



A COMPARATIVE STUDY OF COBLATION VERSUS CONVENTIONAL TONSILLECTOMY

ENT

Dr.P. Ramakrishnaiah	Associate Professor, Department of ENT, Bhaskar Medical College, Yenkapally, Moinabad, RR District, Telangana.
Dr. SBV.Chandra Sekhar	Assistant Professor, Department of ENT, Bhaskar Medical College, Yenkapally, Moinabad, RR District, Telangana.
Dr. Roshini Arravothu	Post Graduate, Department of ENT, Bhaskar Medical College, Yenkapally, Moinabad, RR District, Telangana.
Dr. S. Indira Devi*	Professor & HOD, Department of ENT, Bhaskar Medical College, Yenkapally, Moinabad, RR District, Telangana. *Corresponding Author

ABSTRACT

Tonsillectomy is a surgery done for chronic tonsillitis. Various techniques are available for Tonsillectomy. Regularly used procedure is Dissection and snare Method. Because of latest innovations Coblation has emerged as a better tool for tonsillectomy with less bleeding and complications. Our study is done as a comparative study to know about the above both techniques. This study comprised of 100 patients with chronic tonsillitis who were above 3 years of age without adenoid hypertrophy. In half of the randomly selected patients, tonsils were removed by coblation method and remaining patient tonsils were removed by conventional method. The patients were examined regularly on first second and seventh post-operative days. Coblation tonsillectomy proved to be a better tool than conventional Tonsillectomy according to our study.

AIMS AND OBJECTIVES

1. To compare the efficacy of coblation and conventional tonsillectomy in randomly selected patients.
2. To compare morbidity and complications associated with these procedures by each method in randomly selected patients.

KEYWORDS

Tonsil, Tonsillectomy, Dissection and snare Method, Coblation Tonsillectomy

INTRODUCTION

Tonsillectomy is a very common surgical procedure. There are various modalities to perform tonsillectomy like dissection and snare, diathermy, laser, cryosurgery and coblation. Dissection and snare method is commonly done method. Other modalities are not used regularly, considering the cost of equipments. With the arrival of coblator, results of coblation tonsillectomy have been encouraging from many studies. Unlike most operative procedures, which are closed primarily, tonsillectomy produces an open wound that heals by secondary intention.

Pain and hemorrhage are the most common postoperative morbidities¹. Pain is due to the disruption of mucosa and irritation of glossopharyngeal nerve fiber followed by inflammation and spasm of the pharyngeal muscles which leads to ischemia and protracted cycle of pain; pain is not completely subsided till the muscle becomes covered with mucosa in 14–21 days after the surgery². Postoperative secondary hemorrhage is due to the infection of the tonsillar fossa resulting in disruption of vessels and bleeding³.

The various methods for tonsillectomy are dissection, guillotine, cryosurgery, monopolar and bipolar diathermy dissection, suction diathermy dissection, bipolar scissor dissection, Harmonic scalpel dissection, radio frequency surgery and laser surgery⁴.

Any improvement in these procedures should have the following advantages:

- i) Decrease in the operating time
- ii) Reduction in the intraoperative and postoperative blood loss
- iii) Reduction in postoperative morbidity

Coblation is a new technique that was started in 1997⁵, and 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 70°C (in comparison with electrocautery which cuts tissues at 400°C).

There are two different techniques for coblation tonsillectomy: (1) Subtotal, intracapsular ablation, in this technique some tonsil tissue may be left behind (2) Total, subcapsular dissection of tonsils, in which the entire tonsil is removed by dissecting between the tonsillar capsule and the surrounding pharyngeal muscle. In concordance with

other studies⁶ which state that subtotal tonsillectomy cannot be the best technique to use in chronic tonsillitis because tonsillar tissue is left behind and it could result in recurrent infections, so subcapsular technique was adopted in this study to evaluate and compare the efficacy of coblation and conventional method.

DISSECTION AND SNARE TONSILLECTOMY

Most common method of 'cold steel' tonsillectomy is the dissection technique⁷. Tonsil retracted medially, the mucosa overlying the tonsil capsule incised and plane of loose areolar tissue between the tonsil and the pharyngeal musculature dissected with steel dissectors, gauze or cotton wool until the tonsils fully mobilized. Blood vessels traversing the plane of dissection are dealt with either by ligature or diathermy as required. Traditional dissection remains the most frequently used method.

COBLATION TONSILLECTOMY

Coblation is controlled ablation popularized in 1997 with first commercial use in arthroscopy (1992). Coblation is a unique method of rapid and controlled removal of tissue at relatively low temperatures (typically 40°–70°C) while maintaining the integrity of surrounding tissue or structures. "Coblation" is a synthetic term that means "cold" and "removal".

Using radio frequency in a bipolar mode with a conductive solution, such as saline, Coblation energizes the ions in the saline to form a small plasma field. The field created consists of high energy particles like ionized vapour layers, OH, H, Na, free radicals⁸ and electron. It has enough energy to break the tissue's molecular bonds, creating an ablative path. The plasma's energized particles have sufficient energy to break molecular bond within the tissue, causing tissue to dissolve at relatively low temperatures (typically 40°C to 70°C). The result is volumetric removal of target tissue with minimal damage in the surrounding tissue. Depending on electrodes and power configuration it is also used for hemostasis.

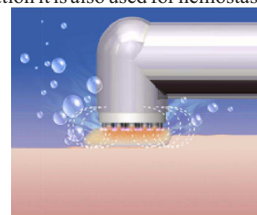


Figure No 1 – Plasma Field Created By Coblation

Plasma produces powerful tissue removal, lesser tissue temperature (40-70°C) and shallow depth of injury of 50-150 micro meter⁹ where as electro cautery it is 1.5mm depth. Good hemostasis is attained by ablation. The probes or 'wands' are of single use. The operation is performed in the standard way using the Arthro Care 2 assisted Evac-70 coblator wand. It has i) low frequency ii) Decreased tissue penetration iii) Minimal collateral tissue damage iv) Surface temperatures 40° to 70°C v) Shorter current path vi) Controlled energy delivery vii) Volumetric tissue removal.

Table : 1 : Comparison between Coblation and Electro surgery

	Coblation	Electrosurgery
Mechanism of action	Molecular Dissociation & controlled tissue plasma field	Cellular rupture via electricity arcing into tissue
Temperatures	40°C to 70°C	400°C to 600°C
Thermal penetration	Minimal	Deep
Effects on target tissue	Gentle removal, dissolution	Rapid heating, charring, burning, cutting
Effects on surrounding Tissue	Minimal dissolution	Inadvertent charring or Burning

Postoperative bleed rates were high in initial studies. Some of these bleeds may reflect lack of familiarity with the technique; some studies have reported bleed rates that are comparable with cold-steel dissection. It is suggested that postoperative pain is less than with conventional dissection but one study has cast doubt on this and shown that morbidity was less with cold steel dissection.

There are good controlled studies comparing coblation with cold steel dissection without the addition of diathermy; current evidence is inadequate to justify its introduction in preference to cold steel dissection with ties and/or packs. The National Institute for Health and Clinical Excellence (NICE) advice that current evidence is sufficient to support the use of electro-surgery (Diathermy and coblation) for tonsillectomy, but advise surgeons to ensure that they are appropriately trained and to make patients and parents aware.

MATERIALS AND METHODS

This study titled "comparative study of coblation versus conventional tonsillectomy" was done in the Department of Otorhinolaryngology, Bhaskar Medical College, Moinabad Rangareddy District Telangana, from October 2016 to October 2018. Chronic tonsillitis patients who had been identified as candidates for tonsillectomy were taken up for study were randomly selected. Pre-operative evaluation done using X-ray nasopharynx, diagnostic nasal endoscopy, impedance audiogram to exclude patients with associated adenoid hypertrophy and secretory otitis media.

INCLUSION CRITERIA

Chronic tonsillitis patients above the age of 3 years

EXCLUSION CRITERIA

1. Asymmetrical and unilateral enlarged tonsil
2. Children with chronic tonsillitis patients below the age of 3 years
3. Patients who needed Adenoidectomy, Myringotomy and Grommet insertion.

METHODS:

DETAILED HISTORY AND EXAMINATION OF PATIENTS

All patients included in study were subjected to detailed history taking and examination pertaining to ear, nose and throat

PRE OPERATIVE EVALUATION

All patients included in study were examined and investigated by the following methods.

1. Clinical examination
2. Pure tone audiometry (in selective cases for exclusion criteria)
3. Impedance audiometry (in selective cases for exclusion criteria)
4. X-Ray skull soft tissue lateral view (in selective cases for exclusion criteria)
5. Diagnostic nasal endoscopy (in selective cases for exclusion criteria)
6. Routine blood investigation (complete blood count, renal function tests)
7. Chest X-Ray, ECG

All patients who were planned for tonsillectomy were assessed for general anaesthesia.

After complete work up, patients were randomly selected and separated in to two groups, half of the patient tonsils are removed by using coblation and the others by conventional dissection method. Through this study, half of the randomly selected patients tonsils removed with coblation. The other half of the randomly selected patients tonsils removed with conventional dissection.

PROCEDURE

In conventional method, under general anaesthesia using orotracheal intubation, patient put in Rose position. After painting and sterile draping Boyle Davis mouth gag with tongue blade introduced. Tonsil was retracted medially and held by using Dennis Brown tonsil holding forceps. An incision made in the mucosal reflection site and the medial margin of anterior pillar. Plica semilunaris at the upper pole released. Posterior pillar mucosal reflection released with curved scissors. Tonsil dissected from its bed using Mollison dissector upto inferior pole and inferior pole snared. Tonsillar fossa packed. After pack removal haemostasis secured.

In Coblation method, under general anaesthesia using orotracheal intubation, patient put in Rose position. After painting and sterile draping Boyle Davis mouth gag with tongue blade introduced. Tonsil was retracted medially and held by using Dennis Brown tonsil holding forceps. Coblation of the tonsil from upper pole to inferior pole done, by using the Arthrocare 2 assisted Evac 70 coblation wands using 6 or 7 setting for coblation and 2 or 3 setting for ablation. Haemostasis secured.

Time needed to perform surgery, blood loss during surgery; post-operative pain, postoperative hemorrhage and extent of wound healing after surgery were recorded. Time taken from incision to attaining hemostasis was taken as duration of surgery. Intraoperative blood loss was measured by using separate collecting chambers for each method. In coblation method blood loss was calculated after deducting the amount of saline used from total collection.

Postoperative pain was assessed on first, second and seventh postoperative day. The pain was assessed using visual analog scale (VAS)¹⁰ (0-10) which consists of a line, usually 10 cm long. The ends are labeled as the extremes ('no pain' and 'pain as bad as it could be') and the rest of the line is blank.

The patient is asked to put a mark on the line indicating their pain intensity. The distance between that mark and the origin is measured to obtain the patient's score. Patients were enquired about the pain during the first, second and seventh postoperative day. The area of slough in tonsillar fossa was assessed by direct visual examination. The extent of healing within the tonsillar fossa is estimated by recording the percentage of the fossa that had remucosalized. The episodes of postoperative bleeding from the tonsillar fossa were documented including the day on which it occurred and the interventions required to stop it.

OBSERVATION AND RESULTS

This study comprising of 100 patients was conducted in the Department of Otorhinolaryngology, Bhaskar Medical College, Bhaskar General Hospital from October 2016 to October 2018. Chronic tonsillitis patients with adenoid hypertrophy and serous otitis media were excluded by diagnostic nasal endoscopy, imaging and impedance audiogram.

Chronic tonsillitis patients identified as candidates for tonsillectomy. They were selected randomly and half of the patient tonsils were removed using coblation and the other by conventional dissection method. All patients were examined regularly after surgery on first, second and seventh post-operative days to assess the post-operative morbidity and efficacy of both conventional and coblation methods.

Out of 100 patients, 8 patients who did not come for follow up were excluded from the study. The rest of the patients 92 in number were regularly followed up the results were compared and analysed using chi square testing.

AGE DISTRIBUTION:

Table No 2: Age Distribution among Patients

Age in years	Patients
3to 5	4(4%)
6 to10	8(8%)
11 to 15	16(16%)
16 to 20	30(30%)
21to 25	22(22%)
>25	20(20%)
Total]	100

It is seen that majority of patients were in the age group 16-20 (30%). The next majority age group was 21-25 years (22%).

Table No 3: Gender Distributions of Patients

Sex	Patients
Female child	8(8%)
Male child	4(4%)
Female	48(48%)
Male	44(44%)

The total number of females was 48(48%). The total number of males were 44(44%) the total number of female children are 8(8%). The total number of male children are 4(4%).

Table No. 4: Comparison of Duration of Surgery in Minutes

SURGERY	COBLATION	CONVENTIONAL	T-value	P-value
DURATION Min	29.1	26.9	-1.57	> 0.05

Table No.5: Mean, Standard Deviation and Standard Error (Duration of Surgery)

DS in Min	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	50	26.9	5.757	0.814
COBLATION	50	29.1	8.094	1.144

Table No.6: Independent t-Test (Duration Of Surgery)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	2.452	.05	-1.57	98	.000	-2.200	1.151	-4.98	0.587
Equal variances Not assumed			-1.57	88.48	.000	-2.200	1.618	-4.99	0.591

The mean duration is measured from giving incision over the tonsil upto achieving complete hemostasis, for coblation tonsillectomy the mean duration was 29 minutes and 01 seconds and for conventional tonsillectomy mean duration was 26 minutes and 09 seconds thus it took an average of 2 minutes 52 seconds to perform coblation procedure compared to conventional technique and this difference is no statistical significance T value is -1.57 (p value>0.05).

Table No. 7: Comparison of Intra Operative Blood Loss in Milleliters

SURGERY	COBLATION	CONVENTIONAL	T value	P value
IOP BLOOD LOSS ml	53.06	85.40	10.02	0.000

Table No.8: Mean Standard Deviation Standard Error Mean (Intra Operative Blood Loss)

IOP blood loss	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	50	85.40	21.472	3.036
COBLATION	50	53.06	1.545	1.092

Table No. 9: Independent t-Test (Intra Operative Blood Loss)

Independent Samples Test									
		Levene's Test For Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2- tailed)	Mean Differ ence	Std. Error Differ ence	95% Confidence Interval of The Difference
									Lower Upper
	Equal varia nces	100 .41	.00	10.02	98	.000	32.34 0	4.295	25.93 5 38.74 4
	assu med		0						
	Equal varia nces			10.02	61. 49				25.88 7 38.79 2
	not					.000	32.34 0	1.656	
	assu med								

The amount of intra operative blood loss on an average in coblation method was approximately 53.06 ml and the amount of intra operative blood loss in conventional was 85.4 ml. The difference was t-value (10.02) p value(0.000) statistically significant.

Table-10: Comparison of Post-Operative Pain in First, Second and Seventh Post-Operative Days

POSTOPERATIVE DAY PAIN SCALE	COBLATION	CONVENTIONAL	t-value	P Value
1 st pod	4	8	-16.528	0.001
2 nd pod	4	6	-14.392	0.001
7 th pod	3	4	-3.11	0.002

**Table No 11 Mean Standard Deviation Standard Error Mean
(1st Post Operative Day Pain)**

Post operative pain VAS scale	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	50	7.42	1.180	.167
COBLATION	50	3.92	.922	.130

Table No. 12 - Independent T Test (1st Post Operative Day Pain)

		Test for Levene's Equality of Variances			t-test for Equality of Means				
	F	Sig.	T	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal Variances assumed	3.326	.071	16.52	98	.000	3.500	.212	3.080	3.920
Equal variances not assumed			16.52	92.611	.000	3.500	.212	3.079	3.921

**Table No 13 Mean Standard Deviation Standard Error Mean
(2nd Post Operative Day Pain)**

2 nd Post operative pain VAS scale	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	50	6.2000	.96890	.13702
COBALTION	50	3.6400	.80204	.11343

Table No.14 - Independent t-Test (2nd Post Operative Day Pain)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.541	.464	14.392	98	.000	2.56000	.17788	2.2071	2.9129
Equal Variances not assumed			14.392	94.696	.000	2.56000	.17788	2.20685	2.91315

Table No 15 Mean Standard Deviation Standard Error Mean (7th Post Operative Day Pain)

7 th Post operative pain VAS scale	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	46	3.8261	.70881	.10451
COBLATION	46	2.9783	.99976	.14741

Table No.16- Independent t-Test (7th Post-Operative Day Pain)

Levene's Test for Equality of Variances	t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
								Lower Upper
	3.661	.059	4.692	90	.000	.84783	.18070	.48884 1.20681
			4.692	81.114	.000	.84783	.18070	.48831 1.20734

Sixty to Seventy percent of patients said that the side they underwent coblation was less painful in overall, than the other side on which conventional was used. Other thirty percent said that conventional side was less painful and this was statistically significant. Pain was measured by VAS scale. Under this scale the mean pain averaged over 7 days was 3.44 with coblation and 6 for conventional method.

Table No. 17-Comparison of Tonsillar Fossa Healing on First, Second and Seventh Postoperative Day

Post-operative day healing	Coblation (%)	Conventional (%)	Chi square	P value
1 st POD	81	40	35.17	0.0001
2 nd POD	77.2	47.1	19.10	0.0001
7 th POD	48.5	18.9	20.05	0.0001

Table No. 18- Mean Standard Deviation Standard Error Mean (1st Post Operative Day Tonsillar fossa Healing)

1 st POD Tonsillar fossa healing	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	50	39.8000	7.88696	1.11538
COBLATION	50	80.3000	7.02837	.99396

Table No. 19- Independent 't' Test (1st Post Operative Day Tonsillar fossa Healing)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed									
not assumed									

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.459	.230	-27.108	98	.000	-40.5000	1.49400	-43.46480	-37.53520
not assumed			27.108	96.726	.000	-40.50000	1.49400	43.46529	37.53471

Table No. 20 - Mean Standard Deviation Standard Error Mean (2nd Postoperative Day Tonsillar fossa Healing)

2 nd POD Tonsillar fossa healing	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	50	47.2000	5.16661	.73067
COBLATION	50	73.6000	20.70295	2.92784

Table No. 21- Independent 't' Test (2nd Post Operative Day Tonsillar fossa Healing)

Levene's Test for Equality of Variances	t-test for Equality of Means							
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
								Lower Upper
Equal variances assumed	43.318	.000	8.749	98	.000	-26.4000	3.01764	32.38840 20.41160
Equal variances not assumed			8.749	55.080	.000	-26.4000	3.01764	32.44728 20.35272

Table No. 22- Mean standard deviation standard error mean (7th post operative day Tonsillar fossa healing)

7 th POD Tonsillar fossa healing	N	Mean	Std. Deviation	Std. Error Mean
CONVENTIONAL	46	18.6957	8.72001	1.28570
COBLATION	46	48.4783	7.52991	1.11022

Table No. 23- Independent 't' Test (7th Post Operative Day Tonsillar fossa Healing)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed									
not assumed									

Each tonsillar fossa was assessed for healing in terms of percentage of

tonsillar fossa that was covered with slough formation. This process was early in coblation and remained for long duration of time the percentage of slough formation in tonsillar fossa was 80%, 74% and 45% respectively in 1st, 2nd and 7th post operative days whereas in conventional method it was 40%, 47% and 17%.

POST OPERATIVE BLEEDING

There was no case of reactionary or secondary hemorrhage in both coblation and conventional method.

DISCUSSION

Tonsillectomy is a very common surgery done worldwide by any ENT surgeon. Among various techniques available for tonsillectomy, dissection and snare method is still preferred by most ENT surgeons. The main aim of this study is to compare the efficacy of coblation method with conventional tonsillectomy in randomly selected patients undergoing tonsillectomy.

PATIENTS PROFILE AGE

In our study it is found that 30% of patients in age group 16-20 which was the predominant one, similar age distribution was adapted in studies conducted by Paramasivam V K⁶⁶ et al(2012), Fried man⁶⁷ et al 2004.

GENDER

Almost equal male to female distribution was found in study most studies did not show much influence of gender.

DURATION OF SURGERY

In our study the mean duration of surgery for coblation method is 29.1 min (ranging from 16 min to 43 min) the mean duration of surgery for conventional method is 26.9 min (ranging from 15 min to 36 min) Omrani et al (2012) described the duration of surgery in their studies showed evidence that coblation method had less duration compared to conventional method. Singh Rakesh et al (2012)⁶⁹ described similar studies and found coblation has longer duration. In our study coblation method takes longer duration. The p value is > 0.05 and it is not significant.

INTRA OPERATIVE BLOOD LOSS

The mean Intraoperative blood loss in conventional method was 85.40ml ranging from 60ml to 140ml and for coblation method was 53.06ml ranging from 35ml to 63ml. Paramasivam VK¹¹ et al [2012] described conventional tonsillectomy associated with greater blood loss. Vangelin.G¹² et al [2013] a meta-analysis report showed intra operative bleeding was significantly less in coblation.

Hong SM et al¹³ [2013] conducted a study in pediatrics patients undergoing tonsillectomy and demonstrated coblation tonsillectomy has lesser blood loss. Similar studies were done by Omran et al(2011) and Suresh et al(2012). In our study we found that conventional (85.40ml) had more amount of blood loss compared to coblation (53.06ml) p value 0.000 is statistically significant.

POST OPERATIVE PAIN

Initial studies on coblation showed a significant decrease in post operation pain scores comparing with conventional method. On other hand, some studies reported no significant reduction in pain with coblation surgery. Nastasha Polites et al¹⁴ (2006) described coblation tonsillectomy was significantly less painful and also found coblation method caused less pain in first 3 post-operative days.

Timms MS¹⁵ et al suggested significant benefit in post-operative pain levels in coblation method. In our study we found pain was significantly less on 1, 2, & 7th POD.

Pain in coblation method and the p-values<0.001, <0.001, <0.002 respectively and statistically the pain was significantly less.

POST OPERATIVE TONSILLAR FOSSA HEALING

The tonsillar fossa healing was delayed on Coblation method by presence of slough in the fossa on 1st, 2nd and 7th post operative day. Coblation causes early slough formation and delayed healing.

Temple RH et al¹⁶ described coblation has advantages in post-operative period & rapid return to normal diet.

POST OPERATIVE HEMORRHAGE

Noon et al¹⁷ described significantly higher hemorrhage rate in coblation comparing with diathermy. Divi V et al¹⁸ in a retrospective study found no statistical difference between hemorrhage rates for coblation versus non-coblation tonsillectomy techniques. In our study there was no reactionary or secondary hemorrhage in any patient.

SUMMARY

In our study the predominant age group was found to be 16-20 years. There was no significant difference in the incidence among age distribution and gender and it does not seem to significantly affect the study outcome.

The duration of surgery in coblation method was compared with conventional method. It was 26.9 minutes in conventional and 29.1 minutes in coblation. The intraoperative blood loss was compared in both methods. In coblation method it was 53.06ml and in conventional method it was 85.40ml, so obviously 32.34ml of intra operative blood loss was minimized in coblation method.

The post-operative pain which was measured using VAS scale was compared in both methods on first, second and seventh postoperative days for coblation the mean postoperative pain scores were 3.92, 3.64 and 2.74 respectively whereas in conventional method 7.42, 6.20 and 3.52 so about 60-70% patients had lesser pain in coblation method compared to the conventional method.

The postoperative tonsillar fossa healing was estimated by the amount of slough covered in tonsillar fossa and it was compared on first, second and seventh postoperative days. In coblation method mean area of slough covered was 80%, 74% and 4.5% respectively and on conventional method it was 40%, 47% and 18% respectively. So slough formation is more in coblation method compared to conventional method so the healing was delayed.

There was no primary or secondary hemorrhage in our study. These results were analysed and compared using chi-square testing and it was found to be statistically significant.

CONCLUSION

This study was conducted in the Department of Otorhinolaryngology, Bhaskar Medical College, Bhaskar General Hospital, to compare the efficacy of coblation and conventional tonsillectomy in randomly selected patients.

This study comprised of 100 patients with chronic tonsillitis who were above 3 years of age without adenoid hypertrophy. In half of the randomly selected patients, tonsils were removed by coblation method and remaining patient tonsils were removed by conventional method. The patients were examined regularly on first second and seventh post-operative days.

From our prospective study we reach the following conclusions:

1. Coblation tonsillectomy is relatively easy technique to perform providing a near bloodless field and minimal surrounding tissue damage.
2. The operative time required to perform coblation tonsillectomy was more than the conventional method. The longer time did not cause more intra operative blood loss and post-operative pain.
3. The intra operative blood loss was significantly less by coblation method, when compared to conventional method.
4. Most importantly, postoperative pain scores were significantly lower by the coblation tonsillectomy method on the first, second and seventh postoperative days. It helps the patients to resume their normal activities early.
5. Healing was slightly delayed by coblation tonsillectomy method.

To conclude, coblation tonsillectomy is easy to perform and it is safer with significant advantages in terms of decrease in intra operative blood loss and postoperative morbidity. But the only deterring factor in the regular usage of coblation is the cost factor which has to be overcome.

REFERENCES

1. Mohammad Reza Omrani, et al. Coblation versus traditional tonsillectomy: A double blind randomized controlled trial, 2012; J Res in Med Sci 2012; 17(1): 45-50
2. Singh Rakesh et al. A Prospective, Randomized, Double-Blind Study of Coblation versus Dissection Tonsillectomy in Adult Patients Indian Journal Otolaryngology, Head and Neck Surgery (July–September 2012) 64(3):290–294.
3. Dempster JH. Post-tonsillectomy analgesia: the use of benzocaine lozenges. o Journal

- Laryngology, Otolaryngology, 1988; 102:813-814.
4. Baily BJ. Tonsils and adenoids: snapshots from the laryngoscope scrapbook. *Laryngoscope* 1997; 107:301-306.
5. Philpott, C.M. et al. A double-blinded randomized controlled trial of coblation versus conventional dissection tonsillectomy on postoperative symptoms. *Clinical Otolaryngology*. 2005; 30, 143-148.
6. Friedman M, et al. Radiofrequency tonsil reduction: safety, morbidity, and efficacy. *Laryngoscope* 2003; 113:882-887
7. Pinder D et al. Dissection versus diathermy. *Cochrane Database of Systematic Reviews*. Parker, 45
8. Philpott, C.M. et al. A double-blinded randomized controlled trial of coblation versus conventional dissection tonsillectomy on postoperative symptoms. *Clinical Otolaryngology*. 2005; 30, 143-148
9. Burton MJ, et al. Coblation versus other surgical techniques for tonsillectomy. *Cochrane Database Systematic Review* 2007; (3): CD004619
10. N Polites et al. Post operative pain following coblation tonsillectomy randomized control trial. 2006; 76:226-229
11. Paramasivam V K et al. Randomised comparative study of adenotonsillectomy by conventional and coblation method for children with obstructive sleep apnoea. 2012 Jun; 76(6):816-21.
12. Vangelin G et al. Meta analysis of intra operative blood loss in various methods of tonsillectomy. 2012; 12-14
13. Hong S M et al. Coblation tonsillectomy in paediatric patients. 2013; 22-28
14. N Polites et al. Post operative pain following coblation tonsillectomy randomized control trial. 2006; 76: 226-229
15. Timms MS, et al. Coblation tonsillectomy: a double blind randomized Controlled study. 2003 Sep; 117(9):704-6
16. Temple RH et al. Paediatric coblation tonsillectomy. 2002 Jun; 116(6):450-26
17. Noon AP et al. Increased post-operative haemorrhage seen in adult coblation tonsillectomy. *Journal Laryngology Otolaryngology* 2003; 117:704-706
18. Divi V, Benninger M et al. Postoperative tonsillectomy bleed: Coblation versus non-coblation. *Laryngoscope* 2005; 115:31-33.