

## ORIGINAL ARTICLE

# Compare Bipolar Diathermy and Suture Ligation for Hemostasis in Tonsillectomy in Terms of the Amount of Blood Loss

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## ABSTRACT

**Objective:** The purpose of our study is to compare the outcomes in terms of blood loss, post-operative hemorrhage and operative time between bipolar diathermy and suture ligation for hemostasis in tonsillectomy.

**Study Design:** Randomized Control trial

**Place and Duration:** The study was conducted at ENT department of Peshawar Medical College Peshawar and Chaudhary Muhammad Akram Teaching and Research Hospital Lahore during the period from February 2020 to July 2020.

**Methods:** There were ninety four patients of both genders with ages 5-40 years were presented. Included patients had chronic tonsillitis. After obtaining informed permission, the recruited patients' demographic data, including their age and gender, was recorded. Patients were equally categorized in two groups. Group I had 47 patients and received bipolar diathermy and group II received suture ligation among 47 cases. Outcomes among both groups were calculated and compared in terms of operative time, blood loss and post-operative complications. SPSS 25.0 version was used to analyze complete data.

**Results:** Majority of the patients were males 55 (58.5%) and the rest were females 39 (41.5%) in study. In patients of bipolar diathermy mean age were 14.11±4.55 years while in group II mean age was 13.32±6.49 years. Number of left side tonsils in group I was among 25 (53.2%) patients and in group II left tonsils found in 30 (63.8%) cases. Mean operative time in group I was lower 11.9±8.88 minutes as compared to group II 15.4±4.35 minutes with p value <0.03. Mean blood loss in group II was significantly higher 40.15±7.71 mL as compared to group I 25.4±6.42 mL with p value <0.04. There was no any case found of post-operative hemorrhage in both groups. Frequency of ligatures among group I was 2 (4.3%) significantly lower than group II in 45 (95.7%) cases.

**Conclusion:** We concluded in this study that the use of bipolar diathermy for hemostasis in tonsillectomy was beneficial and efficient in terms of less operative time with less blood loss as compared to suture ligation technique. Except this both technique are beneficial in term of post-operative hemorrhage which was not observed in both groups.

**Keywords:** Bipolar Diathermy, Hemostasis Tonsillectomy, Suture Ligation, Hemorrhage, Blood Loss

## INTRODUCTION

Tonsillectomy is one of the most often performed surgical operations [1]. Because it's an optional operation, there's usually a higher-than-average bleed rate. In addition, bleeding in this area (the upper airways) is always a concern. It's for this reason that tonsillectomy procedures and primary haemostasis have been and continue to be the subject of much debate [2–3].

Our current understanding of the tonsils suggests that they should be preserved as possible immunological assets at least in their early years, unless their size is making breathing, Eustachian tube function, speech, or feeding extremely difficult or they have become the site of a disease. This is generally agreed upon in our current knowledge. It is advisable to remove these tumours, especially if the afflicted tonsils become a nidus for infections or their blood supply is so limited that any medical treatment administered may be useless [4].

Tonsillectomy procedures are experiencing a significant change at the moment. In the past, hemostasis with or without ties was used for dissection tonsillectomy, but new dissection methods have sprung up to help

patients with the discomfort and bleeding that follow the treatment. Newer procedures include intracapsular tonsillectomy with debrider, harmonic scalpel (ultrasound) tonsillectomy, plasma mediated ablation technique, cryosurgical technique, electrocautery, laser tonsillectomy, coblation tonsillectomy, and radiofrequency, however all are currently under investigation.

If a patient suffers from frequent bouts of incapacitating tonsillitis that result in substantial time away from school or work, a tonsillectomy may be necessary. Repeated bouts of real acute tonsillitis (3–4 per year for 2–3 years) are a solid sign of adult tonsillectomy.[5,6]

Otolaryngology's most frequent surgical treatment is the removal of the tonsils, which has long been considered a significant surgery due of its postoperative haemorrhage and anaesthesia difficulties [7]. An 18 percent rate of intraoperative haemorrhage with more than 10% of the patient's blood volume is documented, whereas postoperative haemorrhage occurs in 0 to 10% of cases. Between 1 in 1100 and 1 in 16000 people have died as a result of the disease [8]. It's easy to categorise haemorrhage into two types: perioperative and

postoperative, the latter of which may be further broken down into reactive and secondary haemorrhage. In many cases, tonsillectomy-related deaths may be traced back to this condition.

Tonsillectomies have been performed using a range of hemostatic medications and sophisticated surgical procedures in an effort to minimise postoperative bleeding. Hemostasis has always relied on ligating blood vessels/bleeding sites [9]. Astringents such as silver nitrate, tannic acid, and diluted adrenaline solution have been recommended for postoperative bleeding management [10]. Epsilon amino caproic acid (an antifibrinolytic drug) administered intravenously reduces surgical blood loss significantly [11,12].

There is still debate concerning the usefulness of bipolar diathermy in reducing postoperative bleeding (secondary haemorrhage), which is why this research is being conducted to clear up any confusion. A higher incidence (13.33 percent) of subsequent bleeding after surgery when using bipolar diathermy for hemostasis than when using suture ligation for hemostasis (a rate of 4.15 percent). This finding comes from a Pakistani research. [22,13] However, worldwide research shows that there is no substantial difference in postoperative bleeding between the two methods[14,15]. As a result, this research will aid in testing the safety and efficacy of bipolar diathermy for haemostasis during tonsillectomy, and if it is shown to be safe and successful, it will minimize surgery and anaesthetic time, operating time utilizing sutures, and be cost-effective.

**MATERIAL AND METHODS**

This randomized control trial was conducted at ENT department of Peshawar Medical College Peshawar and Chaudhary Muhammad Akram Teaching and Research Hospital Lahore during the period from February 2020 to July 2020. The study was comprised of 94 cases that had chronic tonsillitis. After obtaining informed permission, the recruited patients' demographic data, including their age and gender, was recorded. In this research, individuals who had anemia, acute infection, suspected of malignancy, and those using anticoagulants were excluded.

Included patients were aged between 5-40 years. Occurring tonsil problems might create trouble in the patient's ability to breathe, swallow, and fall asleep. Patients were equally categorized in two groups. Group I had 47 patients and received bipolar diathermy and group II received suture ligation among 47 cases. Pressure hemostasis balls containing simple moistened cotton and gauze were weighed before and after surgery. A sample of the suction bottle's blood was also analysed. Using a weight-to-volume conversion (1 gramme = 1 millilitre) and adding the resulting total to the volume of blood collected in each of the suction bottles, we calculated the amount of blood lost from each fossa.

Outcomes among both groups were calculated and compared in terms of operative time, blood loss and post-operative complications. SPSS 25.0 version was used to analyze complete data. In order to be declared statistically significant, a p-value of 0.05 or less was required. The frequency and incidence rate of postoperative main and secondary bleeding were evaluated using a Chi-square

test. A pvalue less than or equal to 0.05 was deemed significant.

**RESULTS**

Majority of the patients were males 55 (58.5%) and the rest were females 39 (41.5%) in study.(fig 1)

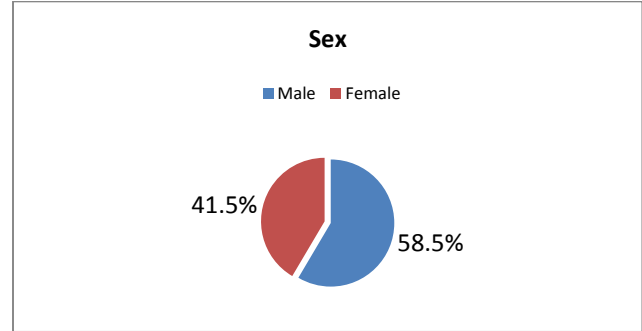


Figure 1: Gender distribution of enrolled cases

In patients of bipolar diathermy mean age were 14.11±4.55 years while in group II mean age was 13.32±6.49 years. Number of left side tonsils in group I was among 25 (53.2%) patients and in group II left tonsils found in 30 (63.8%) cases (table 1)

Table 1: Characteristics details of enrolled cases

Variables	Bipolar Diathermy	Suture Ligation
Mean age (years)	14.11±4.55	13.32±6.49
Side of Tonsils		
Left	25 (53.2%)	30 (63.8%)
Right	22 (46.8%)	17 (36.2%)

Mean operative time in group I was lower 11.9±8.88 minutes as compared to group II 15.4±4.35 minutes with p value <0.03. Mean blood loss in group II was significantly higher 40.15±7.71 mL as compared to group I 25.4±6.42 mL with p value <0.04. There was no any case found of post-operative hemorrhage in both groups.(table 2)

Table 2: Comparison of outcomes among both groups

Variables	Bipolar Diathermy	Suture Ligation	P value
Mean operative time (minutes)	11.9±8.88	15.4±4.35	<0.03
Mean blood loss (ml)	25.4±6.42	40.15±7.71	<0.04

Frequency of ligatures among group I was 2 (4.3%) significantly lower than group II in 45 (95.7%) cases.(table 3)

Table 3: Comparison of ligatures among both groups

Variables	Bipolar Diathermy	Suture Ligation
Ligatures		
Yes	2 (4.3%)	45 (95.7%)
No	45 (95.7%)	2 (4.3%)
Frequency of Ligatures		
One	1 (2.1%)	4 (8.5%)
Two	1 (2.1%)	34 (72.3%)
Three	0	7 (14.9%)

## DISCUSSION

Tonsil surgery has come a long way in recent years. Preoperative blood loss, infection and haemorrhage after tonsillectomy are all considerations to consider, as are operating time, the surgeon's expertise and preference, the degree of postoperative discomfort and when the patient may return to regular activities. Reducing these values is expected to have positive effects on patient recovery and well-being, as well as clear ramifications for society and the economy. The number of tonsillectomy procedures has increased in recent years in an effort to reduce the risks and consequences of the procedure. Each approach has its own set of advantages and drawbacks. [16]

Current study had 94 patients. Majority of the patients were males 55 (58.5%) and the rest were females 39 (41.5%) in study. These findings were comparable to the studies conducted in past.[17] Khan AR et al observed a high rate of tonsillectomy in men (72.22 percent) and related this to the potential of male dominance in society.[18] In our study, patients of bipolar diathermy mean age were 14.11±4.55 years while in group II mean age was 13.32±6.49 years. Our research found that the majority of tonsillectomies occurred in the same age range as sheikh s et al, however her data about gender distribution revealed that females had a greater prevalence than men (57.5%).[19] Number of left side tonsils in group I was among 25 (53.2%) patients and in group II left tonsils found in 30 (63.8%) cases.[20]

In this study we found that mean operative time in group I was lower 11.9±8.88 minutes as compared to group II 15.4±4.35 minutes with p value <0.03. Mean blood loss in group II was significantly higher 40.15±7.71 mL as compared to group I 25.4±6.42 mL with p value <0.04. There was no any case found of post-operative hemorrhage in both groups. Bipolar diathermy required a shorter average operative time (20 minutes) than silk ligation (30 minutes), and the incidence of primary bleeding was higher with silk ligation, while secondary haemorrhage was significantly lower with silk ligation, according to a previous prospective comparative study involving 250 patients.[21] According to Karan Sharma et al, a research comparing bipolar diathermy versus suture ligation found that it greatly shortened the length of the surgery and the quantity of blood loss. Bipolar diathermy had a lower rate of postoperative bleeding than suture ligation, but the postoperative discomfort was similar. [22] According to another research by choy et al, controlling bleeding using bipolar diathermy is faster, simpler, and less painful than traditional methods. When compared to suture ligation, there was no additional post-operative discomfort. [23]

In a research by Watson et al, no change was identified in the intensity or frequency of postoperative bleeding, despite a considerable reduction in surgical time. [24] The outcomes of some of the research are shown in the following paragraphs. There have been a number of studies on this topic, focusing on the safety and speed of the procedure, but the findings have been mixed. For hemostasis, the bipolar diathermy approach takes 15 minutes compared to 30 minutes with silk ligation, according to a published research of 180 patients. Silk ligation reduces subsequent bleeding while maintaining the same risk of original haemorrhage. [25]

In a clinical investigation, Kousha et al. [26] found that bipolar diathermy tonsillectomy resulted in much less intraoperative blood loss and shorter operational time than cold steel dissection with ties. Another prospective investigation found that the bipolar diathermy approach considerably reduced operating time and intraoperative blood loss compared to the cold steel dissection and ties procedure.[27] Frequency of ligatures among group I was 2 (4.3%) significantly lower than group II in 45 (95.7%) cases.[17-20] Based on this research, bipolar diathermy for hemostasis in tonsillectomy is a safer, more effective, simpler, and quicker procedure than ligation technique in terms of blood loss, hemostasis, operational and anaesthetic time, and needs a less number of ligatures.

## CONCLUSION

We concluded in this study that the use of bipolar diathermy for hemostasis in tonsillectomy was beneficial and efficient in terms of less operative time with less blood loss as compared to suture ligation technique. Except this both technique are beneficial in term of post-operative hemorrhage which was not observed in both groups.

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