

Diathermy Versus Ligation for Hemostasis in Tonsillectomy - A Study on Postoperative Pain and Hemorrhage

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ABSTRACT

Objectives: To assess the difference between suture ligation and diathermy techniques of tonsillectomy in our setting and to select a better and safer haem procedure for tonsillectomy.

Study Design: Single blind comparative interventional type of study.

Place and Duration of Study: This study was conducted in Bahawal Victoria Hospital Bahawalpur and Shahina Jamil Hospital Abbottabad from 1st March 2010 to 31st January 2011.

Materials and Methods: 80 patients were divided into suture ligation and diathermy groups and their postoperative pain and bleeding rates were compared and analyzed

Results: We found that the difference in results of hemostasis between ligation and diathermy was statistically significant in terms of postoperative pain. Regarding postoperative haemorrhage, the difference between diathermy and ligation was non-significant

Conclusions: It is concluded that in our set up, tonsillectomy hemostasis with diathermy was a better and safer technique comparing ligation especially in terms of postoperative pain.

Key Words: Tonsillectomy, Ligation, Diathermy

INTRODUCTION

Tonsillectomy is a classical operation in otolaryngology and the most frequently performed in some industrialized countries¹. However, tonsillectomy may be performed and indicated in recurrent chronic tonsillitis². This is the most usual indication in our set up and was taken into consideration to select the subjects for tonsillectomy in this study. The operation of tonsillectomy that is, the removal of entire tonsil with its capsule was first described in 1906 by William Lincoln and Illinois in Chicago and in the same year Ovidus Arthur and Michigan described the use of knife and a specially designed pair of scissors to remove the tonsils in their one operation without the use of a guillotine or an automatic instrument³.

Tonsillectomy is a two stepped procedure. One is to remove the tonsils from the bed and second is to secure hemostasis. Securing of hemostasis during tonsillectomy is the integral and utmost important step in the entire procedure. It bears a significant role in the postoperative morbidity of the patient. For the purpose of hemostasis, different techniques are used. Ligation and diathermy are two commonly used techniques for hemostasis on the tonsillar bed⁴.

Ligature of the vessels to stop the bleeding during tonsillectomy was first adopted by Cohen⁵. The use of (monopolar) diathermy in tonsillectomy was first introduced by Haase, Noguera and Johnson^{6,7}. After that Reed and Sinder refined the technique by using bipolar diathermy⁸.

Both techniques of hemostasis during tonsillectomy have their merits and demerits. Moreover these techniques do influence the postoperative morbidity in terms of postoperative pain and bleeding. Because of the diversity in opinions regarding efficacy and safety of these two techniques of hemostasis in the international literature, this topic has been selected to observe the differences in the results of these two techniques in our setting. This topic has been studied in consideration with postoperative morbidity in the form of haemorrhage (postoperative bleeding) and postoperative pain.

Importance of the topic selected is also evident with the fact that both of these techniques of hemostasis are frequently practiced in our setting and there were no clear cut grounds to prefer one technique over the other. It is merely the surgeon's choice to use any technique for tonsillectomy hemostasis. It was therefore necessary to conduct a study in this setting which could assess both of these techniques, their morbidity and outcome and help to evolve a better, safer and cheaper method of tonsillectomy hemostasis.

We made a null hypothesis that there was no difference between the results of suture ligation and diathermy for tonsillectomy hemostasis regarding postoperative morbidity.

MATERIAL AND METHODS

This study was conducted in Bahawal Victoria Hospital Bahawalpur and Shahina Jamil Hospital Abbottabad from 1st march 2010 to 31st January 2011

This study was initiated after approval from hospital ethical committee. Patients were randomly divided into two groups irrespective of age group and gender. This study was initiated after approval from hospital ethical committee. Each group of the patients comprised of equal number of patients, which was 40 in each group. In the first group of patients, suture ligation was applied and to the second group of patients, unipolar diathermy was applied as a technique of hemostasis during tonsillectomy.

The inclusion criteria included the patients with the clinical diagnosis of chronic recurrent tonsillitis needing tonsillectomy and patient between the ages of 5 to 30 years.

The exclusion criteria included all the patients requiring tonsillectomy with indication other than recurrent tonsillitis, patients below 5 years or above 30 years of age and patients having bleeding or clotting disorders. Postoperative pain was questioned from the patients on the first postoperative day at least 6-8 hours after breaking the order of nothing per oral (NPO).

During the observation, no analgesic was given to the patient until precise recording of postoperative pain on the questionnaire, was done.

Regarding reactionary haemorrhage, all patients were closely assessed for the presence or absence of any episode of haemorrhage from tonsillar fossae. Tonsillar fossae were frequently examined to see any evidence of blood clot or fresh ooze.

Regarding secondary haemorrhage, every patient included in the study was requested to come twice for the follow up visit at the outpatient department with the interval of one week. Patients were also strictly advised to come immediately to department of otolaryngology in case any episode of haemorrhage occurred during the interval of two weeks.

RESULTS

In first group of ligation technique (40) regarding postoperative pain, 9 patients (22.5%) suffered mild, 22 patients (55%) suffered moderate, 8 patients (20%) suffered severe and only 1 patient (2.5%) suffered very severe degree of pain. In second group of diathermy technique (40) regarding postoperative pain, 30 patients

Table No.1: Results of comparison of postoperative pain (n=40)

Degrees of Pain	No. of patients (%age)Observed in ligation method	No. of Patients (%age)Observed in diathermy method
Mild	9(22.5%)	30(75%)
Moderate	22(55%)	10(25%)
Severe	8(20%)	0(0%)
Very severe	1(2.5%)	0(0%)

n= total number of patients in the group

(75%) got mild and 10(25%) patients got moderate degree of postoperative pain. Not a single patient experienced severe or very severe pain.

In first group of ligation technique (40) regarding postoperative haemorrhage, only two 2 patients (5%) got reactionary hemorrhage and none got secondary haemorrhage. In second group of diathermy technique (40) regarding reactionary and secondary haemorrhages, no patient got any type of haemorrhage

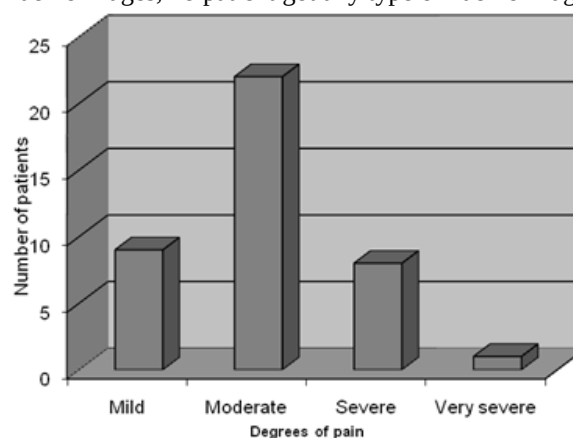


Figure No.1: Results of postoperative pain with ligation technique

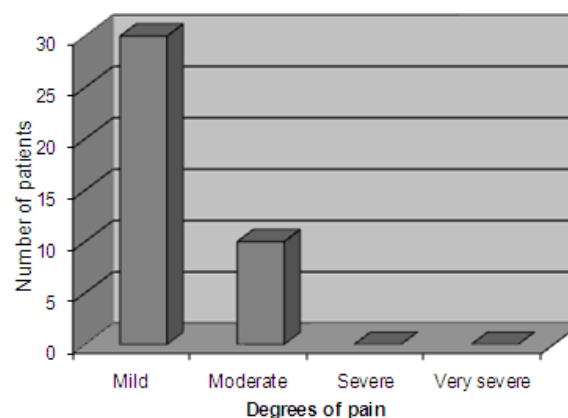


Figure No.2: Results of postoperative pain with diathermy technique

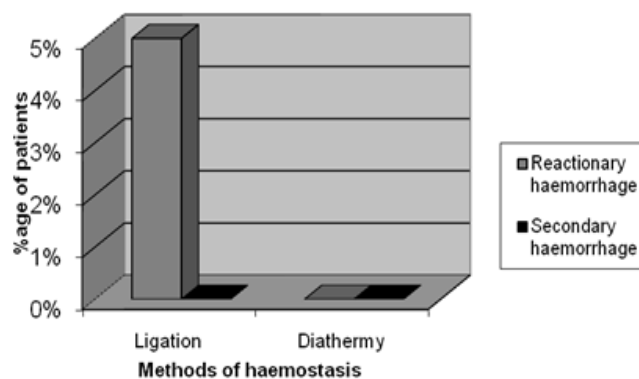


Figure No.3: Results of postoperative haemorrhage in the two techniques

Table No. 2: Results of comparison of reactionary and secondary haemorrhage (n=40)

Type of Haemorrhage	No. of Patients (%age) Observed in ligation method	No. of Patients (%age) Observed in diathermy method
Reactionary	2(5%)	0(0%)
Secondary	0(0%)	0(0%)

DISCUSSION

Postoperative pain and haemorrhage are the chief elements of post tonsillectomy morbidity. Coming to the results of this study in terms of postoperative pain; it was found that patients experienced more postoperative pain with the technique of ligation as compared with diathermy. So the result of postoperative pain in this study has opposed the initial null hypothesis which was postulated at the start. In the international literature, some studies have concluded that diathermy increases postoperative pain in adults⁹, while in some studies it has been mentioned that diathermy causes less postoperative pain on the first postoperative day^{10,11}. Some authors have found no difference in the postoperative morbidity with the two techniques¹². Even the authors who assessed electro dissection technique of tonsillectomies, they also found much less postoperative pain by using diathermy in the patients¹³. Nunez DA and Provan J in their study, published in 2000 July had found much decreased postoperative tonsillectomy pain using electrocautery (diathermy)¹⁴. Hemant et al. also found that electro dissection tonsillectomy is associated with less initial post operative pain¹⁵.

In contrary to above studies Cochrane demonstrated increased pain in diathermy group. Review of all these studies show one common thing that most of the researchers had found using the technique of diathermy more effective safe and time saving as compared to the other techniques.

Now considering results of our study in terms of postoperative haemorrhage, there was no significant difference in the occurrence of reactionary haemorrhage between the two techniques. Secondary haemorrhage was not seen in any of the patients of total sample in the study. These results support the initial research hypothesis as well as many studies in the international literature. Tay HL in his study concluded no difference noted in the incidence of postoperative haemorrhage between diathermy and ligation¹¹. Regarding the incidence of secondary haemorrhage Salam MA, and Cable HR, had found no significant difference between diathermy and ligatures⁹. However, few studies showed diathermy as a better technique for preventing postoperative bleeding^{16, 17}. Likewise few studies concluded ligation technique as a better one regarding the incidence of postoperative haemorrhage comparing diathermy¹⁸. Adel Sahib in a study demonstrated

reduced intraoperative bleeding with diathermy technique and reduced secondary hemorrhage with ligation technique¹⁹.

So it could be stated that the use of diathermy technique of tonsillectomy hemostasis given satisfactory results for the patients in our study regarding postoperative morbidity. Moreover, purchasing suture material for the technique of ligation put a financial burden on the patients comparing diathermy which was readily available in the operation theatre for all the patients free of cost.

CONCLUSION

From the results of our study this can be concluded that diathermy technique of hemostasis during tonsillectomy causes significantly less postoperative pain in the patients as compared to the technique of ligation in our setting. Regarding the prevention of postoperative haemorrhage, both the techniques of tonsillectomy hemostasis, ligation with sutures and applying diathermy, were equally effective and safe. Hence in the circumstances of our setting diathermy should be a technique of choice for hemostasis during tonsillectomy.

However, there is need to conduct a further study which should compare the postoperative morbidity of tonsillectomy hemostasis with unipolar diathermy and bipolar diathermy, especially in our set up.

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