

COMPARISON OF COBLATION AND COLD DISSECTION TECHNIQUES OUTCOME AMONG TONSILLECTOMY PATIENTS AT BIRAT MEDICAL COLLEGE AND TEACHING HOSPITAL

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ABSTRACT

Tonsillectomy is the most commonly performed surgery. Cold dissection tonsillectomy remains as the gold standard for tonsil removal, although it may increase risk for complication. Coblation tonsillectomy is a new technique. There are studies comparing these two methods of surgery and have shown coblation technique to cause less postoperative pain, less intraoperative time along with less intra and postoperative blood loss. In contrast, few studies have shown it to be ineffective in reducing postoperative bleeding. Hence more studies are still required. Thus the objective of the present study was to compare coblation and cold dissection techniques outcome among tonsillectomy patients at Birat Medical College and Teaching Hospital. The study intended to determine and compare the intraoperative time, intraoperative blood loss and postoperative pain in coblation and cold dissection tonsillectomy. This is a hospital based cross-sectional comparative study. Eighty-six patients underwent tonsillectomy during the study period of one year (15th February 2020 to 14th February 2021) in the department of ENT HNS, Birat Medical College and Teaching Hospital. Among 86 patients, 43 underwent cold dissection and 43 coblation tonsillectomy. Method of surgery was based on odd and even serial number of the patients during presentation. This study showed that intraoperative time, intraoperative blood loss and postoperative pain score was 16.77 ± 2.7 mins, 36.51 ± 128 ml and 6.28 respectively in coblation method and 37.84 ± 3.1 mins, 101.4 ± 12.7 ml and 7.88 respectively in cold dissection method. Hence coblation method is a safer and effective method of tonsillectomy compared to cold dissection which ultimately leads to less postoperative analgesic demands and early recovery.

KEYWORDS

Coblation, Cold dissection, Tonsillectomy

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INTRODUCTION

Palatine tonsils are situated in oropharynx within tonsillar fossa. They are collection of lymphoid tissue and play important role in immunology and defense mechanism by antibody secretion, especially secretory IgA. Due to unknown etiology, this protective mechanism sometimes fails and become a seat of infection causing recurrent sore throat, fever and other complications which requires the removal of diseased tonsils.¹ Tonsillectomies are very commonly performed surgeries worldwide. The most common indication for tonsillectomy is recurrent tonsillitis.² There are many different techniques of performing this surgery. Available techniques are cold knife dissection, coblation method, electrocautery, cryosurgery, harmonic scalpel, laser tonsillectomy, radiofrequency coblation method etc.³ There have been lots of controversies about tonsillectomy techniques that provide fewer complications.⁴

Traditional cold dissection tonsillectomy has remained the gold standard for tonsil removal.⁵ However this technique leaves the wound open to heal by secondary intention, which causes complications like pain and bleeding. Longer periods of wound recovery has the risk of pain as well as bleeding from the tonsillar bed.⁶ Thus many attempts were made to reduce post operative pain as well as pre and post operative bleeding.

Coblation tonsillectomy is a new technique introduced in 2001.⁷ Coblation (controlled ablation) is a plasma technology that is minimally invasive. When current from radiofrequency probe is passed through saline medium it breaks saline into sodium and chloride ions. These highly energized ions form a plasma field which is strong enough to break organic molecular bonds within soft tissues causing its dissolution.⁸ Many studies have been done to either confirm its efficacy or to reject it.⁹ There are studies comparing the traditional cold dissection tonsillectomy and coblation tonsillectomy. Studies have shown coblation technique to cause less bleeding and postoperative pain.^{10,11} Intra operative time and blood loss is also less in coblation tonsillectomy.¹² In contrast few studies have shown it to be ineffective in reducing postoperative bleeding.¹³ Hence more studies are still required for a clear conclusion.

Excessive bleeding is a life threatening

condition. Intra operative bleeding is the major complication of tonsillectomy which is commonly faced by surgeons. Thus many studies are concentrated to decrease these problems comparing various techniques.¹⁴ This type of study would be valuable in this setting where there has been no published literature that gives a definite conclusion regarding the advantage of any technique for tonsillectomy.

Thus the objective of the present study was to compare coblation and cold dissection techniques outcome among tonsillectomy patients at Birat Medical College and Teaching Hospital. This study intends to determine and compare the intra operative time, intra operative blood loss and post operative pain in coblation tonsillectomy and dissection tonsillectomy method.

MATERIALS AND METHODS

This is a hospital based cross sectional comparative study where all the patients with indication of tonsillectomy were selected consecutively as they presented during the study period of one year (15th February 2020 to 14th February 2021) in the department of ENT HNS, Birat Medical College and Teaching Hospital. Among 86 patients presented, 43 underwent cold dissection tonsillectomy and 43 underwent coblation tonsillectomy. Systematic random sampling was done where the method of surgery was based on odd and even serial number of the patients during presentation and divided into two groups. Patient with odd serial number were included in group 1 who underwent cold dissection method and even serial number were included in group 2 who underwent coblation tonsillectomy method. Written consent was taken from the patients before the surgery however they were not informed about the method of tonsillectomy done. Ethical clearance was taken from Institutional Review Committee of Birat Medical College.

Intra operative time, intraoperative blood loss and post operative pain was assessed in cold dissection and coblation tonsillectomy and was compared.

Patients less than 7 years old, patients with bleeding disorder, peritonsillar abscess and unilateral tonsillar hypertrophy were excluded from the study. All patients were given similar

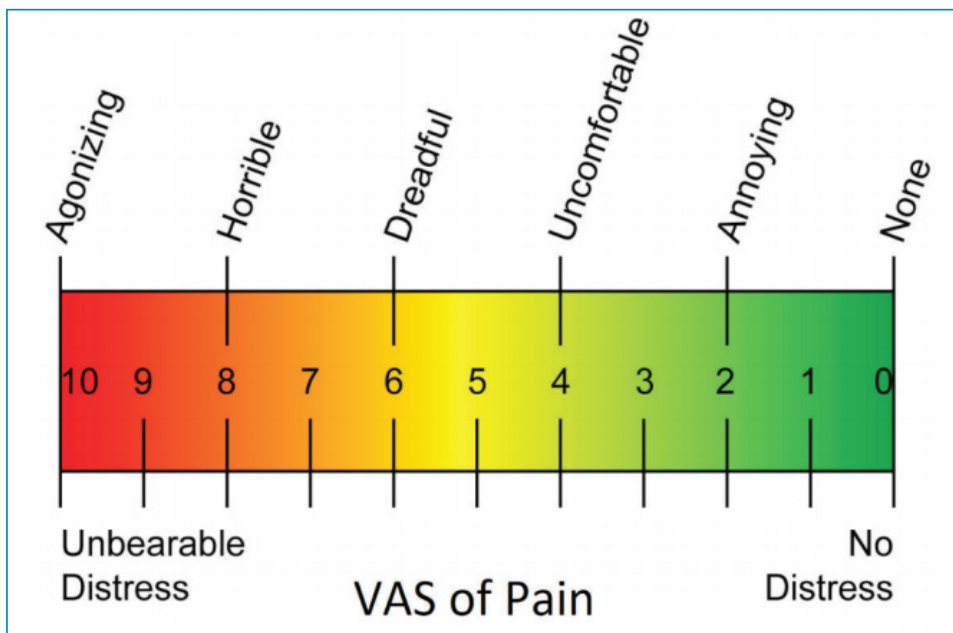


Fig. 1: Visual Analog scale (VAS).¹⁵

standardized anesthetic technique. Dissection tonsillectomy was done by blunt dissection and hemostasis was secured with bipolar diathermy. Coblation tonsillectomy was done by coblation assisted procedure using EVAC hand piece (Smith and Nephew, Evac 70 Xtra HP CNo: EI5874-01) and subcapsular dissection was done. Standard similar post operative analgesics and broad spectrum antibiotics was administered.

Operation time in each case was recorded from insertion to removal of Boyle-Davis mouth gag with Draffin’s bipod. Intraoperative blood loss for cold dissection tonsillectomy was measured by checking the volume of blood in suction jar after surgery. In case of coblation method blood loss was calculated by deducting the total amount of blood in suction jar with estimated saline used for the surgery.

Post operative pain was evaluated after 6 hours of surgery using Visual Analogue Scale (VAS) score. Prior to the surgery all patients were taught how to fill up post operative pain score forms.

All the findings were entered and compared using SPSS version 16. T-test was used to compare the findings.

RESULTS

Eighty six patients between 10-55 years of age presented during the period of one year

out of which 43 underwent cold dissection tonsillectomy and 43 underwent coblation tonsillectomy. Method of surgery was based on odd and even serial number of the patients during presentation and divided into two groups. Patient with odd serial number were kept under group one that underwent cold dissection method and even serial number were kept under group two that underwent coblation tonsillectomy. The mean age of group 1 was 30.67years while in group 2 was 27.95years. Group 1 comprised of 19 males and 24 females while group 2 comprised of 20 males and 23 females.

In this study the intraoperative time for group 1 ranged from 30 to 45 minutes and 15 to 25 minutes for group 2. The mean duration of surgery in group 1 was 37.84 ± 3.1 minutes (mins) while in group 2 was 16.77 ± 2.7 mins. This difference was statistically significant (p <0.001) (Table 1).

Table 1: Duration of surgery between groups		
Groups (method of surgery)	Mean ± SD (mins)	independent t-test
Group 1 (Cold dissection method)	37.84±3.1	P value <0.001
Group 2 (Coblation method)	16.77±2.7	

Table 2: Intra operative blood loss between groups

Groups	Mean ± SD (ml)	independent t-test
Group 1 (Cold dissection method)	101.4 ± 12.7	p-value <0.001
Group 2 (Coblation method)	36.51 ± 12.8	

The intra operative blood loss for group 1 ranged from 80 to 120ml and 15-50 ml in group 2. The mean in intra operative blood loss in group 1 was 101.4 ± 12.7ml as compared to mean blood loss of 36.51 ± 12.8 ml in group 2. This difference was statistically significant. (p value <0.001) (Table2)

Post operative mean pain score was evaluated for both groups using VAS. Mean pain score average after six hours of surgery was 7.88 in group 1 and 6.28 in group 2. Lower pain score was seen in group 2.

DISCUSSION

Tonsillectomy is the most common surgery performed. There are many advances in surgical techniques and anesthesia however intra operative and post operative complications like bleeding and pain remains a significant problem. Post operative pain inhibits chewing and swallowing that might lead to decrease in food intake ultimately leading to dehydration as well as delayed recovery. Reduced pain not only comforts the patient but also reduces risk of infection as well as post operative hemorrhage. Intra operative blood loss might lead to low circulating blood volume that influences the recovery rate especially in younger children.¹⁶

In our study 86 patients ranging from 10 -55 years of age underwent tonsillectomy in which 43 patients underwent tonsillectomy by cold dissection method and 43 by coblation method. There was no significant difference in the incidence among age distribution and gender.

The mean duration of surgery in cold dissection method was 37.84 ± 3.1 mins while in coblation was 16.77 ± 2.7 mins. This difference was statistically significant (P<0.001). Study by Lodh et al also showed statistical difference between two methods in terms of mean operating time, however the mean duration of surgery in both methods was lower as compared to our

study (9.7 ± 2.3min and 18.4 ± 4.1mins in cold dissection and coblation method respectively).¹⁵

Similar finding was found in study done by Farouk *et al* , Pramasivan *et al* and Hafiz *et al*.^{4,17,18} In their study also the intra operative time was significantly less in coblation method compared to cold dissection method. In contrary to this Moriniere *et al* in their study did not find any statistically significant difference between these two methods in terms of mean operating time.¹⁹

Intra operative blood loss was compared in surgeries performed by two methods, in cold dissection it was 101.4 ± 12.7ml and in coblation it was 36.5 ± 12.8ml which is about 64.9ml less. This difference was statistically significant (P<0.001). Similar finding was seen in study done by Lodh *et al* and Temple and Timms.^{7,15} Friedman *et al* in their study also obtained less than 20 ml to no blood loss in coblation method tonsillectomy.¹⁶

In contrary to study done by Hall *et al* and Chang *et al* where they found no significant difference in blood loss between these two methods.^{20,21} This could be due to Hall *et al* in their study included children hence tried to minimize blood loss as much as possible and Chang did the two methods in same patient in each of the tonsils. However they found significant difference in intraoperative time and post operative pain.

The post operative pain was measured using VAS in patients that underwent tonsillectomy done by both methods after six hours of surgery. Mean pain score was 7.88 by cold dissection method and 6.28 by coblation method. Lower pain score was seen in coblation method. Similar finding was seen in study done by Lodh *et al*.¹⁵ In their study they also compared post operative pain in 1st , 2nd and 10th postoperative days. This could be due to process of coblation method in which bipolar radiofrequency light is passed through isotonic saline to convert it into an ionized plasma layer, which disrupts intercellular molecular bonds in the tissues. Thus this generates a lower thermal effect compared to electrocautery (45 -85 °C) with subsequent presumption of diminished collateral thermal damage to surrounding tissues.

This study showed that coblation tonsillectomy method is a safer and effective method of

tonsillectomy. It causes very less per operative blood loss and minimal surrounding tissue damage. Along with less operative time and post operative pain as compared to cold dissection method that ultimately leads to less post operative analgesics demands and early recovery.

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