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Comparison of the Outcome of Coblation Tonsillectomy versus Cold Dissection Tonsillectomy

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ABSTRACT:

Objectives: To compare the outcome of coblation tonsillectomy versus cold dissection tonsillectomy.

Study design & settings: Randomized controlled trial from 26th September 2025 to 25th December 2025 at ENT Department at Sheikh Zayed Hospital, Lahore.

Methodology: All patients with chronic tonsillitis of duration >3 months, age 20 to 60 years of either gender were included. Tonsillar cancer, known bleeding disorders (INR >1.5), and a history of peritonsillar abscess were excluded. Patients in a group Group B's tonsils are removed via cold dissection, while group A's tonsils are removed by coblation. Seven days following the operation, the mean post-operative pain was assessed. There were additional reports of initial bleeding, secondary bleeding, and secondary infection. The postoperative discomfort in both groups was compared using the independent "t" test, and the primary, reactionary, and secondary hemorrhages were compared using the chi square test; a p-value of =0.05 was deemed significant.

Results: In this study, mean intra-operative blood loss in Group A (coblation tonsillectomy) was 28.90 ± 7.78 ml while in Group B (cold dissection tonsillectomy) was 42.07 ± 4.77 ml (p-value = 0.0001). Mean post-operative pain in Group A was 2.20 ± 0.89 while in Group B was 4.87 ± 1.14 (p-value = 0.0001). Secondary hemorrhage was found in 3.33% patients in the cold dissection group and 0.0% in the coblation group.

Conclusion: Coblation tonsillectomy offers benefits such decreased intraoperative blood loss, shorter surgery time, and quicker return to a normal diet.

Keywords: Coblation, tonsillectomy, post-operative pain, blood loss, hemorrhage

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INTRODUCTION:

The tonsils are a component of the Waldayer's ring, an assembly of lymphoid tissue found in the oropharynx and nasopharynx at the aerodigestive tract's entry. It has a significant impact on children's immunology and defense mechanisms, antibody secretion, and most notably, secretory Ig A synthesis, which is crucial for the mucosal defense mechanism. Their defense system occasionally malfunctions and becomes the source of infection, resulting in recurring sore throats, fevers, and other problems for no apparent reason. This necessitates tonsillectomy, or the removal of the diseased tonsils.[1]

In 30 BC, Celsus was the first to describe tonsil removal. Since that time, numerous techniques of surgery and improved instruments have been created with this purpose.[2] The process should ideally be quick, painless, and bloodless. However, in practice, there are risks associated with every tonsillectomy technique. Even though tonsillectomy is the most common and straightforward surgery, the surgeon is constantly concerned about the high risk of complications, such as intraoperative and postoperative hemorrhage, which can cause shock and occasionally even death.[3]

The two most common postoperative outcomes after

tonsillectomy are discomfort and bleeding. The guillotine operation, cold dissection, electrocautery, harmonic scalpel, coblation, and laser surgery are only a few of the additional methods described in the literature.[3] One of the most traditional and tried-and-true methods is the traditional cold dissection method with metal tools. This leaves an open wound that can be healed by secondary intention. Initially employed for arthroscopic procedures, the coblation method is a relatively recent technique. In 1998, a new technique for tonsillectomy was introduced: radiofrequency-based dissection in the plasma field.[4] Coblation tonsillectomy was initially suggested as an efficient and safer method of tonsil removal in 2001. This technique ablates tissue at relatively low temperatures (4070 to C) by producing a plasma field at the surface of the probe. This is in contrast to diathermic coagulation which causes temperatures extending to 500 o C, this plasma field consisting of highly ionized particles examines and separates the molecular bonds of restricted tissue, significantly reducing heat loss to adjacent tissues. Radiofrequency generator may also be used to perform coagulation in order to attain hemostasis.[5,6]

Concerning the different surgical procedures, the more critical issues when it comes to defining which modality is the best to use in this treatment are augmenting intra-operative effectiveness, and reducing post-operative morbidity. Pain and bleeding, which expose the wound to secondary intention healing, are two of the main postoperative problems associated with cold steel dissection tonsillectomy.[4,5] The quality of life following tonsillectomy can be assessed by tracking complications (hemorrhage), tonsillar fossa healing, postoperative pain, and return to a normal diet. The coblator reduces blood loss, shortens the time required for surgery, and lessens the possibility of damage to adjacent tissues like the uvula, posterior pillar, and anterior pillar.[6] Studies have demonstrated that the coblation strategy is better than conventional methods, however the results are often inconsistent. Coblation is associated with an earlier return to normal activity, despite the increased risk of recurrent bleeding.[7]

According to one study[8], patients treated with coblation tonsillectomy had an average operating time of 20.2 minutes, SD = 4.7, while those treated with traditional cold dissection tonsillectomy had an average operating time of 31.2 minutes, SD = 4.3. According to a similar study, the cold dissection group experienced higher mean post-operative pain after 7 days (1.84 ± 0.85) than the coblation group (1.24 ± 0.77).[8] There was secondary hemorrhage in 3.26% patients in the cold dissection group and 0.0% in the coblation group.[9]

I've decided to compare the outcomes of coblation and cold dissection tonsillectomy in the local community because there isn't much information available. In addition to adding significantly to the corpus of current literature, my study included local information.

METHODOLOGY:

After approval from institutional ethical review committee (Ref no. 02-TERC/NHRC-SZH/INT-SC/768 dated 26-6-2025), the ENT Department at Sheikh Zayed Hospital, Lahore conducted this Randomized controlled trial (ClinicalTrials.gov Identifier: NCT07488858) from 26th September 2025 to 25th December 2025. The WHO calculator was used to figure out the sample size for two population means. With a 95% confidence level, 80% research power, and a mean pain score in cold dissection as 1.84 ± 0.85 and coblation as 1.24 ± 0.77, the sample size of 60 cases—30 in each group—was set.[8]

All patients with chronic tonsillitis (Clinical examination of recurrent tonsillitis with four acute tonsillitis attacks in a year revealed a high grade fever (>101 F), red, swollen tonsils and anterior pillars, and a palpably sore jugulodigastric lymph node in each attack (at least three attacks in a year)) of duration >3 months, age 20 to 60 years of either gender were included. H/o peritonsillar abscess, known bleeding disorder (INR >1.5) and tonsillar malignancy were not included.

Every patient was asked for their informed permission. Demographic information (age, gender, and length of illness) were then taken. Each selected case was selected by lottery into either group A or B. In group A, the tonsils are removed using coblation and on group B, the tonsils are removed using cold dissection. Through the assistance of the researcher, all procedures have been performed by one surgical team.

General anesthesia was used for the procedure, and either nasal or oral endotracheal intubation was used. A appropriate Boyle Davis mouth gag with tongue blade was used to open the mouth while the head was positioned in Rose's position. Draffin's bipod, which is stabilized by the Maguran plate, then stabilizes the mouth. Tonsils are held in place with Dennis Brown tonsil retaining forceps. With this approach, a scissor was used to make an incision just medial to the anterior pillar. Once the capsule was identified, Gwynne-Evans's dissector was utilized to perform the dissection. In this plain, dissection was carried out until the lower pole was reached. Negus artery forceps crushed the lower pole, and then scissors severed the tonsil. Next, a Negus knot tier was used to press an outer knot made of No. 1 silk inside. The suture is severed after the knot below the lower end of the double-curved artery forceps is tightened, the Negus forceps are removed, and another knot is made. Lastly, a Mollisons anterior pillar retractor was used to examine the fossa and look for any bleeding. If a bleeder point was discovered, bipolar diathermy is used to either ligate or cauterize it. For the other site, the identical procedures are done. Both procedures require the same postoperative care and drugs. To prevent edema from forming, the patient's head was elevated above the level of the heart in the ward by resting it on a cushion. The jugulodigastric area can be

covered with ice packs wrapped in gauze. The patient can start taking cold beverages and ice cream on day 0. Patients are advised to begin eating semi-liquid foods on day one. A few days following surgery, antibiotics were recommended.

Following the device's setup, we employ an EVAC70 T&A (ArthroCare ENT, Sunnyvale, CA), which is configured to have an irrigation system linked. To determine the precise plane of dissection between the tonsillar capsule and its bed, we made an incision in the anterior pillar at the level of the tonsil's higher pole. From upper to lower pole, we start the process. To preserve the dissection in the interim, we alter how the tonsil is handled. Coagulation mode is used to control any bleeding. To enable the plasma field that is created at the wand's tip to work, we gently move the wand as if we were holding a pencil while maintaining a very little gap between the wand's tip and the tissue. Until the lower pole is located and separated, the process is repeated. For added security, the lower pole may be ligated in adults.

All patients received the same anesthesia and recovery room procedures. Mean post-operative pain was measured using a visual analoque scale 7 days after the procedure, with 0 representing no pain and 10 representing the severe pain. Secondary infection: presence of purulent discharge (thick and milky discharge from a wound) and resulting in opening of the skin wound within 2 weeks after operation. Primary hemorrhage: Bleeding during tonsillectomy procedure. It was quantified in milliliter (ml). Reactionary hemorrhage: Bleeding within 24 hours of tonsillectomy. Its occurrence was noted only. Secondary hemorrhage: Bleeding occurring between 24hrs – 2 weeks after tonsillectomy. Its occurrence was noted only. Pre-designed Performa will be used to gather the data.

The data was entered and analyzed using SPSS version 25.0. For age, length of sickness, and postoperative pain score, the mean and SD were shown. Gender, housing location (rural versus urban), hemorrhage, frequency and percentage were all shown. The postoperative pain was compared by independent t test and the chi square test of the hemorrhage; a p-value of =0.05 was considered significant. Age, gender, duration of sickness, and place of residence (rural vs. urban) were the factors used for stratification. The independent t-test was used following stratification, and a p-value of =0.05 was deemed significant.

Table-1: Distribution of different variables (n=60)

		Group A (n=30)	Group B (n=30)
		Number (%)	Number (%)
Age (years)	20-40	26 (86.67%)	25 (83.33%)
	41-60	04 (13.33%)	05 (16.67%)
Gender	Male	18 (60.0%)	19 (63.33%)
	Female	12 (40.0%)	11 (36.67%)
Duration of disease (months)	<6	11 (36.67%)	12 (40.0%)
	>6	19 (63.33%)	18 (60.0%)
Residence	Rural	11 (36.67%)	09 (30.0%)
	Urban	19 (63.33%)	21 (70.0%)

RESULTS:

Age was 31.90 ± 7.86 years on average. Patients in groups A and B had mean ages of 32.07 ± 7.92 and 31.73 ± 8.61 years, respectively. According to Table 1, the majority of the 51 patients (85.0%) were in the 20–40 age range. With a male to female ratio of 1.6:1, 37 (61.67%) of the 60 patients were men and 23 (38.33%) were women. Group A's mean illness duration was 7.50 ± 2.36 months, whereas group B's was 7.23 ± 2.21 months. Table 2 displays the distribution of several variables.

In this study, mean operative time in group A (coblation tonsillectomy) was 21.92 ± 6.83 minutes and in group B (cold dissection tonsillectomy) was 30.29 ± 8.67 minutes. Mean intra-operative blood loss in Group A (coblation tonsillectomy) was 28.90 ± 7.78 ml while in Group B (cold dissection tonsillectomy) was 42.07 ± 4.77 ml (p-value = 0.0001). Mean post-operative pain in Group A (coblation tonsillectomy) was 2.20 ± 0.89 while in Group B (cold dissection tonsillectomy) was 4.87 ± 1.14 (p-value = 0.0001) as shown in Table 2. There was no primary infection and reactionary hemorrhage in both groups. Secondary hemorrhage was found in 3.33% patients in the cold dissection group and 0.0% in the coblation group.

Stratification of intra-operative blood loss and post-operative pain with respect to effect modifiers is shown in Table 3 & 4 respectively.

DISCUSSION:

Even though tonsillectomy is a frequent procedure carried out by otolaryngologists, there are still hazards associated with it, including bleeding and post-operative pain.[10,11] To determine the best tonsillectomy procedure in terms of

Table-2: Comparison of outcome between both groups

Outcome	Group A (n=30)	Group B (n=30)	p-value
	Mean ± SD	Mean ± SD	
Operative time (min)	21.92 ± 6.83	30.29 ± 8.67	0.0001
Intra-operative blood loss (ml)	28.90 ± 7.78	42.07 ± 4.77	0.0001
Post-operative pain	2.20 ± 0.89	4.87 ± 1.14	0.0001

Table 3: Stratification of intra-operative blood loss with respect to effect modifiers

		Group A (n=30)	Group B (n=30)	P-value
		Blood loss (ml)	Blood loss (ml)	
		Mean ± SD	Mean ± SD	
Age (years)	20-40	28.81 ± 7.73	41.36 ± 5.91	**0.0001**
	41-60	29.50 ± 9.33	45.60 ± 8.68	
Gender	Male	28.94 ± 7.73	41.63 ± 5.53	
	Female	28.83 ± 8.20	42.82 ± 8.08	
Duration of disease (months)	=6	31.73 ± 5.59	39.83 ± 5.64	
	>6	27.26 ± 8.52	43.56 ± 6.71	
Residence	Rural	31.82 ± 7.08	39.0 ± 5.39	
	Urban	27.21 ± 7.84	43.38 ± 6.56	

Table 4: Stratification of postoperative pain with respect to effect modifiers

		Group A (n=30)	**Group B (n=30)**	**P-value**
		VAS score	**VAS score**	
		Mean ± SD	Mean ± SD	
Age (years)	20-40	2.15 ± 0.92	4.88 ± 1.20	**0.0001**
	41-60	2.50 ± 0.58	4.80 ± 0.84	
Gender	Male	2.28 ± 0.75	5.11 ± 1.05	
	Female	2.08 ± 1.08	4.45 ± 1.21	
Duration of disease (months)	=6	1.73 ± 0.65	5.25 ± 0.97	
	>6	2.47 ± 0.90	4.61 ± 1.20	
Residence	Rural	1.64 ± 0.81	4.89 ± 1.27	
	Urban	2.53 ± 0.77	4.86 ± 1.11	

cutting down on surgery time, limiting blood loss, and avoiding problems like discomfort and postsurgical hemorrhage, surgeons continuously evaluate different approaches. The purpose of this study was to compare tonsillectomy by coblation with the conventional dissection method in adult patients.

According to the current study, the mean duration of coblation tonsillectomy was much lower than that of cold dissection tonsillectomy. This result implies that lower intraoperative periods may be linked to coblation-assisted tonsillectomy, which could result in shorter surgical times and less anesthetic exposure. This result demonstrates a possible efficiency benefit of coblation-assisted tonsillectomies, which could help patients and surgical teams by cutting down on anesthetic duration and total surgical process time. In contrast to coblation-assisted instances, which required 4.2 minutes, the conventional approach required 7.2 minutes for the operation, according to Zainon et al.'s report.[12] The coblation-assisted tonsillectomy took 15 minutes to perform, while the usual procedure only took 11 minutes, according to a research by Rakesh et al.[13] In their investigation, Pachar K et al. came to the conclusion that the intraoperative times for the two procedures did not differ significantly.[14] When compared to other research, some concluded that the coblation-assisted method required surgical competence and took longer, while others found that the procedure's mean time was shorter.

According to the current study, compared to cold dissection tonsillectomy, coblation tonsillectomy showed a much decreased mean blood loss during the process. This result implies that, in comparison to traditional tonsillectomy, coblation-assisted tonsillectomy might result in less intraoperative hemorrhage. Specifically, the mean intra-operative blood loss in Group A (coblation tonsillectomy) was 28.90 ± 7.78 ml while in Group B (cold dissection tonsillectomy) was 42.07 ± 4.77 ml (p-value = 0.0001). This finding suggests that coblation-assisted tonsillectomy may help reduce intraoperative bleeding, which could improve surgical outcomes, cut down on hemostasis operating times, and hasten patient recovery. In their study, Nallasivam et al. found that patients who had tonsillectomy using the traditional technique lost more blood on average (43.4 ml) than those who had tonsillectomy with coblation assistance (18.7 ml).[15]

According to the results, patients who had coblation had consistently lower pain scores at all time periods and needed fewer analgesic doses during the first week following surgery. These results imply that, in comparison to the conventional method, coblation offers a more delicate surgical approach, leading to better patient comfort and a quicker recovery.

The current study's findings are consistent with a number of earlier studies that emphasized the benefits of coblation in lowering postoperative morbidity. Several studies have demonstrated that coblation is linked to fewer pain episodes, an earlier oral feeding resume, and a decreased requirement for medication. Goyal A et al[16] explained the positive effects of coblation by describing it as a technique that restricts heat injury to surrounding tissue. In a similar vein, individuals receiving coblation reported far lower pain levels than those having cold dissection, according to Muddaiah D et al.[17] However, not every study cites the same advantages. Due to variations in study populations, sample sizes, or the operating surgeon's experience, some researchers have not found statistically significant differences between the two methods. Coblation-assisted tonsillectomy patients had significantly greater postoperative pain assessments. According to Lavania A et al.'s research, patients undergoing coblation-assisted tonsillectomy used fewer analgesics, experienced less discomfort, and resumed their regular eating and activities faster than those undergoing dissection tonsillectomy.[18] In their investigation, Jat et al. also found that patients who had tonsillectomy using the traditional technique experienced much more postoperative pain.[19]

The current study indicates that there was no primary infection and reactionary hemorrhage in both groups. Secondary hemorrhage was found in 3.33% patients in the cold dissection group and 0.0% in the coblation group. Only one patient had a secondary hemorrhage on the right side on the seventh day, which resulted in delayed healing, according to a research by Karathia et al.[20]

In the same study, Mostafa et al. identified a reduced primary tonsillectomy hemorrhage rate compared to the dissection method and higher rate of secondary tonsillectomy hemorrhage (60 patients). The time to resume the normal activity (which was determined by resuming job activities) as well as the average time to resume normal diet was significantly less in the coblation group.[21]

In their prospective investigation, Muthubabu et al. came to the following conclusions: coblation is a rather simple procedure that produces a bloodless field with little tissue injury. Compared to the dissection approach, the coblation process needed more operating time. Neither higher intraoperative blood loss nor increased postoperative pain were brought on by the lengthier duration. Compared to the dissection and snare approaches, the coblation method resulted in a much lower intraoperative blood loss. The coblation approach helped the patient return to regular activities sooner since the postoperative pain scores were much reduced.[22] A meta-analysis also found that the coblation approach produced improved perioperative results.[23] Coblation is chosen over traditional methods since it allows for a quicker return to normal even at work.[24]

According to a different study[25], it took an average of 42.9 minutes for the dissection approach and 34 minutes for the coblation technique to achieve full hemostasis after making an incision. On average, 51.8 ml of blood was lost using the dissection approach, while 22.3 ml was lost using the coblation technique. It was determined that this difference was statistically significant. A visual analog scale was used to assess pain. After statistical analysis of the data collected from the two groups, the independent t-test was used to determine the "p" value. Over a ten-day period, the average pain score for the coblation technique was 2.72, while the average pain score for the dissection approach was 4.84.[25]

Notwithstanding the encouraging outcomes, it is important to recognize some of this study's shortcomings. Despite using a Visual Analog Scale, pain evaluation is intrinsically subjective and impacted by personal tolerance. Furthermore, the study was restricted to a single institution and had a small sample size, which limits how broadly the results may be applied. Multicenter, prospective randomized controlled trials with greater sample sizes should be a part of future research in order to assess a wider variety of clinical outcomes and give more robust data.

Limitations: Possible limitations to this Study are sample size, patient drop outs and the duration of the study. The Study has its limitation in the number of participants (n=60); it might be insufficient to identify the relatively uncommon hemorrhage complication and pain after tonsillectomy. Additionally, the patients who drop out may also affect the outcome and result in an overestimation of the risk of a particular treatment compared to the other. Finally, the study will be restricted to two weeks after operation. Follow-up would be a long term study that would enable investigations of long term results of the two techniques.

CONCLUSION:

In summary, the results show that, in comparison to traditional tonsillectomy, coblation tonsillectomy offers benefits such decreased intraoperative blood loss, shorter surgery time, and quicker return to a normal diet. The research highlights the potential advantages of coblation tonsillectomy in improving patient outcomes and accelerating recovery, even though traditional techniques may be favored for treating postoperative pain. However, when choosing the best tonsillectomy technique, it is essential to consider unique patient characteristics and surgical preferences. Even though coblation tonsillectomy has benefits including less intraoperative blood loss and quicker recovery, it's important to carefully weigh aspects like cost-effectiveness, surgeon experience, and patient-specific considerations.

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Authors Contribution:
Aqsa Yaqub: Conception and Design, acquisition of data, analysis and interpretation of data, drafting and critical revision, final approval of the version to be published
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Sarfraz Latif: Conception, acquisition of data, critical revision of the manuscript
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