ORIGINAL ARTICLE

# COMPARISON BETWEEN SILK LIGATION AND BIPOLAR CAUTERY IN TONSILLECTOMY

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## ABSTRACT

**Background:** Tonsillectomy is a commonly performed surgical procedure. There are several operative methods but the superiority of one over the other has not been clearly demonstrated. The aim of this study was to compare the morbidity associated with tonsillectomy using two different techniques for hemostasis – silk ligation versus diathermy.

**Material and Methods:** This was an experimental study conducted at ENT Department of Khyber Teaching Hospital Peshawar and Gomal Medical College D.I.Khan, from January 2003 to December 2004. Results of the two groups i.e. tonsillectomy using silk ligation or diathermy for hemostasis were studied.

**Results:** Tonsillectomy of 180 patients was performed; 130 (72.22%) male and 50 (27.77%) female. Bipolar diathermy was used in 60 cases to achieve hemostasis while silk ligation in 120. The mean operation time was 15 minutes with bipolar diathermy as compared to 30 minutes with silk ligation. Analgesia requirement in first 24 hours was equal in both groups.

Primary hemorrhage was noticed in 4 (6.66%) cases when hemostasis was achieved using bipolar diathermy and in 8 (6.66%) cases when silk was used. Secondary hemorrhage was noticed in 8 (13.33%) cases with bipolar diathermy as compared to only 5 (4.16%) when silk ligation was done.

**Conclusion:** Less operative time is taken by bipolar diathermy method as compared to the tonsillectomy using silk ligation for hemostasis. Chances of primary hemorrhage are equal but secondary hemorrhage is significantly less with silk ligation.

**Key words:** Tonsillectomy, Dissection method, Diathermy, Postoperative bleeding.

## INTRODUCTION

Tonsillectomy is one of the most commonly performed operations in pediatric population all over the world. Celsus and Paul of Aegine described tonsillectomy in the literature in 1000 BC.[1,2] The Greeks called the tonsils indurated and inflamed antiades. They were loosened by scraping around them and then torn out; alternatively they were picked up with little hook and excised with a scalpel. Afterwards the fossae were washed out with vinegar and painted with a medication to reduce bleeding.[3] The operation becomes popular in the nineteenth century after the invention of "tonsillotome" by Physick.[4] Different techniques and instruments have been used for removal of tonsil along with haemostasis but none of them were found satisfactory. Until now present tonsillectomy with Guillotine is in practice at some centers of Europe and UK.[5] Modern methodologies like, use of harmonic scalpel, bipolar scissor dissection, radio frequency excision with probes, microdebrider endoscopic tonsillectomy, laser tonsillectomy and the bipolar radio frequency ablation techniques has revolutionized the surgery of tonsillectomy.[6] These new ways are considered to reduce the size of the tonsil, to decrease the time period, to minimize and prompt control of bleeding during surgery and to decline postoperative pain enabling the patient to resume his or her normal day-to-day activities.[7]

There is no single method of tonsillectomy. Blunt, laser or diathermy dissection can accomplish dissection tonsillectomy.[8] Laser tonsillectomy has achieved a growing popularity in the United States with the increasing availability of machines and reported reduction in morbidity.[9] Tonsillectomy is regarded as the most common surgery performed in otolaryngology. Its indications has remained controversial since its inception.[10] American academy of otolaryngology-head and neck surgery (AAO-HNS) recommends that children who have three or more tonsillar infections a year to undergo tonsillectomy, while the young adult patient with a sleep disorder should be a candidate for removal or reduction of enlarged tonsils.[11] Today the dissection method is still preferred for the

removal of enlarged or recurrent infected tonsils in spite of various modern methods and surgical instruments.[12] It is important to find the proper plane of dissection to avoid excessive bleeding. With the advent of different technologies which reduce the size of enlarged tonsils along with the effective haemostasis like electro-cautery tonsillectomy, micodebrider endoscopic tonsillectomy, tonsillectomy by harmonic scalpel, laser tonsillectomy and coblation tonsillectomy. Today the modern methods for tonsillectomy has turned this operation as an outpatient procedure in many centers at UK and USA but still the debate is going on for control of haemorrhage.[13]

In spite of all the new surgical tools and techniques haemorrhage is still a significant complication during and after tonsillectomy and about 5% patients may face this problem at any time from first 24 hours to 10 days after operation.[14] Haemorrhage due to tonsillectomy has been classified according to the time i.e. primary occurring within 24 hours and secondary after 24 hours of surgery. The term reactionary haemorrhage is also used for intra-operative and primary haemorrhage.[17,18]

Electro-cautery and suture ligation are the two common means for controlling haemorrhage during and after tonsillectomy with variable results.

Use of bipolar diathermy although decrease the time to control the bleeding but there is always a danger of necrosis and infected slough formation which may lead to secondary haemorrhage.[21, 22]

Secondary haemorrhage in ligation is due to loosening of knot and ligature while straining during coughing or vomiting.

The aim of this study was to compare the morbidity associated with tonsillectomy using two different methods of haemostasis during surgery i.e. ligation versus diathermy.

## PATIENTS AND METHODS

This experimental study was conducted in the ENT Department of Khyber Teaching Hospital Peshawar and Gomal Medical College D.I.Khan, from January 2003 to December 2004. Method of selection was by convenient sampling. Tonsillectomy in all cases was performed according to the criteria approved by the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS). Inclusion criterion was chronic or recurrent tonsillitis, too big tonsils with blockage of throat, white debris on the tonsils, peri-tonsillar abscess, sleep apnea and unusual enlargement of tonsils. While the exclusion criteria were acute tonsillitis, metastatic malignancies, Eagles syndrome, co-existing upper or lower respiratory infection and contraindications to anesthesia.

Patients with bleeding diathesis, poor anesthetic risk, uncontrolled medical illness, anemia and acute infection were excluded from the surgery. Investigations performed were complete blood count, bleeding and clotting time, prothrombin time, platelets count, urinalysis, chest x-ray and ECG.

Tonsillectomy was performed under general anesthesia, by dissection method leaving behind the capsule intact. In some cases bipolar diathermy was performed to control the bleeding during operation and in others silk was used for ligation of the bleeding points. All the cases were kept for observation in the recovery phase for any immediate post operative haemorrhage. The cases were shifted to the ward after complete recovery from anesthesia. Monitoring of the vital sign; pulse, blood pressure and respiration during the next 24 hours was mandatory for all the cases.

## RESULTS

A total of 180 cases were selected for the tonsillectomy; 130 (72.22%) male and 50 (27.77%) female, indicating slightly higher incidence in the male population or increased preponderance for treatment in the males. (Table-1)

The distribution of patients among different age group was, 100 cases belonging to 5 to 15 years, 50 cases 16 to 30 years and 30 cases were 31 years or above.

In this study 120 (66.66%) cases were having recurrent episodes of tonsillitis for the last 2 to 3 years, 30 (16.66%) cases were having bilateral enlarged tonsils causing respiratory obstruction and dysphagia, in 15 (8.33%) cases there was persistent cervical lymphadenopathy not responding to medical treatment with tonsillitis as the cause, in 8 (4.44%) cases there was past history of quinsy and there were 7 (3.88%) cases with unilateral enlargement of the tonsil. (Table-2)

We used bipolar diathermy in 60 cases to achieve haemostasis during the surgery while in 120 cases silk was used for the same purpose.

**Table-1: Gender distribution of patients for tonsillectomy.** (n=180)

| S. No | Sex | Number of patients | Percentage |
|---|---|---|---|
| 1. | Male | 130 | 72.22 |
| 2. | Female | 50 | 27.77 |

**Table-2: Indications for tonsillectomy in our series.** (n = 180)

| S. No. | Disease | No. of patients | Percentage of patients |
|---|---|---|---|
| 1 | Recurrent tonsillitis | 120 | 66.66 |
| 2 | Bilateral enlarged tonsils | 30 | 16.66 |
| 3 | Cervical lymphadenopathy | 15 | 08.33 |
| 4 | Post quinsy | 8 | 04.44 |
| 5 | Unilateral enlarged tonsils | 7 | 03.88 |

The operation time was 15 minutes with bipolar diathermy as compared to 30 minutes on average for tonsillectomy by dissection snare method.

Analgesics required in the first 24 hours were almost equal in both the groups with no significant difference.

Assessment of haemorrhage was made according to the time and intensity of blood loss. Primary haemorrhage was noticed in 4 (6.66%) cases when haemostasis was achieved using bipolar diathermy and in 8 (6.66%) cases when silk was used to control the bleeding during operation. (Table-3) In either case suture or ligation under anesthesia was not required.

Secondary hemorrhage was noticed in 8 (13.33%) cases when bipolar diathermy was used as compared to only 5 (4.16%) when silk ligation was done. It was on the second postoperative day, controlled by ligating the bleeding point under general anesthesia.

## DISCUSSION

In our study a total of 180 cases were selected for tonsillectomy; 72.22% males and 27.77% females, indicating a higher incidence in the male population. It may be due to increased preponderance for treatment in our male dominating society.

The operation time was 15 minutes with bipolar diathermy as compared to 30 minutes on average for tonsillectomy by dissection snare method. Lassalelta et al studied 120 cases and found little difference in the two methods, with average of 15.3 minutes with bipolar and 16.3 minutes with dissection snare method.[15]

In our study the analgesics required in the first 24 hours were almost equal in both the groups with no significant difference. This is similar to other studies comparing electro-dissection to the conventional technique.[16]

Primary haemorrhage was noticed in our study in 2.2% cases where haemostasis was achieved using bipolar diathermy and in 4.4% cases when silk was used to control the bleeding during operation. Szeremeta et al (1996) in a retrospective study of 494 patients found postoperative bleeding in 2.8% of patients who underwent electro-cautery tonsillectomy as compared to 7.6% of patients with dissection snare tonsillectomy. Mackenzie et al reported 172 patients who had ligatures on one side compared to diathermy on the other side; only one primary bleed occurred on the ligated side.[19, 20]

## CONCLUSION

There is significantly less operative time taken by bipolar diathermy method as compared to the tonsillectomy using silk ligation for hemostasis. Chances of primary hemorrhage are equal but secondary hemorrhage is significantly less with silk ligation.

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**Table-3: Post operative haemorrhage.** (n=180)

| S. No. | Method of Hemostasis | Average Time of Surgery (Minutes) | Primary Hemorrhage | Secondary Hemorrhage |
|---|---|---|---|---|
| 1. | Bipolar diathermy | 15 | 4 /60 (6.66%) | 8/60 (13.33%) |
| 2. | Silk ligation | 30 | 8/120 (6.66%) | 5/120 (4.16%) |

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