



OUTCOME OF ENDOSCOPIC COBLATION TONSILLECTOMY AND CONVENTIONAL DISSECTION TONSILLECTOMY IN THE MANAGEMENT OF TONSILAR HYPERTROPHY - A COMPARATIVE STUDY

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ABSTRACT

Background: Tonsillar hypertrophy is a normal physiological part of development in children, but in certain instances, it may lead to throat pain, oropharyngeal obstruction and various uncomfortable & distressing symptoms. These problems can be relieved by surgeries like tonsillectomy. This study focuses on comparing the outcomes of two different tonsillectomy techniques: the endoscopic coblation method and the conventional dissection approach. **Aim:** This study aims to evaluate and compare the efficacy and safety of endoscopic coblation tonsillectomy and conventional dissection tonsillectomy by assessing various parameters, including completeness of removal, intraoperative blood loss, surgical duration, postoperative pain, and recovery time. **Methods:** This prospective cross-sectional study involved 40 patients, aged 4 to 16 years, who visited the ENT outpatient department of Tripura Medical College with tonsillar hypertrophy between April 2023 and March 2024. The participants were evenly divided into two groups: the Coblation group and conventional dissection group with 20 patients in each. Data collected from the study were processed, analyzed, and presented using MS Office and SPSS version 23 software as required. **Results:** This study reveals that the coblation technique demonstrates superiority over the conventional method in several aspects, including reduced intra-operative blood loss (9.45 ± 2.65 ml), lower post-operative pain scores (2.95 ± 0.51), shorter recovery time (2.35 ± 0.49 days), and significantly enhanced completeness of tonsillar tissue removal. However, the coblation method is associated with a significantly longer surgical duration compared to the conventional approach. **Conclusion:** Endoscopic coblation tonsillectomy offers a more precise and patient-centered approach to treatment. Based on the study findings, while the coblation technique requires a longer operation time, its attractive benefits—such as reduced intraoperative blood loss, greater completeness of tissue removal, faster recovery, and lower postoperative pain—make it a preferred option for surgeons for tonsillectomy procedures.

KEYWORD: Tonsillar hypertrophy, Endoscopic coblation tonsillectomy, Conventional dissection tonsillectomy.

INTRODUCTION

Tonsillectomy is among the most frequently performed paediatric surgeries. Tonsils are more active from 4-10 years of age & its involution begins after puberty. But in certain cases the tonsils become so much enlarged and may lead to oropharyngeal obstruction, resulting in symptoms such as mouth breathing, altered voice quality, snoring, obstructive sleep apnoea, feeding challenges,

Facial deformities, recurrent upper respiratory tract infections, eustachian tube dysfunction, ear infections, and hearing loss, lastly systemic complications related to chronic tonsillitis.^[1,2] These conditions are common scenarios where tonsillectomy becomes a necessary surgical intervention. Tonsillectomy is often performed in conjunction with adenoidectomy when indicated;

Various techniques for tonsil removal are currently in practice amongst surgeons nowadays (e.g. blunt dissection, guillotine, bipolar diathermy haemostasis, bipolar diathermy scissors, laser endoscopic coblation method).^[3] An ideal tonsillectomy is characterized by minimal morbidity and mortality. The coblation technique has emerged as a method that delivers superior results, with fewer complications, reduced postoperative pain & morbidity, and lower recurrence rates.^[4 5 6 7] This study focuses on comparing the outcomes of the endoscopic coblation technique with the conventional dissection method in tonsillectomy procedures conducted at Tripura Medical College.

AIM

The objective of this study is to evaluate and compare

the safety and efficacy of two tonsillectomy techniques: the endoscopic coblation method and the conventional dissection method. The comparison is based on the following parameters:

- a) Duration of surgery,
- b) Intra-operative blood loss,
- c) Completeness of tissue removal,
- d) Post operative pain,
- e) Recovery time

MATERIALS AND METHODS

This prospective comparative study was conducted on 40 children (22 females and 18 males) aged between 4 and 16 years, who visited the ENT outpatient clinic at Tripura Medical College & Dr. BRAM Teaching Hospital, Hapania, between March 2023 and February 2024. Participants were randomly selected based on the presence of signs and symptoms of tonsillar hypertrophy causing oropharyngeal obstruction, necessitating surgical intervention for tonsil removal.

The criteria for selection are as follows:

Inclusion Criteria

1. Individuals aged between 4 and 16 years, diagnosed with tonsillar hypertrophy classified as grade III or IV.
2. Patients presenting symptoms associated with

tonsillar hypertrophy, such as dysphagia, mouth breathing, snoring, obstructive sleep apnea, or exhibiting features characteristic of chronic tonsillitis.

3. Patients with confirmed diagnosis of tonsillar hypertrophy through radiological imaging and/or findings from diagnostic videolaryngoscopy.

Exclusion Criteria

1. Patients under the age of 4 or over the age of 16.
2. Individuals with a history of prior tonsillar surgeries.
3. Patients diagnosed with any bleeding disorders.
4. Those with a cleft palate or a history of surgical repair for cleft palate.
5. Individuals presenting neuromuscular conditions or craniofacial abnormalities.
6. Patients with Down's syndrome.
7. Those identified with tonsillar hypertrophy classified as grade I or II.

Table 1: Brodsky clinical grading of tonsillar size.

Grade	Description
I	tonsils outside of the fossa and occupy $\leq 25\%$ of the oropharyngeal width
II	tonsils occupy 26-50% of the oropharyngeal width
III	tonsils occupy 51-75% of the oropharyngeal width
IV	tonsils occupy $> 75\%$ of the oropharyngeal width

***Grade 0 = tonsils in tonsillar fossa**

Preoperative assessment was done by the following:

1. History and clinical examination.
2. Radiological examination by x-ray soft tissue nasopharynx (lateral view) and diagnostic videolaryngoscopy.
3. Standard laboratory tests, including complete blood count (CBC), prothrombin time (PT), partial thromboplastin time (PTT), platelet count (PC), and international normalized ratio (INR).

Methods and measurement and outcome

40 patients (both sexes) with significant tonsillar hypertrophy (grades III and IV) were included in the study. They were randomly divided into two equal groups of 20 patients each: Group A underwent tonsillectomy via endoscopic coblation, and Group B underwent the conventional dissection method. Surgeons with similar qualifications and levels of surgical training participated in the study.

Group A: Endoscopic coblation method of tonsillectomy

A total of 20 patients, aged 4 to 16 years (mean age: 8.42 ± 3.67 years), underwent endoscopic coblation tonsillectomy using the MYRAC coblator device with a tonsillar coblation wand. The power settings were nine

for coblation and five for coagulation. The procedure was performed under general anesthesia and transoral 0-degree endoscopic guidance, with coblation conducted transorally.



Fig. 1: Pre-op image of tonsillar hypertrophy.

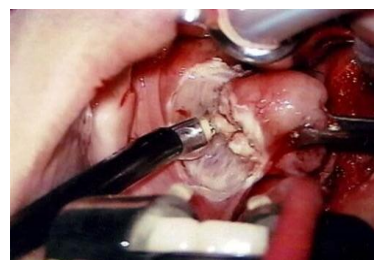


Fig. 2: Intra-op image of doing coblation.



Fig. 3: Immediate post-op image showing charring of the tonsillar soft tissue following tonsillar removal by coblation.

Group B: Conventional dissection method of tonsillectomy

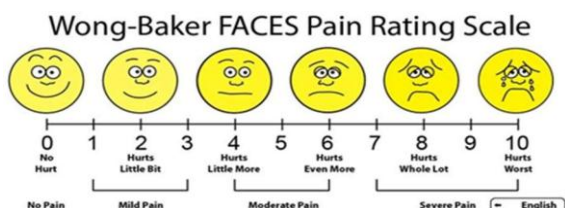
Twenty patients (aged 4–16 years, mean: 11.55 ± 3.68 years) underwent conventional dissection tonsillectomy under general anesthesia. Completeness of removal was confirmed via transoral 70-degree endoscope. Hemostasis was achieved with bipolar cautery.

Parameters of working

The intraoperative parameters studied were operative time, intraoperative bleeding.

Postoperative parameters included assessment of completeness of tonsillar removal, postoperative pain and the recovery time.

The **intraoperative time** was determined from the moment the anaesthetist transferred care of the patient, encompassing the setup of instruments, execution of surgical steps and ensuring complete haemostasis, until the patient was handed back to the anaesthetist. In conventional tonsillectomy, intraoperative bleeding was quantified by counting the number of two-square-inch gauze pads soaked in blood, with each gauze pad estimated to correspond to a blood loss of 5ml, along with the blood collected in the suction apparatus. For endoscopic coblation tonsillectomy, bleeding was assessed by measuring the total fluid in the suction apparatus, subtracting the volume of the irrigating solution. The **completeness of tonsil removal** was evaluated postoperatively through endoscopic examination to detect any residual lymphoid tissues. **Postoperative pain assessment** was conducted on the first day following surgery using the Visual Analogue Scale (VAS), specifically the Wong-Baker FACES Pain Rating Scale. Lastly, **recovery time** was determined based on the number of days the patient reported experiencing postoperative pain.



Statistical analysis

Data analysis was conducted using SPSS version 23. Quantitative data were presented as mean $\pm$ standard

deviation (SD), while qualitative data were represented as frequencies and percentages.

The following statistical tests were applied for comparative analysis:

1. The independent samples t-test was employed to compare the means of two groups.
2. The χ^2 test was utilized to evaluate the differences in proportions between two qualitative variables.

RESULTS

This study included 40 patients of both genders diagnosed with tonsillar hypertrophy. The participants were divided into two groups:

Group A: Comprised of 20 patients (11 males and 9 females), aged between 4 and 16 years, with a mean age of 8.42 ± 3.67 years. These patients underwent endoscopic coblation tonsillectomy.

Group B: Included 20 patients (7 males and 13 females), aged between 4 and 16 years, with a mean age of 11.55 ± 3.68 years. These patients underwent conventional dissection tonsillectomy.

Comparisons between the two groups were made on the basis of the following factors:

Operative time

The duration of surgeries for patients in Group A ranged from 15 to 30 minutes, with an average time of 21.55 ± 4.26 minutes. In contrast, for patients in Group B, the operation time varied between 5 and 15 minutes, with a mean duration of 9.45 ± 2.65 minutes.

Amount of blood loss

The average intraoperative blood loss in Group A was 10.50 ± 2.76 ml, with a range of 5 to 15 ml. In comparison, Group B exhibited blood loss ranging from 20 to 40 ml, with a mean value of 28.75 ± 6.46 ml.

Completeness of removal

Residual lymphoid tissue was evaluated through postoperative endoscopic assessment. The Brodsky scale of tonsillar hypertrophy grading was used to compare preoperative and postoperative findings, utilizing Diagnostic videolaryngoscopy. In this study, it was noted that Group A exhibited no residual tissue one month after surgery. Conversely, Group B had three cases where remnants of tonsillar tissue persisted one month postoperatively.

Post operative pain

Postoperative pain was documented on the first day following surgery. In Group A, two patients recorded a pain score of 4, fifteen patients had a pain score of 3, and three patients reported a score of 2, resulting in a mean pain score of 2.95 ± 0.51 . In comparison, Group B showed one patient with a pain score of 5, twelve patients with a score of 4, and seven patients with a score of 3, leading to a mean pain score of 3.70 ± 0.57 .

Recovery days

Children in Group A, who underwent coblation tonsillectomy, experienced notably fewer days of pain, analgesic usage, reliance on a liquid diet, and missed

school days. The mean recovery time for this group was calculated to be 2.35 ± 0.49 days. In contrast, Group B, which underwent conventional dissection, had a longer mean resolution period of 4.10 ± 0.55 days.

Table 2: Comparisons of outcomes between Coblation tonsillectomy vs. Conventional dissection tonsillectomy.

Parameters	Coblation (Group A) N = 20	Conventional (Group B) N = 20
Operation duration (Minutes)	Mean $\pm$ SD 21.55 ± 4.26	Mean $\pm$ SD 9.45 ± 2.65
Intraoperative bleeding (ml)	Mean $\pm$ SD 10.50 ± 2.76	Mean $\pm$ SD 28.75 ± 6.46
Completeness of removal (n %)	100%	85%
Postoperative pain (VAS score)	Mean $\pm$ SD 2.95 ± 0.51	Mean $\pm$ SD 3.70 ± 0.57
Recovery days	Mean $\pm$ SD 2.35 ± 0.48	Mean $\pm$ SD 4.10 ± 0.55

DISCUSSION

The findings of the current study revealed that coblation tonsillectomy required a longer operation time compared to conventional dissection tonsillectomy. However, the coblation method resulted in significantly less blood loss than the conventional approach. The difference in operation duration between the two techniques was found to be highly statistically significant.

Similarly, the disparity in intraoperative blood loss between these methods was also highly statistically significant.

This study demonstrated that coblation tonsillectomy resulted in the complete removal of tonsillar tissue, with no residual tissue observed postoperatively. In contrast, 15% of cases involving conventional dissection tonsillectomy showed residual tonsillar tissue one month after surgery.

This study revealed that the coblation technique resulted in reduced postoperative pain, with patients resuming their normal diet and activities sooner compared to the conventional method. Additionally, Venu Divi et al conducted a comparison of endoscopic-assisted tonsillectomy and dissection tonsillectomy among 1762 patients. Their findings indicated that endoscopic tonsillectomy was more effective than dissection tonsillectomy in achieving complete removal of tonsillar tissue.^[8] Nastasha Polites et al conducted a study involving 19 patients diagnosed with tonsillar hypertrophy. The findings indicated that coblation tonsillectomy yielded superior outcomes, including complete removal of tonsillar tissue, reduced blood loss, and lower grades of postoperative pain compared to conventional tonsillectomy.^[9] Another study by Ida Amir et al produced similar findings, highlighting that endoscopic coblation tonsillectomy was more efficient than conventional dissection tonsillectomy in terms of intraoperative blood loss and postoperative pain experienced on the postoperative days.^[10]

The results demonstrated that coblation tonsillectomy was superior to the conventional technique, offering reduced intraoperative bleeding, enhanced safety, greater precision in tonsil removal, and minimized injury to surrounding tissues. A study by M S Timms et al. yielded similar findings, demonstrating that coblation tonsillectomy resulted in reduced intraoperative blood loss, a shorter duration of postoperative discomfort, a lower risk of injury to adjacent tissues, and enhanced precision in tonsil removal.^[11] Antonio Belloso et al conducted a study involving patients with tonsillar hypertrophy, which also demonstrated that coblation tonsillectomy is a safe and effective procedure compared to conventional dissection method.^[12] The results demonstrated that the new technique using tissue coblation for tonsil dissection offers significant advantages in the postoperative period compared to conventional dissection tonsillectomy.

CONCLUSION

While endoscopic-assisted coblation tonsillectomy requires a longer operative time, it ensures precise, complete, and safe removal of tonsillar tissue. Additionally, it has been observed to result in reduced intraoperative bleeding with improved haemorrhage control. Patients undergoing this technique experience less postoperative pain and faster recovery. In contrast, conventional tonsillectomy has a shorter operative duration but is associated with higher intraoperative bleeding, incomplete removal of tonsillar tissue, increased postoperative pain, and delayed healing. However, the primary drawback of the coblation method is its high cost, along with the need for properly trained personnel to perform the procedure. Therefore, despite its numerous advantages, coblation tonsillectomy cannot be routinely implemented for all patients unless cost-related challenges are addressed and adequate personnel training is ensured.

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