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Comparison between dissection method and coblation technique in tonsillectomy

Shreyas S. Joshi*, Vinayak Raikar

Department of Otorhinolaryngology, Prakash Medical College, Islampur, India

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***Correspondence:**
Dr. Shreyas S. Joshi,
E-mail: joshienthospital@gmail.com

ABSTRACT

Background: The objective of the present study was to compare the dissection method and coblation technique in tonsillectomy in patients of chronic tonsillitis.
Methods: This is prospective study in which 40 patients of chronic tonsillitis in age group of 5-12 years were selected in this study. Patients were blinded with regards to technique used to remove tonsils. 20 patients underwent tonsillectomy by cold dissection method and 20 with coblation method. In both techniques, duration of surgery and amount of blood loss were recorded and compared.
Results: In our study, the mean operative time from giving incision to achieving complete haemostasis for dissection method was 42.9 minutes and that for coblation technique was 34 minutes. The amount of blood lost on an average by dissection method was 51.8 ml, and by coblation technique was 22.3 ml. This difference was found to be statistically significant. Pain was evaluated by visual analogue scale. The data recorded from two groups was put to statistical analysis and 'p' value was calculated using independent t-test. The mean pain score for coblation technique averaged over 10 days was 2.72 and was 4.84 for dissection technique.
Conclusions: We can conclude that coblation tonsillectomy is an easy to learn safe procedure with significant advantages in terms improving the quality of post-operative recovery compared to that following the cold dissection technique. But cost effectiveness of dissection method outweighs benefits of coblation at present in Indian scenario.

Keywords: Chronic tonsillitis, Tonsillectomy, Coblation tonsillectomy

INTRODUCTION

Tonsils are part of the Waldayer's ring, which is an aggregates of lymphoid tissue located in the nasopharynx and oropharynx at the entrance of the aero digestive tract.[1,2] It is important in children for its role in immunology and defence mechanism, antibody secretion, notably, in secretory Ig A production which plays an important part in mucosal defence mechanism. For unknown reason, their protective mechanism sometime fails and become seat of infection rendering recurrent sore throat, fever and other complications. This requires removal of the diseased tonsils i.e., tonsillectomy.[3]

Tonsillectomy is the commonly performed operation in Ear, Nose and Throat department. Various tonsillectomy techniques have been developed like dissection method, electrocautery, harmonic scalpel, ligasure Vessel sealing system, laser surgery, coblation surgery etc.[4-11] However, the dissection technique has remained the standard procedure for tonsillectomy for many years till now. But dissection method is associated with post-operative pain and risk of haemorrhage in the intraoperative and post-operative period. Various methods of tonsillectomy have been practiced over the century aimed at reducing or eliminating intraoperative and postoperative morbidity. Due to various blood supplies received, intraoperative

bleeding is the most difficult problem and securing it is time consuming. The time taken to control the bleeding would invariably determine the length of operation. Traditional procedures like electrocautery use high levels of heat to remove tonsils and adenoids by cutting or burning, which can cause extensive pain and damage to surrounding healthy tissue. Coblation tonsillectomy is a recently introduced surgical technique which is an advanced technology that combines gentle radiofrequency energy with a natural salt solution to quickly and safely remove tonsils and adenoids. Coblation does not remove the tonsils or adenoids by heating or burning, leaving the healthy tissue surrounding the tonsils unaffected.

This study was done to evaluate the difference between dissection method and coblation technique of tonsillectomy based on operative time taken, intraoperative blood loss, postoperative pain and other postoperative complications like primary or secondary haemorrhage.

METHODS

This study was conducted in department of otorhinolaryngology at Prakash Institute of Medical Sciences, Islmapur, over period of two years from July 2015 to June 2017. Total 40 cases of chronic tonsillitis were included in study after detailed evaluation.

Study design

Patients in age group of 5-12 years were selected in this study. In all 40 patients were included in this study. Informed consent was taken for the study and participated in the study voluntarily. Patients were blinded with regards to technique used to remove tonsils. 20 patients underwent tonsillectomy by cold dissection method and 20 with coblation method. In both techniques, duration of surgery and amount of blood loss were recorded and compared.

The surgery was conducted under general anesthesia with orotracheal intubation. In cold dissection, the method used was classical method using scissors and tonsillar dissector. No electrocautery was used to control the bleeding. If required, ligation of the bleeding vessel was done. In coblation tonsillectomy, haemostasis was achieved by the same wand in coagulation mode. Operating time was measured from the anterior pillar incision or beginning of dissection until complete haemostasis of tonsillar fossa was achieved. Before starting the surgery, a good amount of gauze and ribbon gauze was taken, weighed and sterilized. The weight was always kept constant at 20 g. The suction bottle including the rubber tube was cleaned and emptied completely before starting the operation. A known quantity of saline (150 ml) was taken in the bowl and used for intermittent suction, to prevent blockage of the suction tube.

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. Care was taken to see that the linen was not soiled with blood. All the packs and gauzes were kept on a physical balance for weighing.

After ligating the bleeders, the nostrils and nasopharynx were sucked. Then all the saline taken in the bowl was sucked into the suction bottle. The suction tube was raised above the level of the suction bottle to ensure that all the fluid was emptied into the suction bottle. The quantity was then measured by pouring it into the measuring cylinder.

Thus all the blood lost was collected either in the suction bottle or cotton and gauze. All the soiled gauzes and cotton balls together with unused cotton balls are placed on the physical balance and weighed. The difference in weights is the weight of blood lost in cotton and gauze. This was converted into millilitres by dividing the weight by specific gravity which is 1.055.

All children were prescribed a standard regimen of amoxicillin clavulanic acid injection, 90mg/kg body weight and suspension of paracetamol and ibuprofen at the interval of 8 hours. Following surgery, children were asked to provide a rating of their current pain intensity using a visual analogue scale (Figure 1) on 6, 12, 24 hours, 3rd day, 7th day, 10th day. Patients were discharged on the seventh postoperative day. Statistical analysis was done t tests were performed. Difference was considered significant when the p value is <0.05.

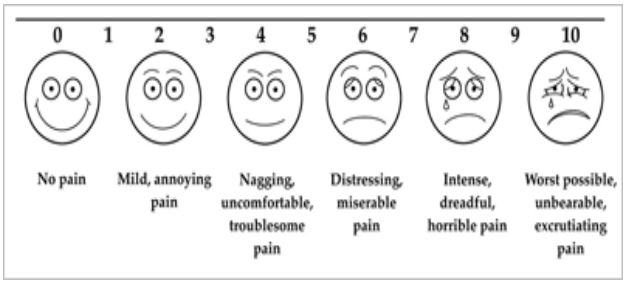

Figure 1: Visual analogue scale.

Ethical consideration

Institutional ethical committee approval was obtained before starting of the study. Confidentiality of study participants was maintained throughout the study.

RESULTS

Demographic distribution of data

There were 22 males and 18 females between ages 5 years to 11 years, averaging 7.8 years. The two groups were matched in terms of sex and age distribution.

Operative time

The mean operative time from giving incision to achieving complete haemostasis for dissection method was 42.9 minutes and that for coblation technique was 34 minutes. Thus it took an average of 9 minutes longer to perform for dissection method compared to coblation technique. This difference was statistically significant. Also, the operative time did not correlate with post-operative pain scores in either arm.

Intraoperative blood loss

The amount of blood lost on an average by dissection method was 51.8 ml, and by coblation technique was 22.3 ml. This difference was found to be statistically significant ($p<0.05$).

Table 1: Demographic distribution of data.

Age (in years)	Male	Female
5-8	12	9
9-11	10	9
Total	22	18

Table 2: Comparison of operative time and intra operative blood loss between dissection and coblation groups.

	Dissection method	Coblation method	P value
Mean operative time (min)	42.9	34	<0.05
Intra operative blood loss (ml)*	51.8±7.12	22.3±4.48	<0.05

*Mean±standard deviation

Table 3: Comparison of pain scores by VAS (out of 10) at successive evaluations between dissection and mean coblation methods.

Duration	Dissection method	Coblation method	P value
At 6 hours	8.65	5.35	<0.001
At 12 hours	7.85	4.3	<0.001
At 1 day	7.05	2.9	<0.001
At 2 days	5.45	2.6	<0.001
At 3 days	3.25	2.2	<0.001
At 7 days	1.55	1.25	<0.05
At 10 days	0.6	0.35	NS

Post-operative pain

Pain was evaluated by visual analogue scale. The data recorded from two groups was put to statistical analysis and 'p' value was calculated using independent t- test. The mean pain score for coblation technique averaged over 10 days was 2.72 and was 4.84 for dissection technique. When pain scores were compared between the two techniques for each individual evaluation, there were significant differences seen at 6, 12, 24, 48, 72 hours and 7 days. Beyond that, that pain was less by coblation, but differences was small and not significant.

Post-operative complications

There was no case of reactionary or secondary haemorrhage in either group.

Long term follow up (3-6 weeks)

By the third week slough was absent in both groups and smooth tonsillar fossa was visible.

DISCUSSION

Wang et al found coblation assisted group had a significantly shorter operative time and intraoperative bleeding than the control group.[12] Pediatric patients of coblation group had a better pain score on 1, 2, 3 days after operation than in control group, and there was no statistically significant difference on 4 to 10 days between the two groups. Di Businco et al showed surgery time ranged from 25-30 minutes for cold dissection and 30-35 minutes for the plasma device.[13] When performing tonsillectomy using cold dissection, the procedure required 12-15 surgical instruments and three suture packs. Mitic et al found there was no significant difference in operation time in two groups.[14] Intra-operative bleeding was significantly less in the coblation group. Coblation tonsillectomy reported less pain, quicker return to normal diet, quicker return to normal activity, and less use of analgesics over a 10-day period than patients undergoing dissection tonsillectomy.

In our study the mean operative time for dissection method was 42.9 minutes and that for coblation technique was 34 minutes. Thus it took an average of 9 minutes longer to perform for dissection method compared to coblation technique. This difference was statistically significant. The amount of blood lost on an average by dissection method was 51.8 ml, and by coblation technique it was 22.3 ml which was significantly less than dissection method.

Polites et al found coblation tonsillectomy causes significantly less pain during the first three postoperative days, when compared with dissection tonsillectomy.[15] No demonstrable benefit was shown on days 4-10. Timms et al showed significant reduction in post-operative pain and more rapid healing of the tonsillar fossae were found in the side removed by tissue coblation.[16] Temple et al concluded coblation technique offers significant advantages in the post-operative period, with rapid return to a normal diet and a drastic reduction in analgesic requirements following the surgery.[17]

In our study the mean pain score for coblation technique averaged over 10 days was 2.72 and was 4.84 for

dissection technique. When pain scores were compared between the two techniques for each individual evaluation, there were significant differences seen at 6, 12, 24, 48, 72 hours and 7 days. Beyond that, that pain was less by coblation, but differences was small and not significant.

CONCLUSION

We can conclude that coblation tonsillectomy is an easy to learn safe procedure with significant advantages in terms improving the quality of post-operative recovery compared to that following the cold dissection technique. But cost effectiveness of dissection method outweighs benefits of coblation at present in Indian scenario. Larger randomized studies would be required to confirm or refute the same.

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

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