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Original Research Article

Comparison of post-operative pain in tonsillectomy: a three years prospective study

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ABSTRACT

Background: Tonsillectomy is the oldest surgery performed by otorhinolaryngologists worldwide. Through ages different techniques have been tried to improve the post-surgical outcome and reduce morbidity among patients. Aim of the current study was to compare the post-operative pain among the patients undergoing tonsillectomy by cold dissection, bipolar cautery dissection and coblation dissection.
Methods: 142 Patients undergoing tonsillectomy in ENT department of TMMC during the period of 3 year were included in the study. Patients were randomly distributed to undergo different techniques of tonsillectomy. The post-operative pain in patients was assessed using the pre-standardized visual analogue pain scale and results were analyzed.
Results: No statistically significant difference was found among the groups undergoing tonsillectomy by cold dissection, bipolar dissection and coblator dissection as the $p>0.05$. The immediate post-operative pain was found to be slightly higher among the group undergoing tonsillectomy by coblator dissection and the analgesics dose needed in the post-operative period remained the same for all for patients of all the three groups.
Conclusions: No statistically significant difference was found in the post-operative pain scores of patients undergoing tonsillectomy by CD, BD and CBD techniques.

Keywords: Tonsillectomy, Post-operative pain, Analgesics, VAS score

INTRODUCTION

Tonsillectomy is among the one of the commonest surgeries performed by otorhinolaryngologists worldwide. The earliest tonsillectomy in literature date back to 1000 BC where it was performed by Sushruta in India.[1] The practice of tonsillectomy as a safe procedure started from Celcus a Roman aristocrat (25 AD to 50 AD) who described the technique by using his finger for dissection.[2] After 100 years the surgery was evolved with different techniques being employed to make it a safer procedure and improve the post-operative outcome. The various indications for tonsillectomy in a patient range from chronic tonsillitis, peritonsillar abscess, suspicious of malignancy to tonsillar hypertrophy causing obstructive sleep apnea and in styloid process excision. The different techniques used for tonsillectomy include cold dissection, bipolar cautery dissection, gulliotine tonsillectomy, ultrasonic dissection, coblator dissection, laser tonsillectomy, microdebrider tonsillectomy while none of the technique can be accepted as the best with best outcomes compared to others. [3-10]

Coblation makes use of radiofrequency energy.[11] This radiofrequency energy when passes through a conductive medium like normal saline, breaks saline into sodium and chloride ions. These highly energized ions form a plasma field and break intercellular bonds within soft tissue causing its dissolution. Temperature achieved during this procedure is between 60-70°C in comparison to

electrocautery where temperature reached between 400-600°C.

The post-operative pain is one of the major morbidity factor in tonsillectomy patients.[12] Some study shows coblation give a better result in view of post-operative pain while other study remain equivocal.[13-15]

Current study mainly aims to compare and analyze whether there is any statistically significant difference in the post-operative pain in patients undergoing tonsillectomy by CD, BD and CBD techniques.

METHODS

Study setting

Patients who had indications and were planned for elective tonsillectomy in ENT department of TMMC and research center, Moradabad.

Study design and duration

Current study is a randomized prospective observational study, conducted for three years from December 2016 to November 2019.

Sample size

Sample size for present study was 142 patients who underwent tonsillectomy during the above given period were included in the study.

Inclusion criteria

Inclusion criteria for current study were patients of age group between 5 to 50 years, patients with complain of recurrent tonsillar infections i.e. chronic tonsillitis; 7 or more episodes/year or 5 or more episodes/year for 2 years or 3 or more episodes/year for 3 years and patients with complain of obstructive symptoms related to tonsil hypertrophy.

Exclusion criteria

Exclusion criteria for current study were need of any concurrent surgery other than tonsillectomy like adenoidectomy, myringotomy with ventilation tube insertion, patients with acute tonsillitis, impaired mental status of patient, any bleeding disorder and hypersensitivity/allergy to drugs involved in procedure.

Procedure

Tonsillectomies by all three techniques were done under general anaesthesia with endotracheal intubation. Patients were placed in supine position with extension at the neck using a shoulder roll (rose position). A Boyle-Davis mouth gag was used to keep the mouth open and it was fixed using Draffins metallic bipod stand. A tonsil holding forceps was used to pull the tonsil medially and incision was given in the superior pole of the tonsil using the tooth forceps in the CD technique. The tonsil was dissected from underlying bed by gauze dissection till the inferior pole. The inferior pole tonsil was snared using Eve's tonsillar snare. The bed of the tonsil was observed for any bleeding point and any bleeding point found was ligated using 3-0 vicryl sutures.

In bipolar dissection after general anaesthesia and similar positioning of the patient, bipolar cautery was used to give incision in the superior pole of the tonsil and the same was used to dissect the tonsil from the bed. Snaring of the inferior pole was done using the Eve's tonsillar snare. The bleeding point if any found were cauterized using bipolar cautery.

The CBD tonsillectomy was done using a coblator under microscope. The dissection was started at the inferior pole of the tonsil and continued till the superior pole. Irrigation with normal saline and simultaneous suctioning was done during the surgery followed by coagulation of the bleeding points using the coblator.

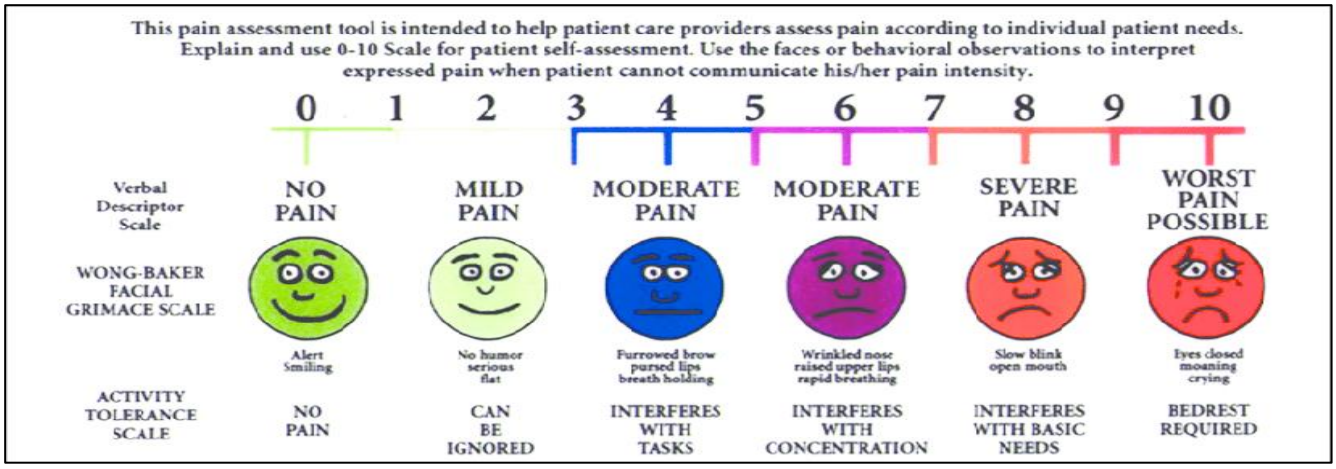

Figure 1: Visual analogue pain scale.

Patients were discharged 48 hours after the surgery and were given a combination of ibuprofen and paracetamol syrup based on their body weight three times a day for 5 days and intravenous diclofenac was given as rescue therapy in case of more pain based on body weight on day 1, 3, 7 and 14. Post tonsillectomy pain was assessed using standard visual analogue pain scale (Figure 1).

Result analysis

The post-operative pain and demographic data was compared among the three tonsillectomy groups. Standardized VAS was used to assess the post-operative pain among the groups. The statistical differences among the variables were tested using the Chi-square test. The results were analysed using a confidence interval of 95% and significant $p<0.05$.

RESULTS

Age and sex

142 patients were included in the study, out of which 86 patients (61%) were males and 56 patients (39%) were females. The mean age group of patients was 28.4±3.3 years. 48 patients with mean age of 26.1±5.8 years ranged between 5-50 years underwent tonsillectomy by cold dissection method, 44 patients with the mean age of 28.6±2.3 years underwent tonsillectomy by bipolar dissection method and 50 patients with a mean age group of 27.4±7.1 years underwent tonsillectomy by coblator dissection.

Post-operative pain

Post-operative pain scores were assessed using VAS scoring. The mean VAS score for post-operative pain in patients who underwent tonsillectomy by cold dissection method were 4.7 on day 1, 6.14 on day 3, 4.89 on day 7 and 1.26 on day 14. The patients who underwent tonsillectomy by bipolar dissection method had mean VAS score of 4.28 on day 1, 6.26 on day 3, 5.10 on day 7 and 1.4 on day 14. The mean VAS scores for patients who underwent tonsillectomy by coblator dissection were 6.01 on day 1, 6.33 on day 3, 5.12 on day 7 and 1.38 on day 14. A statistically significant difference was found in day 1 of post-operative period among three groups ($p=0.01$) while the mean pain scores on day 3, 7 and 14 showed no significant difference among the three groups (Table 1).

Table 1: VAS pain score comparison on day 1, 3, 7 and 14 by cold dissection, bipolar and coblator dissection techniques.

Days	Cold dissection (N=48)		Bipolar dissection (N=44)		Coblator dissection (N=50)		P value
	Mean	SD	Mean	SD	Mean	SD	
Day 1	4.57	2.07	4.28	2.01	6.01	2.12	0.011
Day 3	6.14	2.20	6.26	2.28	6.33	2.33	0.642
Day 7	4.89	2.11	5.10	2.14	5.12	2.18	0.628
Day 14	1.26	1.18	1.4	1.26	1.38	1.20	0.936

DISCUSSION

For tonsillectomy patients post-operative pain remains one of the major morbidity factors. Over years different technique have been evolved to reduce morbidities due to tonsillectomy. Researchers had done many studies but a controversy regarding best technique for tonsillectomy still persists.

Study of Silveira et al suggests that there is more pain in patients having bipolar electrodissection tonsillectomy than cold dissection. Similar finding was reported by studies of Adoga and Mofatteh et al.[16-18] Mofatteh et al recorded the pain after 4 and 24 hours after operation. In our study we do not find any significant difference of pain intensity between two groups while scaling pain intensity at day 1, 3, 7 and 14 after operation. While a study done by Pang suggests no significant difference of pain between bipolar electrodissection tonsillectomy and cold dissection, which is more consistent with our finding.[5]

As coblator uses radiofrequency energy and produces a temperature of 60-70°C during procedure, it is being hypothesized to cause less post-operative pain.[15] The study of Burton et al was not able to found adequate evidence in support of superiority of coblation tonsillectomy in view of post-operative pain. Parker et al performed a randomized controlled trial on children between 4 to 16 years, found that coblation tonsillectomy is not superior to cold dissection with bipolar haemostasis technique in terms of post-operative pain but yet the amount of analgesics required was less in coblation tonsillectomy group.[19] Likewise studies of Hong et al and Stoker et al had the same conclusion. Hong et al had performed their study on 80 patients over 16 years age and found no significant difference in post-operative pain in two groups of coblation tonsillectomy and electrocautery tonsillectomy but a tendency of lesser pain in coblation group.[20] Study of Stoker et al included patients aged between 3 to 12 years and compared coblation tonsillectomy with conventional electrosurgical tonsillectomy, found no significant difference in post-operative pain.[21]

While studies of Bellosa et al, Parson et al and Polites et al found superiority of coblator in terms of post-operative tonsillectomy pain.[14,22,23] Study of Bellosa et al found less post-operative pain in patients of coblation group compared to dissection group.[14] Parson et al performed study on 134 patients and observed the post-operative patients for 10 days.[22] In their study they reported less pain in coblation tonsillectomy group than other groups (electrocautery and ultrasonic scalpel), while pain in electrocautery and ultrasonic scalpel group did not differ significantly. Polites et al compare post tonsillectomy pain of 20 adult patients by coblation and dissection method and found coblation to be significantly less painful during the first 3 days while no significant difference shown on 4 to 10 days.[23]

In current study we found a statistically significant higher pain scores in patients who underwent coblation tonsillectomy on first post-operative day while the pain scores on post-operative day 3, 7 and 14 were similar in all groups with no significant differences between them.

CONCLUSION

Statistically significant pain scores were found on post-operative day 1 ($p<0.05$) between the three techniques with higher pain scores in patients who underwent coblation tonsillectomy. The pain scores on post-operative day 3, 7 and 14 were similar with no significant differences between them. However, studies with larger sample size are needed to prove conclusively whether any difference exists in various techniques of tonsillectomy or not.

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REFERENCES

1. Young J, Bennett J. History of tonsillectomy. ENT News. 2004;13:34-5.
2. Curtin J. The history of tonsil and adenoid surgery. Otolaryngol Clin North Am. 1987;20:415-9.
3. Worthington TC. A simple method of excision of the faucial tonsil. JAMA. 1907;48:1761-2.
4. Haase FR, Noguera JT. Hemostasis in tonsillectomy by electro-cautery. Arch Otolaryngol. 1962;75:125-6.
5. Pang Y. Paediatric tonsillectomy: bipolar electro-dissection and dissection/snare compared. J Laryngol Otol. 1995;109:733-6.
6. McGuire NG. A method of guillotine tonsillectomy with an historical review. J Laryngol Otol. 1967;81:187-95.
7. Weingarten C. Ultrasonic tonsillectomy: rationale and technique. Otolaryngol Head Neck Surg. 1197;116:193-6.
8. Martinez SA, Akin DP. Laser tonsillectomy and adenoidectomy. Otolaryngol Clin North Am. 1990;20:371-6.
9. Saleh HA, Cain AJ, Mountain, RE. Bipolar scissor tonsillectomy. Clin Otolaryngol Allied Sci. 1999;24:9-12.
10. Sobol SE, Wetmore RF, Marsh RR, Stow J, Jacobs IN. Postoperative recovery after microdebrider intracapsular or monopolar electrocautery tonsillectomy: a prospective, randomized, single-blinded study. Arch Otolaryngol Head Neck Surg. 2006;132(3):270-4.
11. Woloszko J, Gilbride C. Coblation technology: plasma meditation ablation for otolaryngology applications. Available at: https://ui.adsabs.harvard.edu/abs/2000SPIE.3907..306W/abstract. Accessed on 20 September 2020.
12. Warnock FF, Lander J. Pain progression, intensity and outcomes following tonsillectomy. Pain. 1998; 75(1):37-45.
13. Plant RL. Radiofrequency treatment of tonsillar hypertrophy. Laryngoscope. 2002;112(suppl 100): 20-2.
14. Belloso A, Chidambaram A, Morar P, Timms MS. Coblation tonsillectomy versus dissection tonsillectomy: postoperative hemorrhage. Laryngoscope. 2003;113(11):2010-3.
15. Burton MJ, Doree C. Coblation versus other surgical techniques for tonsillectomy. Cochrane Database Syst Rev. 2007;(3):CD004619.
16. Silveira H, Soares JS, Lima HA. Tonsillectomy: cold dissectionversus bipolar electrodissection. Int J Pediatr Otorhinolaryngol. 2003;67:345-51.
17. Adoga A. Cold versus hot dissection tonsillectomies: the Nigerian experience. ASEA. 2011;16: 64-8.
18. Mofatteh MR, Salehi F, Hosseini M, Hassanzadeh-Taheri M, Sharifzadeh G, Hassanzadeh-Taheri M. Comparison of postoperative morbidity between conventional cold dissection and bipolar electrocautery tonsillectomy: which technique is better?. Braz J Otorhinolaryngol. 2020;86(4):427-33.
19. Parker D, Howe L, Unsworth V, Hilliam R. A randomised controlled trial to compare postoperative pain in children undergoing tonsillectomy using cold steel dissection with bipolar haemostasis versus coblation technique. Clin Otolaryngol. 2009;34(3):225-31.
20. Hong SM, Cho JG, Chae SW, Lee HM, Woo JS. Coblation vs. Electrocautery Tonsillectomy: A Prospective Randomized Study Comparing Clinical Outcomes in Adolescents and Adults. Clin Exp Otorhinolaryngol. 2013;6(2):90-3.
21. Stoker KE, Don DM, Kang DR, Haupert MS, Magit A, Madgy DN. Pediatric total tonsillectomy using coblation compared to conventional electrosurgery: a prospective, controlled single-blind study. Otolaryngol Head Neck Surg. 2004;130(6):666-75.
22. Parsons SP, Cordes SR, Comer B. Comparison of post tonsillectomy pain using the ultrasonic scalpel,

coblator, and electrocautery. Otolaryngol Head Neck Surg. 2006;134(1):106-13.
23. Polites N, Joniau S, Wabnitz D, Fassina R, Smythe C, Varley P, et al. Postoperative pain following coblation tonsillectomy: randomized clinical trial. ANZ J Surg. 2006;76(4):226-9.

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