Haemostasis During Tonsillectomy Silk Ligation Versus Bipolar Diathermy

Adel Sahib Al Habib Shhaib Ahmed

College of Medicine, University of Kufa, Iraq.

Abstract

Background: Tonsillectomy is a commonly performed surgical procedure. there are several operative methods but the superiority of one over the other has not been clearly demonstrated

Design: prospective, comparative study.

Aim: To compare the morbidity associated with tonsillectomy using two different technique s for haemostasis silk ligation versus diathermy.

Patients and Methods: This is a prospective, comparative study at ENT department of AL –sadder teaching hospital, College of Medicine, University of Kufa , from June 2008 – November 2009; where 250 patients were enrolled in this study. The results of the two groups i.e. tonsillectomy using silk ligation or diathermy for haemostasis was studied.

Results: Tonsillectomy of 250 patients were performed ; 160 male (64%) and 90 (36%) female .the mean operation time was 20 minutes with bipolar diathermy as compared to 30 minutes with silk ligation ,analgesic requirement during the first 24 hours post operatively was equal with both techniques .

Primary bleeding was noticed in 6 patients (2.4%) with bipolar diathermy haemostasis as compared to 13 patients (5.2%) with silk ligation .Secondary bleeding was encountered in 10 patients (4%) with bipolar diathermy and in 7 patients (2.9%) with silk ligation

Conclusions: Less operative time was taken by bipolar diathermy as compared to silk ligation. The incidence of primary post-operative bleeding was more with silk ligation while the secondary haemorrhage was significantly less with silk ligation.

إيقاف النزف خلال عملية استئصال اللوزتين دراسة مقارنة بين طريقتي العقد الجراحية والكي الكهربائي ثنائي القطب

الخلاصة

تعد عملية استئصال اللوزتين من أكثر العمليات شيوعا في اختصاص الأنف والأذن والحنجرة. وتعد عملية إيقاف النزف من أهم خطوات هذه العملية والتي يمكن إجرائها من خلال عدة تقنيات ولكن أفضلية إحدى هذه الطرق على الأخرى لم يزل إلى الوقت الحاضر محلا للبحث والمناقشة.

أجريت هذه الدراسة المستقبلية للمقارنة بين طريقتين من طرق إيقاف النزف في عملية استئصال اللوزتين وهي طريقة العقد الجراحية وطريقة الكي الكهربائي ثنائي القطب .وقد أجريت في قسم الأنف والإذن والحنجرة في مستشفى الصدر التعليمي في محافظة النجف في العراق من الفترة مابين حزيران 2008 ولغاية تشرين الثاني 2009 .وقد شملت الدراسة 250 مريضا أجري لهم عملية استئصال اللوزتين. 125 مريضا منهم تم إيقاف النزف باستخدام العقد الجراحية والنصف الأخر(125مريضا) تم إيقاف النزف لديهم باستخدام الكي الكهربائي ثنائي القطب وأخضعت النتائج للدراسة المقارنة. وأظهرت

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النتائج إن معدل وقت العملية باستخدام الكي الكهربائي كان اقل من معدل وقت العملية باستخدام العقد الجراحية. وان حالات النزف الأولي كانت مصاحبة لاستخدام طريقة العقد الجراحية أكثر من المرضى الذين تم استخدام طريقة الكي الكهربائي في خطـــوات إيقاف النزف لديهم. بينما أظهرت الدراسة إن النزف الثانوي كان أكثر حدوثا في المرضى الذين أوقف النزف لديهم بطريقة الكي الكهربائي ثنائي القطب

وقد خلصت الدراسة إلى إن طريقة إيقاف النزف باستعمال طريقة الكي الكهربائي ثنائي القطب تساعد في تقليل وقت العملية. وان طريقة الكي الكهربائي كانت مصاحبة بأقل مستوى من الألم في الساعات الأربع والعشرون الأولى بعد العملية مقارنة بطريقة العقد الجراحية.

Introduction

Tonsillectomy is one of the most commonly performed surgical procedures particularly in pediatric age group all over the world .It is done annually for 250000 patients in USA. . The operation becomes popular in the 19th century after the invention of Guillotine tonsillotome.Different techniques and instruments has been used to remove the tonsils with haemostasis ,but none of them were found satisfactory .In the last two decades new techniques were introduced into the clinical practice (including harmonic scalpel ,bipolar diathermy) which they have revolutionized the surgery of tonsillectomy .These new techniques were used to reduce the time of operation ,to achieve prompt control of bleeding during surgery and to minimize the post-operative pain enabling the patient to resume his or her diet habit and normal daily activity in a short period of time[1].

The indications of tonsillectomy have remained controversial since its inception. American Academy of otolaryngology –Head and Neck surgery (AAO-HNS) recommends the following indications:

Recurrent episodes of acute tonsillar infection.

Recurrent peri-tonsillar abscess.

Biopsy tonsillectomy

Patients with obstructive sleep apnea due to tonsillar hypertrophy.

Approach to other surgical procedures e.g. GPN or styalgia [2]

Whatever the surgical procedure used and inspite of the modern method that are available today but still debate is going on for the control of haemorrhage which is a significant complication during tonsillectomy and about 5 % of patients may face such a problem at any time from the first 24 hours to the day 10 post-operatively. Haemorrhage has been classified according to the time

1-Primary bleeding occurring during the first 24 hours

2- Secondary bleeding: after 24 hours of surgery

The term reactionary haemorrhage is also used for intra-operative bleeding[3]

Electrocautery (bipolar diathermy) and silk ligation are the two common means to control bleeding during tonsillectomy. The bipolar diathermy is preferred on unipolar diathermy for the following reasons:

1-Unipolar diathermy is difficult to control the depth and heat coagulation and subsequent devitalization because the power is released at the site of application and small variation in tissue depth in tonsillar fossa can involve adjacent vital structures resulting in variable post-operative pain.

2- In bipolar diathermy the area of tissue ligation is localized between the fine tips of diathermy forceps causing less tissue necrosis in a more controlled and precise fashion resulting in less post –operative pain [4-6].

The aim of the study was to compare the morbidity during tonsillectomy

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using two different methods of haemostasis during surgery i.e. ligation versus diathermy.

Patients and Methods

This is a prospective, comparative study conducted between June 2008 – November 2009 where 250 patients gathered from the out patient department of Al-Sadder teaching hospital, College of medicine, Kufa University, Iraq. Tonsillectomies in all cases were performed according to the criteria approved by the American academy of otolaryngology –head and neck surgery and we have excluded cases with bleeding tendency, acute upper respiratory tract infection & recent episode of acute tonsillitis.

The pre-operative investigations performed were complete blood picture, bleeding and clotting time, prothrobin time, urine analysis, chest x-ray and ECG.

All operations were performed by the same surgeon under general anesthesia using the dissection method leaving behind the capsule intact. The control of bleeding was done by bipolar diathermy in 125 patients (50 % of cases) and silk ligation in the other 125 patients (50%).

The duration of the operation from the application of mouth gag to its removal after completion was noted.

All cases were kept for observation in the recovery room for any immediate post-operative bleeding .the patients were shifted to the ward after complete recovery from anesthesia. Monitoring of vital signs: pulse rate blood pressure, respiratory rate during the next 24 hours for all patients was done.

The bleeding was graded as:

false alarm : no actual evidence of bleeding (e.g. vomited clot)

Minor bleeding: no action needed apart from observation.

Moderate bleeding: that requires active non- surgical intervention e.g. drip, cross –match, clot removal, IV antibiotics.

Major bleeding : required examination under anesthesia to control the bleeding, with or without blood transfusion [4]

Long –term follow up:

The patients were followed up at monthly interval for 6 months .During each visit particular attention was given to smoothness of tonsillar fossa; any hypertrophied lingual tonsils and any concomitant pharyngitis.

Results

Of the 250 patients included in the study, 160 male (64%) and 90 female patients (36%)

Table 1: gender distribution

gender	No. of patients	%
male	160	64%
female	90	36%
Total	250	100%

The ages of the patients were ranged between 3 years and 57 years and the following table shows the age distribution of our patients:

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Table 2 age- wise distribution

Age group	No. of patients	%
3-10 years	70	28%
11-20 years	100	40%
21-30 years	50	20%
31-40 years	24	9.6%
41- 50 years	2	0.8%
51- 60 years	4	1.6
	250	100%

Distribution of patients according to the indications of tonsillectomy

Table 3 indications of tonsillectomy

Indication	No. Of patients	%
Recurrent tonsillitis	180	72
Sleep apnea due to bilateral enlarged tonsils	50	20
Past history of quinsy	13	5.2
Unilateral tonsillar enlargement	7	2.8
Total	250	100%

The operation time was 20 minutes with bipolar diathermy and 45 minutes with silk suture.

The patients assessed for the post operative pain according to level of analgesia required at day 1, 3,7and 10 day post-operatively.

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Table 4 the level of post operative pain

Post operative day	Diathermy		Ligation	
	No. Of patients	%	No. of patients	%
1	95	76 %	89	71.2
3	20	16 %	22	17.6
7	6	4.8 %	8	6.4%
10	4	3.2 %	6	4.8
	125	100%	125	100

The patients classified into 3 groups, those who develop no hemorrhage or developed primary haemorrhage and the third group who developed secondary hemorrhage.

Table 5 incidence of post operative hemorrhage

	Diathermy		Ligation	
incidence	No. of patients	%	No. of patients	%
Primary hemorrhage	9	7.2%	16	12.8%
Secondary haemorrhage	6	4.8	7	5.6 %

Severity of post-operative haemorrhage

Table 6 Severity of post-operative hemorrhage

Grade of severity	Diathermy	Ligation
Minor	9	12
Moderate	5	6
Major	1	5
Total	15	23

Long term follow – up

Table 7 Follow up parameters

Parameter	1 month		3 month		6 month	
	Diathermy	Ligation	Diathermy	Ligation	Diathermy	Ligation
Smooth tonsillar fossa	104	100	120	115	125	118
Hypertrophied lingual tonsils	0	7	0	15	5	47
Associated pharyngitis	3	191	5	28	12	42

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Discussion

This is a prospective, comparative study to evaluate the morbidity associated with usage of diathermy in comparison with silk ligation in case of tonsillectomy.

The study involved 250 patients underwent tonsillectomy by the same surgeon (to achieve high degree of accuracy with same level of surgical expertise). 125 patients haemostasis was done by bipolar diathermy and 125 patients haemostasis was secured by ligation.

In this study out of 250 patients, 160(64%) patients male and 90 (64%) female patients

The ages of the patients were ranged from 3 years to 57 years which reflect that tonsillectomy is a common operation and can be done in very young and old patients or reflect that indication of tonsillectomy can exist in different age group.

The commonest indication to remove the tonsils was recurrent attacks of tonsillitis which are defined as 5 attacks of acute genuine tonsillitis per year for 3 consecutive years in children and 3 in adults. The next indication was obstructive sleep apnea due to bilateral tonsillar enlargement, past history of peritonsillar abscess and finally unilateral tonsillar enlargement; these indications are adopted by the American academy of otolaryngology-head and neck surgery and are the same sequence of indications reported byAl-Mansoori [5], Araf Raza Khan [4].

The average operation time was 20 minutes with diathermy compared to 45 minutes with silk ligation, LaSalle [7] et al who studied 120 cases and found little difference in the two methods with an average of 15.3 minutes with bipolar diathermy and 16.3 minutes with silk ligation while Watson [2] reported results nearly similar to those adopted in this study.

The incidence of post tonsillectomy bleeding was seen in 12 % of cases of bipolar diathermy and 16% in silk ligation and the difference between the two methods is not significant , these results are similar to those of Al-Mansoori AM [5] & Arif Raza Khan[4].

The primary bleeding is reported along with silk ligation (16%) while secondary bleeding is more along with bipolar diathermy. Arif Rhiza khan explained that by excessive tissue necrosis induced by diathermy may increase the risk of bleeding [4].

The severity of post operative haemorrhage was found to be greater with silk ligation than bipolar diathermy and the severity is assessed according to the action required to stop bleeding, Al-Mansoori et al have studied the same problem and found that no significant difference [5], while Roy A [8] et al & Ritter GM et al [9] have reported results similar to those of this study

The post operative analgesic requirement in this study during the first 24 hours was almost equal in both methods of haemostasis but it becomes more during the day 7th – 10th post operative with silk ligation method, these results are similar to those of Arif Raza Khan 4 while Kotecha B et al [10] found no significant difference in severity of pain and analgesia requirement in methods of hemostasis, while Hussein AS have reported the necessity of bupovacain local infiltration in control of post-tonsillectomy pain following silk ligation [11].

The outcome of surgery was assessed in this study according to 3 parameters (smoothness of tonsillar fossae, any hypertrophied nodes and

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any associated pharyngitis) and we have found that bipolar diathermy was more effective to cause smooth tonsillar fossae, while the hypertrophied lingual tonsils are more with ligation than bipolar diathermy likewise the associated pharyngitis, the follow up was monthly for 6 months These results were correlated with that of Michel G [12] study & Kristenson J et al [13].

Conclusions

The bipolar diathermy is faster than silk ligation in achieving haemostasis resulting in shorter surgical and anesthetic time saving a lot of cost.

The bipolar diathermy is less painful post-operatively resulting in shorter recovery

The incidence of primary hemorrhage is more with silk ligation and less with bipolar diathermy while secondary haemorrhage is more associated with bipolar diathermy .

long term follow up at monthly interval has shown less associated pharyngitis ,less hypertrophied nodes, and more smooth tonsillar fossae.

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