

**24 A STUDY OF COMPARISON BETWEEN SILK LIGATION AND BIPOLAR CAUTERY IN TONSILLECTOMY** authors DR. NEHAL R. PATEL\*, DR. ALPESH V. PATEL\*\*,

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ABSTRACT

**Background:** Tonsillectomy is one of the most commonly performed surgical procedure. Different techniques and instruments have been used for removal of tonsils along with haemostasis but none of them were found satisfactory. The aim of this study is to assess and compare the relative efficacy of silk ligation and bipolar cautery coagulation techniques in controlling bleeding during tonsillectomy.

**Materials and Methods :** This prospective study was conducted at the department of ENT, M.P.Shah Government Medical College, Jamnagar. The study included 70 cases. All patients included were having history of recurrent, chronic tonsillitis, with more than 6-7 episodes in one year, 5 episodes in year for 2 years, or 3 episodes per year for three years. All surgeries were performed by conventional (dissection) method leaving behind the capsule intact. Results of the two groups i.e. tonsillectomy using silk ligation or bipolar cautery for haemostasis was studied.

**Results:** Tonsillectomy of 70 patients was performed; 39(55.71%) male and 31(44.29%) female. Bipolar cautery was used in 35 patients to achieve haemostasis while silk ligation in 35. The age of ranged from 3 to 30 years and above with the mean age of 23.33 years. Analgesia requirement in first 24 hours were equal in both groups.

Incidence of primary haemorrhage was noticed in 6(17.14%) cases when haemostasis was achieved with use of silk ligation and in 2(5.71%) cases when bipolar cautery used( due to loosening of knot and rise of blood pressure after the effect of anaesthesia wears off and due to post-operative reactionary oedema). Incidence of secondary haemorrhage was nil after tonsillectomy with use of

both bipolar cautery and silk ligation. In our study, bipolar cautery was better than silk ligation in post-operative haemorrhage.

**Conclusion:** chances of secondary haemorrhage were equal but primary haemorrhage was significantly less in bipolar cautery.

## INTRODUCTION

Tonsillectomy is one of the most commonly performed surgical procedures particularly in paediatric age group with varying popularity over the world. Celsus and Paulus Aegineta described tonsillectomy in literature in 1000BC<sup>1,2</sup>. Aulus Cornelius Celsus(25-50AD) described a procedure whereby using the finger to separate the tonsils from the neighbouring tissue before they were cut out. Galen (121-200AD) was the first to advocate the use of surgical instrument known as the snare. In the 7<sup>th</sup> century Paulus Aegineta(625-690AD) described a detailed procedure for tonsillectomy, including dealing with the inevitable post-operative bleeding. 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. After that the fossae were washed out with vinegar and painted with a medication to reduce bleeding<sup>3</sup>. Scottish physician Peter Lower in 1600 AD introduced the cold steel technique including the snare, the ligature and the excision. The operations become popular in nineteenth century after the invention of "tonsillotome" by Guillotine<sup>4</sup>. Different techniques and instruments have been used for removal of tonsils along with haemostasis but none of them were found satisfactory. Modern methodologies like, use of harmonic scalpel, bipolar scissor dissection, microdebrider endoscopic tonsillectomy and laser tonsillectomy techniques has revolutionized the surgery of tonsillectomy<sup>5</sup>. These new ways are considered to reduce the size of the tonsils, to decrease the time period, to minimise and prompt control of bleeding during surgery and to decrease post-operative pain and to resume his or her normal day-to-day activities<sup>6</sup>. American Academy of Otolaryngology-Head and Neck Surgery(AAO-HNS) recommends that children who have three or more tonsillar infections a year that result in significant loss of school or work and some associated with chronic suppurative otitis media and cervical lymphadenopathy while the young adult patients with repeated attacks(3-4 per year for 2-3year)of acute tonsillitis or a sleep disorder should be a candidate for removal of enlarged tonsils<sup>7</sup>. 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 and is usually safe and simple<sup>8</sup>. It is important to find the proper plane of dissection to avoid excessive bleeding. It has been regarded as a major surgery because of its known post-operative haemorrhage and complications due to anaesthesia. With the advent of different technologies like electro-cautery tonsillectomy, microdebrider endoscopic tonsillectomy, tonsillectomy by harmonic scalpel, laser tonsillectomy and coblation tonsillectomy, it has been possible to reduce the size of tonsil and effective haemostasis. However, their cost and availability limit their use. In spite of all 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<sup>10</sup>. Primary haemorrhage occurring <24 hours after tonsillectomy remains the most serious complication of surgery. Today the modern methods for tonsillectomy has turned this operation as an outpatient procedure in many centers at UK and USA but still debate is going on for control of haemorrhage<sup>9</sup>. Haemorrhage due to tonsillectomy has been classified according to the time i.e. primary

haemorrhage which occurs during the first 24 hours of surgery and secondary haemorrhage occurs after 24 hours of surgery<sup>13,14</sup>.

Bipolar cautery and silk ligation are the two common means for controlling haemorrhage during and after tonsillectomy with variable results.

With use of bipolar cautery the area of tissue ligation is localized between the fine tips of cautery forceps causing less tissue necrosis in a more controlled and precise fashion resulting in less post-operative bleeding but there is always a danger of necrosis and infected slough formation which may lead to secondary haemorrhage<sup>17,18</sup>. Secondary haemorrhage in silk ligation due to loosening of knot and ligation while straining during coughing or vomiting and post-operative oedema.

The aim of this study was to compare the morbidity and determine the efficacy of bleeding control during tonsillectomy using two different methods of haemostasis during surgery i.e. silk ligation versus bipolar cautery.

## **MATERIALS AND METHODS**

It was a prospective and comparative study conducted in ENT Department of M.P.Shah Medical College, Jamnagar between July 2011 –September 2013, where 70 patients gathered from the out patient department.

Tonsillectomies in all cases were performed according to the criteria approved by the American Academy of Otolaryngology-Head and Neck Surgery(AAO-HNS).

**Inclusion criterions:** chronic and recurrent tonsillitis, too big tonsils with blockage of throat, peritonsillar abscess, sleep apnoea and unusual enlargement of tonsils between age group of 3 to 30 years and more.

**Exclusion criterions:** with bleeding tendency, recent episode of acute tonsillitis, metastatic malignancies, eagles syndrome, co-existing upper or lower respiratory tract infection, contraindications to anaesthesia, uncontrolled medical illness, anaemia and patients underwent adenotonsillectomy.

Informed consent was taken in all cases regarding the surgical procedure and inclusion in the study. A detailed history was taken. All the patients were admitted to the ward and investigated to determine their fitness for general anaesthesia and surgery. Clinical examination, socio-economical class evaluation and laboratory investigation like complete blood picture, bleeding and clotting time, prothrombin time, platelets count, urine analysis, chest x-ray and ECG were done.

All operations were performed by the same surgeon under general anaesthesia using the dissection method leaving behind the capsule intact. Bleeding points were immediately clamped and ligated. The tonsillar fauces were packed with cotton taken from the measured pad. Once the tonsils were snared off, they were squeezed thoroughly into the gauze(which was again taken from the measured pad) and the tonsils discarded. Patients were assigned on alternate basis into two

categories with respect to mode of haemostasis; by bipolar cautery in 35 patients(50% of cases) and silk ligation in the other 35 patients(50%).Suture ligation was carried out with silk 1 and cautery with use of bipolar cautery on coagulation setting. Complete haemostasis was achieved in both the groups. All cases were kept for observation in the recovery room for any immediate post-operative bleeding. Vital signs were monitored every 15 minutes in the recovery room and half hourly for the first two hours and then two hourly for the first 8 hours in the ward. The patients were shifted to the ward after complete recovery from general anaesthesia. Any excessive bleeding from the corner of mouth, difficulty in breathing, nausea and vomiting noted and recorded on the chart. Monitoring of vital signs; pulse rate, blood pressure, respiratory rate during next 24 hours for all patients was done. Blood stained saliva in the absence of rapid collection of blood for first 12 hours was taken as normal. The frequency of haemorrhage in the first 24 hours was compared in the two groups.

## RESULTS

A total of 70 cases were selected for the tonsillectomy.

We used bipolar cautery in 35 cases and silk in 35 cases to achieve haemostasis during the surgery.

Intra-operative inj.dynapar was given to all patients .Analgesics required in the first 24 hours were almost equal in both the group with no significant difference.

Primary haemorrhage was noticed in 2(5.71%) cases when haemostasis was achieved using bipolar cautery and in 6(17.14%) cases when silk ligation was used to control the bleeding during tonsillectomy (Table-4).

Not a single case noted for secondary haemorrhage.

**Table-1:** GENDER DISTRIBUTION OF PATIENTS FOR TONSILLECTOMY (n=70)

Gender	No. Of patients	Percentage (%)
Male	39	55.71
Female	31	44.29

39(55.71%) male and 31(44.29%) female, indicating slightly higher incidence in the male population (Table-1).

**Table-2** AGE DISTRIBUTION OF PATIENTS IN OUR STUDY (n=70)

Age group( in years)	Total no of cases	Percentage (%)
3 to 10	13	18.57
11 to 20	42	60
Above 21	15	21.42

The distribution of patients among different age group was, 13 cases belonging to 5 to 10 years, 42 cases 11 to 20 years and 15 cases were 21 above(Table-2).

**Table-3** INDICATIONS OF TONSILLECTOMY IN OUR SERIES (n=70)

Sr no.	Disease	No of patients	Percentage of patients
1	Chronic tonsillitis	55	78.57
2	Chronic suppurative otitis media	9	12.85
3	Bilateral cervical lymphadenopathy	5	7.14
4	Obstructive sleep apnoea	1	1.42

In this study 55(78.57%) cases were having recurrent episodes of tonsillitis for last 2 to 3 years,9(12.85%) cases were associated with chronic suppurative otitis media, in 5(7.14%) cases were persistent cervical lymphadenopathy not responding to medical treatment with tonsillitis as the cause,1(1.42%) case was associated with obstructive sleep apnoea(Table-3).

**Table-4** POSTOPERATIVE HEMORRHAGE (n=70)

Sr no.	Method of haemostasis	Primary haemorrhage	Secondary haemorrhage
1	Bipolar cautery	2 (5.71%)	0(0%)
2	Silk ligation	6(17.14%)	0(0%)

Primary haemorrhage was noticed in 2(5.71%) cases when haemostasis was achieved using bipolar cautery and in 6(17.14%) cases when silk ligation was used to control the bleeding during tonsillectomy. Not a single case noted for secondary haemorrhage (Table-4).

## DISCUSSION

Post-tonsillectomy haemorrhage remains the most serious and even fatal complication of tonsillectomy. Haemostasis is usually secured by ligating the bleeders or coagulating them by cautery or by a combination of both of them. Primary haemorrhage is generally considered to be related to surgical technique whereas factors that influence wound healing contribute to secondary haemorrhage.

In our study a total of 70 cases were selected for tonsillectomy; 55.71% males and 44.29% females, indicating a higher incidence in the male population due to increased preponderance for treatment in our male dominating society.

In our study the analgesics required in the first 24 hours were almost equal in both groups with no significant difference. This is similar to other studies comparing electro-dissection to the conventional technique<sup>12</sup>.

Primary haemorrhage was noticed in our study in 5.71% cases where haemostasis was achieved using bipolar cautery and in 17.14%cases when silk ligation used to control the bleeding during operation. Adel Sahib AL study in a retrospective study found post-operative bleeding in 7.2% of patients who underwent bipolar cautery as compared to 5.8% of patients with silk ligation.

Secondary haemorrhage noticed in our study was 0.0% case. Adel Sahib AL study found secondary haemorrhages in 4.1% with silk ligation and 4.8% with used of bipolar cautery<sup>17</sup>.

## CONCLUSION

Primary haemorrhage occurring during tonsillectomy is a serious threat and control of bleeding during the procedure should therefore be meticulous. Chances of primary haemorrhage was less in bipolar cautery as compared to silk ligation. Chances secondary haemorrhage was nil in both methods. Our study has shown that bipolar cautery is a better method of haemorrhage control as compared to tying of silk ligatures.

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