

COBLATION TONSILLECTOMY, IS IT SUPERIOR TO COLD STEEL METHOD?

Haider Sabri Hashim^{*}, Ahmed M Al-Abbasi[@] & Sabah Al-Urabi[#]

^{*}MB,ChB, FIBMS Specialist in ORL-H&N Surgery, Basrah Teaching Hospital. [@]MB,ChB, FIBMS, FRCS, Professor of ORL-H&N Surgery, Department of Surgery, College of Medicine, University of Basrah. [#]MB,ChB, FIBMS, Specialist in ORL-H&N Surgery, Al-Shifaa Hospital, Basrah, IRAQ.

Abstract

Coblation tonsillectomy is a new technique that was started in 1975, it involves passing a radiofrequency bipolar electrical current through a medium of normal saline, resulting in a plasma field of highly ionized particles which in turn break down intercellular bonds and thus melt tissue at around 40° to 70°C (in comparison with electrocautery which cuts tissues at 400°C)

The aim of this study is to evaluate the benefit of coblation tonsillectomy over conventional (cold steel) tonsillectomy, comparing tonsillectomy duration, blood loss during the surgery, and the postoperative pain.

This prospective randomised single-blinded clinical trial was done on 90 patients. Patients were divided into 2 equal groups; Group A: Underwent coblation tonsillectomy, and Group B who underwent cold steel tonsillectomy. The study was performed in Al-Musawy Private Hospital, Basrah Teaching Hospital, and Al-shifaa hospital, Basrah, Iraq. All surgeries were done by the three authors in the period between February 2018 to August 2020. The intraoperative bleeding, duration of surgery, and postoperative pain were evaluated and compared for both groups.

The age range of the studied patients was 4–32 years, 52 were males and 38 were females. The average duration of tonsillectomy procedure was 31.8 minutes in coblation tonsillectomy (Group A), while the average duration in the cold steel tonsillectomy (Group B) was 25.8 minutes. The average operative blood loss in cold steel tonsillectomy was 31.5 ml while that in coblation was 3.2 ml. Average postoperative pain in coblation group was (20.7± 6.15), while in cold steel group was (27.5±7.27).

In conclusion, coblation tonsillectomy is effective and beneficial in decreasing the volume of intraoperative blood loss but not for postoperative pain in comparison with conventional method, in addition that it take more time to be completed.

Key words: coblation, cold steel, tonsillectomy.

Introduction:

Celsus was the first person to recognize tonsillar disease and its relationship to infection performing the first tonsillectomy in 40 A.D¹. The tide turned in the 1980s, when Paradise et al demonstrated that surgery significantly improved patient outcome compared with medical therapy².

Chronic tonsillitis is one of the most common and frequent illness within otolaryngology. Tonsillectomy is also one of the most frequently performed surgical

procedure³. Improvements in the procedure of tonsillectomy which are many should have the advantage of decreasing the operating time, reduction in the intraoperative and postoperative blood loss, and reduction in postoperative morbidity namely pain.

Coblation is a new technique that was started in 1975. It involves passing a radiofrequency bipolar electrical current through a medium of normal saline resulting in a plasma field of highly

ionized particles, which in turn break down intercellular bonds and thus melt tissue at around 40° to 70°C (in comparison with electrocautery which cuts tissues at 400° C)⁴.

This study was carried out to evaluate the benefit of coblation tonsillectomy over conventional (cold steel) tonsillectomy, comparing tonsillectomy duration, blood loss during surgery, and the postoperative pain.

Patients and methods

This is prospective, randomized, single-blinded clinical trial included 90 patients. Forty five randomly selected patients underwent coblation tonsillectomy (Group A), the later 45 patients underwent cold steel tonsillectomy (Group B). The study was carried out in

Al-Musawy Private Hospital, Basrah Teaching Hospital and Al-Shifaa Hospital, Basra, Iraq in the period between February 2018 to August 2020.

The risk was mentioned to all the patients. Some of them refused to take part in the study, but all those who were included accepted the possibility of risk and gave their permission.

All of the included patients have recurrent acute tonsillitis above 3 years of age.

All patients with unilateral or asymmetrically enlarged tonsils, those who need adenoidectomy, or additional procedure like myringotomy, and those with bleeding tendency, were excluded.

All adult patients have paracetamol tab. 500mg thrice daily and 20mg/kg for children for 7 days.

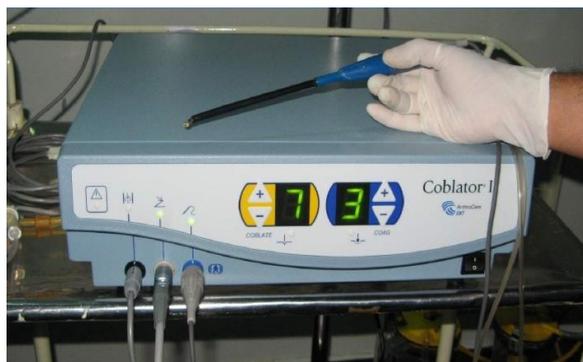


Figure 1: Coblation machine and probe.

Tonsillectomy operation duration was calculated as the time interval between the first application of coblator probe (Figure 1) or first incision, to the time when all bleeding and oozing was secured completely. The operative blood loss was calculated by weighing the blood impregnated gauze packs against an equal number of unused packs as well by measuring the volume of blood for each group separately. The volume of blood in the packs was calculated by dividing the weight of blood on the pack by the specific gravity of blood (1.055)⁵. Patient's follow-up was performed at operative day (after recovery), 1st, 3rd, 7th postoperative days in regard to pain.

Pain assessment was done using the numeric pain rating scale for adult and Wong baker faces scale for children (age 3 years and older), both scores from 0-10 (record from day 0,3,7,14), until returned to normal diet and activity. The “Wong baker faces” pain scale is a visual analogue scale that uses faces rather a line to identify the level of pain or discomfort that the child is experiencing. The children were asked by themselves or by the assistance of parents to point the “face” that best expresses the way that they feel.

The results of the study were statistically analyzed by using paired t-test for significance.

Results

The age range of the studied patients was 4–32 years, 52 were males and 38 were females. The average duration of tonsillectomy procedure was 31.8 minutes in coblation tonsillectomy (Group A), while the average duration in the cold steel tonsillectomy (Group B) was 25.8 minutes, which meant increment in tonsillectomy duration in coblation method. This is statistically not

significant (p-value >0.05). The average operative blood loss in cold steel tonsillectomy was 31.5 ml while that in coblation side was 3.2 ml. These results are statistically significant (p<0.0001). Average postoperative pain in coblation group was (20.7±6.15), while in cold steel group was (27.5±7.27) which is statistically not significant (p-value >0.05) as demonstrated in table I.

Table I: Comparison between coblation tonsillectomy (Group A) and cold steel tonsillectomy (Group B), regarding duration, blood loss and pain.

Group	Average
Duration of tonsillectomy in minutes	
Group A	31.8
Group B	25.8
Blood loss (ml)	
Group A	3.2
Group B	31.5
Average postoperative pain	
Group A	20.7 +- 6.15
Group B	27.5 +- 7.27

Discussion

The first known tonsillectomy was performed by Cornelius Celsus about 2000 years ago. After enucleating the tonsil with his fingernail, he suggested the fossae should be washed with vinegar and painted with a medication to reduce bleeding. Since that time techniques for faster tonsillectomy with less bleeding have been searched for and various haemostatic agents and technique been tried³.

One of randomized double blind study performed in 2012, described the duration of surgery of both coblation and cold steel methods, it found less duration of coblation compared to conventional method⁶. While Singh Rakesh et al found coblation has longer duration⁷. In the present study, coblation method takes longer duration (31.8 minutes) in comparison with conventional method (25.8 minutes), which is not statistically significant (p-value >0.05). Taking long duration of coblation method in

comparison with other studies is to decrease the manipulation as well as to secure all bleeding in time.

Izny Hafiz Zainon et al⁸ showed in his study that coblation tonsillectomy is superior in improving intraoperative efficiency in term of intraoperative time and bleeding compared to cold dissection tonsillectomy.

The mean Intraoperative blood loss in the present study for conventional method was 31.5 ml and for coblation method was 3.2 ml. which is statistically significant.

Paramasivam et al⁹, concluded that conventional tonsillectomy associated with greater blood loss. Vangelin et al¹⁰, illustrated intraoperative bleeding was significantly less in coblation. Hong et al¹¹, performed a study for children underwent tonsillectomy and verified that coblation tonsillectomy has lesser blood loss. Zaki¹² found significant advantages in operation time and intraoperative blood

loss compared with dissection tonsillectomy.

Izny Hafiz Zainon et al⁸, showed that coblation tonsillectomy does have superiority in decreasing bleeding compared to cold dissection.

The marked difference in blood loss between our study and other studies probably due to taking long time in coagulation in coblation to stop bleeding during operation.

Regarding postoperative pain, some studies reported no significant reduction in pain with coblation surgery which is agreeable with our study but Polites et al¹³, showed that coblation tonsillectomy was significantly less painful specially in the first 3 post-operative days. Timms et al¹⁴, suggested significant benefit of coblation tonsillectomy in regard of postoperative pain.

Jingjia Li et al¹⁵, showed that coblation method is a safe and effective technique that is capable of reducing postoperative

pain and hemorrhage.

Izny Hafiz Zainon et al⁸, stated that coblation tonsillectomy associated with minimal postoperative pain in comparison with conventional method.

Braverman et al¹⁶, stated fewer intraoperative and postoperative complications and less postoperative pain were observed with coblation

In the present study the average postoperative pain in coblation group was (20.7±6.15), while in cold steel group was (27.5±7.27) which is statistically not significant (p-value >0.05), we suggested that the slight decrement of postoperative pain probably due to less manipulation during coblation procedure.

Conclusion:

Coblation tonsillectomy is effective and beneficial in decreasing the volume of intraoperative blood loss but not for postoperative pain in comparison with conventional method, additionally, it takes more time to be completed.

References

1. Curtin JM. The history of tonsil and adenoid surgery. *Otolaryngol Clin North Am.* 1987; 20:415–419.
2. Paradise JL, Bluestone CD, Bachman RZ, Colborn DK, Bernard BS, Taylor FH, et al. Efficacy of tonsillectomy for recurrent throat infection in severely affected children - Results of parallel randomized and nonrandomized clinical trials. *N Engl J Med.* 1984;310:674–683.
3. Hydrogen peroxide 3%: Is it beneficial in tonsillectomy. Al Abbasi, Ahmed M. ; Saeed, Zahra K. J. *Arab Board Med. Special.* 2008; 9 (2): 19-22.
4. Philpott, C.M., A double-blinded randomized controlled trial of coblation versus conventional dissection tonsillectomy on postoperative symptoms *Clinical. Otolaryngology.* 2005; 30: 143–148.
5. Agrawal SR, Jain AK, Marathe D, Agrawal R. The effect of bismuth sub-gallate as hemostatic agent in tonsillectomy. *Indian J Oto-laryngol.* 2005;57:287–289.
6. Mohammadreza Omrani, et al Coblation versus traditional tonsillectomy: A double blind randomized controlled trial . *J Res Med Sci.* 2012; 17(1): 45-50 69.
7. Singh Rakesh et al A Prospective, Randomized, Double-Blind Study of Coblation versus Dissection Tonsillectomy in Adult Patients *Indian Journal Otolaryngology Head Neck Surgery.* 2012;64(3):290–296
8. Izny Hafiz Zainon, Rosdan Salim, Mohd Khairi Md Daud. Coblation tonsillectomy versus dissection tonsillectomy: A comparison of intraoperative time, intraoperative blood loss and post-operative pain. *Med J Malaysia .* 2014; 69:2 .
9. Paramasivam V K et al Randomised comparative study of adenotonsillectomy by conventional and coblation method for children with obstructive sleep apnoea. *Int J Pediatr Otorhinolaryngol.* 2012;76 (6):816-21.
10. Comparison of Common Tonsillectomy Methods. M.A. SattarTajmira SultanaTajmira Sultana Vangelin G et al *Mymensingh Medical Journal.*2016; 25(1):50-54.
11. Christopher Metcalfe, Jameel Muzaffar, Charles Daultrey & Christopher Coulson .Coblation tonsillectomy: a systematic review and descriptive analysis.*European Archives of Oto-Rhino-Laryngology.*2017; 274:2637–2647.
12. Zaki M F. Coblation versus Traditional Tonsillectomy: A Double Blind Randomized Controlled Trial. *Glob J Oto.* 2017; 6(3).
13. N Polites et al Post operative pain following coblation tonsillectomy randomized control trail. *ANZ Journal of Surgery* 2006; 76: 226–229
14. Coblation tonsillectomy: A double blind randomized controlled study. Michael Steven TimmsMichael Steven TimmsR H Temple. *The Journal of Laryngology & Otology.* 2002; 116(6):450-452.
15. Jingjia Li, Lixia Luo, Weixiong Chen , Jianli Zhang, Xuequan Deng, Lieqiang Liao, Xianping Zeng, Bin Wang. Application of Coblation Tonsillectomy with Inferior Pole Capsule Preservation in Pediatric Patients .*Laryngoscope,* 2020;25
16. Braverman, I., Nemirovsky, A., Klein, A., Sarid, M. and Avior, G. Coblation Intracapsular Tonsillectomy and Coblation Complete Tonsillectomy for Obstructive Sleep Apnea. *International Journal of Otolaryngology and Head & Neck Surgery.*2015; 4:350-355.