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Original Research Article

Comparative study between conventional dissection method versus bipolar cautery as a method of tonsillectomy

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ABSTRACT

Background: Aim of the study was to compare the conventional dissection versus bipolar cautery as method of tonsillectomy.
Methods: This hospital based prospective study consists of total 50 patients with chronic tonsillitis who were 5-18 years of age. Each patient randomly underwent tonsillectomy using the conventional dissection on one side and bipolar cautery on the other side. The patients were followed up on 1st, 3rd, 7th, 14th and 30th post operative day. Statistical analysis was done using paired-t test.
Results: In this study maximum number of patients were found in the age group of 11-15 years. The study showed that males were affected more than the females. Duration of surgical technique was significantly more in Bipolar cautery method than that in conventional dissection method. Intra-operative blood loss was more in Conventional dissection method. Post-operative pain was assessed using VAS (Visual analogue scale) and was significantly more in Bipolar cautery method as compared to the dissection method. Slough formation was more in Bipolar cautery method than dissection method on Day 1st, 3rd, 7th, and similar on both sides on 14th post-operative day. There was no post-operative bleeding seen in any of the methods in this study.
Conclusions: Intra-operative blood loss was more in Conventional dissection method. Duration of surgery, post-operative pain and slough formation was more in Bipolar cautery method.

Keywords: Chronic tonsillitis, Tonsillectomy, Conventional dissection method, Bipolar cautery method

INTRODUCTION

Tonsillectomy is one of the commonly performed operations undertaken by otolaryngologists.[1] It was first described for the first time by Celsius in the first century AD.[2] It is a surgical procedure in which both Palatine tonsils are removed from the tonsillar fossa. It is usually performed for recurrent tonsillitis and tonsillar hypertrophy and usually done in children. There are several existing techniques to perform tonsillectomy including-cold dissection, cryosurgery, diathermy (monopolar and bipolar) dissection, coablation and laser surgery.[3] Cold dissection and electrocautery dissection are the main and most commonly used techniques for tonsillectomy.[4] Major post-op morbidity includes pain and haemorrhage.[5]

Aim of the study

To compare efficacy of conventional dissection method versus Bipolar cautery as method of tonsillectomy in terms of operative time, intra-operative bleed, post-operative haemorrhage, post-operative pain and slough formation.

METHODS

This is a hospital based prospective randomised control study carried out over a period of 18 months (January

2020 to August 2021) in department of ENT and HNS, Muzaffarnagar medical college and hospital. Necessary permission and approval from the ethics committee was taken prior to the study. Informed written consents were obtained from the patient's attendants involved in the study. A total of 50 patients of 5-18 years of age who were diagnosed with chronic tonsillitis based on history and clinical examination were identified as candidates for tonsillectomy were included in the study. The method employed to remove the tonsils on right and left side with Conventional dissection method and bipolar cautery respectively will vary alternatively in patients. Routine investigations including, complete blood count, bleeding time, clotting time and prothrombin time were done. All the procedures were performed under the general anaesthesia.

Inclusion criteria

Chronic tonsillitis patients between 5-18 years of age were included in the study.

Exclusion criteria

Children with chronic tonsillitis below 5 years of age, patients above 18 years of age, overt/ sub mucous cleft palate, bleeding disorders, suspected malignancy of tonsil, peritonsillar abscess and asymmetrically enlarged tonsils were excluded from the study.

RESULT

As per our study 50 patients underwent tonsillectomy by conventional dissection and bipolar cautery method on right and left side alternatively under general anaesthesia. All patients were followed regularly after surgery on 1st, 3rd, 7th, 14th and 30th post operative days to assess the post operative morbidity and efficacy of both conventional and bipolar methods.

Table 1: Age distribution among the patients, (n=50).

Age (years)	Number of patients	Patients (%)
5-10	9	18
11-15	37	74
>16	4	8

In this study the majority of patients were in the age group 11-15 years.

Males were affected more than females in this study.

The duration of surgery was more in bipolar cautery than conventional dissection method as shown in Table 1. The mean duration of surgery, for conventional tonsillectomy was 11 minutes and 26seconds and for bipolar cautery was 15 minutes and 9 seconds thus it took an average of 3 minutes 43 sec more to perform conventional dissection procedure compared to bipolar cautery and this difference is statistically significant, t=15.71 (p<0.00001).

Table 2: Gender wise distribution of patients.

Gender	Number of patients	Patients (%)
Male	30	60
Female	20	40
Total	50	100

Intra- operative blood loss was more in conventional dissection method than bipolar cautery as shown in Table 4.

The amount of intra operative blood loss on an average in conventional method was approximately 43 ml and in bipolar cautery was 22.14 ml. The difference was statistically significant (t value=15.717, p<0.00001).

Post-operative pain was assessed using VAS (Visual analogue scale) and was significantly more in bipolar cautery method as compared to the dissection method as shown in Table 3.

The mean pain score on day 1st, 3rd and 7th was more on bipolar cautery side as compared to dissection method. On day 1, t=13.5, p<0.00001, day 3, t=8.72, p<0.00001, day 7, t=4.62, p<0.00014, respectively and the results were statistically significant.

Slough formation was more in bipolar cautery method than dissection method on day 1st, 3rd, 7th, and similar on both sides on 14th post-operative day as shown in Table 4.

Table 3: Duration of surgery in min (n=50).

Surgery	Conventional dissection	Bipolar cautery	T value	P value
Duration (min)	11.26	15.9	15.71	<0.00001

Table 4: Comparison of intra operative blood loss in ml, (n=50).

Surgery	Conventional dissection	Bipolar cautery	T value	P value
Intra operative blood loss (ml)	43	22.14	16.20	<0.00001

Table 5: Comparison of post operative pain on 1st, 3nd and 7th post operative day.

Post-op day pain scale (VAS)	Conventional dissection	Bipolar cautery	T value	P value
1st day	2.56	2.74	13.55	<0.00001
3rd day	3.32	4	8.726	<0.00001
7th day	2.32	3	4.62	<0.00014

Table 6: Mean t and p value on 1st, 3rd, 7th and 14th day post operatively for slough formation, (n=50).

Post-op, slough formation	Conventional dissection	Bipolar cautery	T value	P value
1st day	2.56	2.74	1.927	0.02989
3rd day	3.3	4	10.204	0.00001
7th day	2.3	3	10.2	0.00001
14th day	1.32	1.34	0.216	0.4149

There was no post operative bleeding seen in any of the methods in this study.

DISCUSSION

Tonsillectomy is a very common surgery done worldwide by ENT surgeons. There are several existing techniques to perform tonsillectomy including- cold dissection, cryosurgery, diathermy (monopolar and bipolar) dissection, coablation and laser surgery.[3] Cold dissection and electrocautery dissection are the main and most commonly used techniques for tonsillectomy.[4]

Diathermy has the potential advantage over cold steel method of reduced perioperative bleeding. The major post-operative morbidity includes pain and haemorrhage.[5] Other complications include-post operative nausea and vomiting, delay to oral intake, airway obstruction with respiratory compromise, and primary or secondary and reactionary postoperative haemorrhage.

In this study duration of surgery was more in bipolar cautery than conventional dissection method. Study conducted by Leach et al also reported a decreased operative time with the cold dissection technique.

The intra-operative blood loss was more in conventional dissection method in this study. The blood vessels were cut during the dissection method while in bipolar cautery the cauterisation of the blood vessels while dissecting occurs simultaneously. Shanmugam et al noted a decrease intra operative blood loss in bipolar cautery side. Also, Ayden also reported that intra-operative bleed was less in diathermy method than dissection method.

A study done by Nunez et al found that hot dissection tonsillectomy halved the amount of blood loss.[6] Pang et al Raut et al showed 5 ml blood loss on an average for bipolar diathermy method while cold steel dissection technique had an average of 115 ml.[7,8] Mofatteh et al and Beriat et al found that intra-operative blood loss was significantly lower in the bipolar method.[9,10]

In this study post-operative pain was more in bipolar cautery method. Shanmugam et al, assessed post operative pain using VAS which showed that the pain was more in the bipolar cautery side from day 0 to day 5. However, there was not much difference in post operative pain on both sides on day 6, day 7 and day 14 This could be due to more local inflammation caused by the cautery than that caused by the cold dissection method. Similar post operative pain scores were reported by Helena Silveira and Ali, Rafique A in their study.

Khan et al, Beriat et al, Moonka, Mofatteh et al, Nunez et al and Gregor et al found that post-operative pain was more with bipolar diathermy method.[8-13]

The slough formation was more in bipolar cautery side as compared to dissection side on 1st, 3rd and 7th day of operation. Similar results were seen in the study conducted by Gupta R, Nath K.

Limitations

The intraoperative blood loss is more in conventional dissection method. The post operative pain is more in bipolar cautery method.

CONCLUSION

After observation and discussion of 50 cases we concluded that the clear field in tonsillar surgery which is very important is easily achieved by use of the bipolar cautery. The duration of surgical technique was significantly more in Bipolar cautery method than that in Conventional dissection method. Intra-operative blood loss was more in Conventional dissection method. The side on which cold dissection was done showed lower pain scores. The slough formation was also more in bipolar cautery method. No case of post operative bleeding was seen in any of the methods in this study.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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