. Patient with bleeding disorders
2. Patient with co-morbidities (DM/HTN/CKD, etc.)
3. Prior peritonsillar abscess
4. Undergoing tonsillectomy as a part of other procedures

Sample Size Estimation

Sample size estimation was done using Open EpiSoftware Version 2.3.1.

At 95% confidence level, and 80% power of the study

α (two-tailed) = 0.050 and at 95% confidence level.

β = 0.200 and 80% of power of the study

Where $Z\alpha$ = standard table value for 95% CI = 1.96

$Z1-\beta$ = Standard table value for 80% Power = 0.84

Based on previous study Maamon Ameen Hezam, et al,

Mean $\pm$ SD of duration for achieving Hemostasis in group A (Diathermy) was found to be

10.62 $\pm$ 1.76

Mean $\pm$ SD of duration for achieving Hemostasis in group B (Suture ligation) was found to be

14.32 $\pm$ 2.81

Sample size is calculated using the formula,

$n = 2(Z\alpha + Z1-\beta)^2 \sigma^2 / d^2$

Sample size estimated is 28 = 30 in each group

30 in Diathermy group and 30 in Suture ligation group.

Study design: Randomized controlled study

Single blinded.

RESULTS

60 patients who met the inclusion criteria were randomized into 2 groups using simple computer-generated randomization into-

Group A: 30 Patient will undergo Bipolar Diathermy for hemostasis,

Group B: 30 Patient will undergo Ligation for hemostasis,

Pre-operative assessment of patient was done with history and clinical examination including paradise criteria, Xray Nasopharynx and diagnostic nasal endoscopy.

Tonsillectomy done by dissection and snare method under GA, Bleeding during surgery calculated by total amount of fluid collected in the suction Jar after excluding the NS used and the difference between the weight of pre and post operative gauze pieces and cotton ball. (1gm approximately taken equal to 1ml), Post operatively, assessment of tonsillar fossa for presence or absence of bleeding, clots, slough, on post of day 2, 4 and 10 was done.

Table 1- Majority Of The Patients Were In The Age Group Of 10-20 Years I.e., 34 (56%) Patients, In Group A 16 Patients And In Group B 18 Patients, Followed By Age Group Of <10 Years With 12 (20%) Patients.

Age	Group-A	Group-B	Total	P value
<10	6(20%)	6(20%)	12 (20%)	0.566, Not Sig
11-20	16(53.3%)	18(60%)	34 (56%)	
21-30	4(13.3%)	5(16.7%)	9 (15%)	
31-35	4(13.3%)	1(3.3%)	5(8.33%)	
Total	30(100%)	30(100%)	60 (100%)	

Table 2-mean duration of procedure is 59 minutes in group A and 55 minutes in group B.**Duration of surgery was considered from the time of intubation to extubation.**

Parameter	Group-A		Group-B		P value
	Mean	Sd	Mean	Sd	
DOP	59.00	15.17	55.00	17.47	0.348

Table 3- mean volume of blood loss was 78.16 ml in group A and 82.04 ml in group B.

Parameter	Group-A		Group-B		P value
	Mean	Sd	Mean	Sd	
BL	78.16	15.44	82.04	24.89	0.47

Table 4- primary hemorrhage i.e during the procedure was noted in all patients.

Primary Haemorrhage	Group-A	Group-B
Present	30 (100%)	30 (100%)
Absent	0	0
Total	30 (100%)	30 (100%)

Table 5- none of the patients had secondary hemorrhage.

POST OP		Group-A	Group-B
Secondary haemorrhage	Present	0	0
	Absent	30 (100%)	30 (100%)
Total		30 (100%)	30 (100%)

DISCUSSION

Multiple studies have compared bipolar diathermy and ligation for haemostasis in tonsillectomy, with most showing minimal differences in postoperative haemorrhage rates. Papangelou⁷ (1972), Goycoolea et al.⁸ (1982), Roy et al.⁹ (1976), and Malik et al.⁵ (1982) all reported no significant difference in bleeding, though bipolar diathermy often reduced operative time. Some, like Roy et al.⁹, noted increased postoperative pain with diathermy. Robert et al.⁶ (1982) and Watson et al.⁷ (1993) found slightly different haemorrhage profiles between techniques, but differences were statistically insignificant.

More recent studies (e.g., K. Sharma et al.⁸, Choy et al.⁹, Khan et al.¹⁰, Hazem et al.) consistently report that bipolar diathermy leads to reduced blood loss and operative time, though findings on postoperative pain remain mixed. A.R. Khan et al.¹⁰, and Salam et al.¹¹ noted more pain in adults undergoing diathermy. Some studies (e.g., Anand et al.¹⁵, Anwar et al.¹⁶) raised concerns about technique failure or slightly higher haemorrhage with diathermy, though often without statistical significance.

Overall, while bipolar diathermy may offer advantages in operative efficiency and blood loss, both techniques appear equally safe regarding postoperative haemorrhage, with pain outcomes varying by patient population and study.

CONCLUSIONS

In this randomized controlled trial of 60 tonsillectomy patients, we found no statistically significant differences between ligation and bipolar diathermy in terms of blood loss, operative time, or postoperative hemorrhage. However, bipolar diathermy showed a trend toward reduced blood loss, shorter operative time, and better clinical outcomes. It can be considered a safe and efficient method for achieving hemostasis during tonsillectomy.

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