Electrocautery versus cold steel tonsillectomy comparison study

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ABSTRACT

Objective: the objective of this study was to compare the intraoperative blood loss, intraoperative time**,** postoperative pain and secondary hemorrhage between electrodissection and cold steel dissection tonsillectomy.

Methods: One hundred and six patients were enrolled in this study, the patients were randomly allocated into electrodissection group A (n=51) and cold steel dissection tonsillectomy group B (n=53). All patients are above 7 years and had history of recurrent tonsillitis and/or tonsillar hypertrophy with obstructive symptoms. Intraoperative parameters and postoperative outcome were assessed.

Results: In group A patients had statically significant less operative time and blood loss than group B early postoperative pain was not differ significantly between the two groups, however late onset pain (pain on the 7th day) was significantly higher in group A. There was no significant difference between the groups regarding secondary hemorrhage.

Conclusion: Electrodissection tonsillectomy is rapid, safe and effective method of tonsillectomy with obvious advantage of minimum perioperative blood loss, lower operative time and without early post-operative pain difference when compared to cold steel dissection tonsillectomy. Although it has some disadvantage of late postoperative pain.

Keyword: electrodissection, cold steel dissection tonsillectomy.

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INTRODUCTION

Since the first removal of tonsils was performed by Celsus in 30 BC, multiple surgical technique and variety of instruments have evolved (in addition to cold steel technique): electrocauterization, lazer dissection, cryosurgery, bipolar dissection scissors, cablation assisted tonsillectomy and ultrasonic scalpel tonsillectomy [(1).] During recent decade, electrodissection tonsillectomy has been used most widely compared to other surgical methods based on the intraoperative blood loss and shorter operative time [(2)]. Since 1980 electrocautery had become the instrument of choice for tonsillectomy due to its familiarity to surgeons, ease of use, and limited intraoperative blood loss. According to latest survey of members of the American Academy of otolaryngology and the American Society of pediatric otolaryngology, electrocautery is the preferred method of tonsillectomy by 55% otolaryngologist, coblation tonsillectomy by 20% to 25%, cold steel technique by 10% and other technique including microdebrider partial tonsillectomy in about 10% [(3)].

Electrocautry tonsillectomy with a monopolar blade allows minimal blood loss and a short operating time because simultaneous bleeding control and tissue dissection are possible. However, it is reported to cause relatively more severe post-operative pain and delayed wound healing than conventional cold steel tonsillectomy. These complications are due to the thermal tissue damage caused by temperature that reach 300°C. This study was undertaken in an attempt to compare the electrocautry and cold steel dissection in tonsillectomy. Details about post-operative pain, secondary hemorrhage, peri-operative blood loss, and operative time were sought.

METHODS

In our study 120 patients underwent tonsillectomies (16 of them lost on follow up and excluded from the study) so only 104 patients were included in our study. Fifty one of the patients had electrocautry (monopolar) tonsillectomy (group A) and 53 had cold steel dissection tonsillectomy (group B).

Indication for tonsillectomy in this study included history of recurrent tonsillitis and tonsillar hypertrophy with obstructive symptoms. Patients who were less than 7 years old, with known bleeding disorder or unilateral tonsillar hypertrophy were excluded. The age of 7 was chosen in view of the ability of the patient to cooperate in the study.

In this study patients did not know which mode of tonsillectomy to be done. Operations were done by single surgeon using a standard technique of cold dissection and electocautery tonsillectomy. Operation times were measured in minutes from the first incision to the completion of hemostasis of the tonsillar bed. Blood loss was estimated, before start of surgery gauze were weighed and sterilized suction bottle was cleaned and emptied. Only measured amount of saline were kept for intermittent suction to prevent blockage. If there was concurrent adenoidectomy blood estimated and deduced from the total blood in the bottle.

In group A there was immediate coagulation of bleeders by electrocautery, in group B hemostasis was mainly achieved by ligation and local pressure. All the soiled and unused gauzes are weighed. The difference in weight is the weight of blood lost in gauze. This was converted into milliliters by dividing the weight by specific gravity which is 1.055.

Pain was assessed post-operatively by using a 10 points Visual Analogue Score VAS (1=no pain and 10=severe pain). All patients and children were shown the VAS preoperatively and its use is explained. Pain recorded at 6, 12, 24 hrs after extubation.

Postoperatively patient were given paracetamol 65 mg/kg and Co Amoxiclav 50 mg /kg in three divided doses. Additional requirement of analgesia was also recorded. All patients were reassessed on the 7^{th} and 14^{th} postoperative day for pain score and incidence of secondary hemorrhage.

All patients and parents were informed regarding the procedure with written consent. All data were analyzed using SPSS version 18.0.

RESULT

Fifty eight female and 46 male were enrolled in the study. The age ranges from 7-38 years. There was no significant difference between the 2 groups regarding the age and gender.. Both groups were compared for perioperative bleeding, operative time, pain scores and incidence of secondary hemorrhage. Both operative time and blood loss during operations were significantly lower in group A as compared to group B.

Average operative time in group A was 14.50 minutes while it was 25.40 minutes in group B *(P* value <0.05). Amount of blood loss was also significantly lower in group A 14.20 ml as compared to group B 30.7 ml table(1).

Table (1). The amount of blood loss and operative times in the two groups.

	Electrocautry	Cold Steel Dissection	*P* - value
Bleeding (ml)	14.20	30.70	< 0.05
Time (mins)	14.50	25.40	<0.05

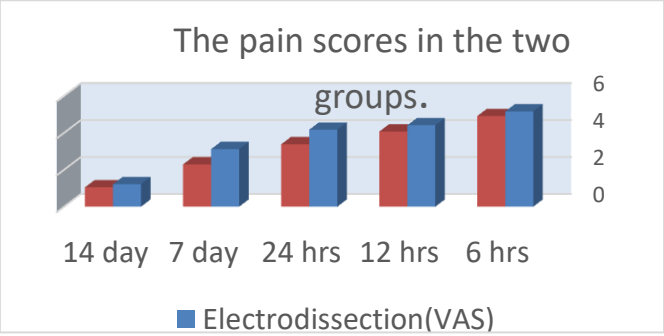
One patient in group A (2%), and 1 patient in group B (1.8%) had secondary hemorrhage, which is statically not significant between the 2 groups. Secondary hemorrhage is defined as any bleeding occurring after 24 hours of surgery.

There was no statically significant difference as far as early pain score (pain within 24 hours) were concerned between the 2 groups. However patients in group A had significant higher pain score than group B on the 7^{th} day, while in the 14^{th} days there is also no significant difference between the 2 groups regarding pain scores, table(2).

Table (2). The pain scores in the two groups.

Postoperative Time	Electrodissection (VAS)*	Cold Steel Dissection(VAS)	*P*-value
6 hrs	5.16	4.91	0.089
12 hrs	4.41	4.07	0.086
24 hrs	4.17	3.38	0.062
7 day	3.12	2.29	0.001
14 day	1.22	1.05	0.704

*VAS= Visual Analogue Score



DISCUSSION

Tonsillectomy is one of the most common surgical procedures performed worldwide. In case of recurrent acute tonsillitis it has been reported that watchful waiting results in higher cost compared to tonsillectomy [(5)] . Many surgical techniques have been described for removal of the tonsils. Evidence suggest that sharp dissection may lead slightly less postoperative pain. However there may be less intraoperative blood loss with electocautery technique. Monopolar electrocautery has become the most popular technique of tonsil dissection in the past two to three decades, because it offers great hemostasis during the dissection [(6)] .

The choice of technique often comes down to the surgeon's perceived benefits with regard to less intraoperative and post-operative bleeding, duration of the procedure and minimum pain in the post-operative period [(7)] .

Idea of our study was to compare the efficacy of electrodissection tonsillectomy with conventional cold steel dissection tonsillectomy. There are few studies specifically designed to compare the rate of hemorrhage in electrocautry and cold' dissection tonsillectomy.

In our study the average perioperative blood loss was 14.2 ml in electrocautry group where it was 30.7 ml in cold dissection group with *p* value of 0.001. These results were also reproduced in studies carried out by Ahmed et al and Pung et al who reported intraoperative blood loss of 10 ml and 4 ml in cold dissection and electrocautry method respectively, so it is clear that electrocautry is better than cold steel dissection regarding the intraoperative blood loss [(8)(9)] .

The operative time in our study in the electrocautry group the average was 14.50 minutes while in cold steel group the average operative time was 25.40 minutes with statically significant difference in favor of electrocautry group. The same result were found in studies carried out by Bercin et al and Ahmed et al [(9)(10)] . In electrocautry group there is less time because of immediate coagulation as compared to cold steel dissection method where more time was consumed first in packing of tonsillar fossa and ligation of bleeding vessels.

Regarding the postoperative pain, Nunez et al reported that pain is the main reason for seeking out patients' medical attention in the first 2 weeks after tonsillectomy [(11)] . In our study we found that postoperative pain in electrocautry group is more than cold steel group, but it is statically significant only in 7th postoperative day. The same result was found in the study done by Robert et al who did systemic review of literatures' comparing cold versus hot tonsillectomy [(12)] .

The main reason for this difference in pain score is because of more thermal damage caused during electrodissection. Tays reported in his study in tonsillectomy for adult patients there is significantly less pharyngeal pain on the electrodissection side in the first postoperative day [(4)]

The incidence of secondary bleeding in our study was (2%, 1 patient) and (1.8%, 1 patient) in electrocautry group and cold steel group respectively which is statically not significant (p >0.05). While in study of Gendy et al the secondary bleeding was higher in electrocautry group 2.3% (12 patients) compared to 1% (6 patients) of the cold steel group, they claimed that late onset pain and delayed return to normal diet in patients of electrocautry group result in higher incidence of secondary bleeding [(13)] , we think that this difference secondary bleeding from our study is due to small sample in our study .

CONCLUSION

Electodissection tonsillectomy does have an advantage in improving intraoperative efficiency in term of intraoperative time and bleeding compared to cold steel dissection tonsillectomy. Although it has the disadvantage of late postoperative pain, it can be used in heavy operative waiting cases and in children with less blood reservoir.

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