

Comparison of Monopolar with Bipolar Diathermy in Patients Undergoing Tonsillectomy

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ABSTRACT

Aim: To compare monopolar with bipolar diathermy in terms of mean operation timings in tonsillectomy.

Study design & duration: Randomized control trial from June 2013 to March 2014.

Methods: A total of 100 cases (50 in each group) between 5-50 years of both gender with the history of recurrent acute tonsillitis were included in the study while patients with hematological disorders-confirmed on necessary blood tests, patients in which tonsillectomy is carried out as a part of another operation like removal of styloid process or excisional biopsy for suspected malignancy, congenital disorders like Down syndrome, and submucous cleft palate were excluded from the study.

Results: In our study, age distribution of the patients was done which shows that 31(62%) in Group-A and 34(68%) in Group-B were between 5-20 years and 19(38%) in Group-A and 16(32%) in Group-B were between 21-40 years, mean±sd was computed as 18.62±9.17, 28(56%) in Group-A and 30(60%) in Group-B were male while 22(44%) in Group-A and 20(40%) in Group-B were females, mean operation timing in tonsillectomy was recorded as 6.25±1.81 in Group-A and 11.9±2.12 in Group-B, p value was calculated as 0.0001 which shows a significant difference between the two groups.

Conclusion: On comparison of monopolar with bipolar diathermy in terms of mean operation timings in tonsillectomy, monopolar diathermy is found with significantly reduced intra operative time.

Keywords: Tonsillectomy, monopolar diathermy, bipolar diathermy, comparison, mean operative time

INTRODUCTION

Tonsils are part of lymphoid tissues in the oropharynx known as the Waldeyer's ring. They perform the important function of acting as sentinels at the portal of air and food passages. Inflammation of the tonsillar tissue is known as tonsillitis, and is commonly due to inflammatory process or malignancy. Untreated tonsillitis can lead to peritonsillar abscess which is a potential parapharyngeal abscess¹. The first known surgical removal of tonsils i.e., tonsillectomy was performed by Cornelius Celsius two thousand years ago.² In modern times tonsillectomy is one of the most commonly performed procedures to relieve the patient of repeated attacks (three to four per year for two to three years) of acute tonsillitis which result in significant loss of school or work^{3,4} and approximately 50,000 are carried out in UK each year⁵. It is rarely performed for other diseases such as Eagle's syndrome i.e., to remove an elongated styloid process. Indications of tonsillectomy vary widely.

Traditional tonsillectomy has now been replaced by newer methods such as Harmonic scalpel, which utilizes ultrasonic waves to dissect and coagulate tissues at lower temperatures than those generated by electrocautery⁶. Coblation technique uses the formation of radiofrequency mediated ions to break covalent bonds and vaporize tissues at a temp of

only 60–80°C^{7,8}. Carbon Dioxide (CO₂) laser microsurgery has also been used to perform tonsillectomy. Blood loss in laser technique is less than the conventional technique. Laser tonsillectomy is generally used for patients with clotting disorders.⁹ Thermal Welding System (TWS) uses direct heat and pressure to seal and divide tissues¹⁰.

Control of hemorrhage during tonsillectomy, has always been the prime concern for the otorhinolaryngologist to minimize the morbidity and mortality¹¹. Monopolar and bipolar diathermy are both used to ensure hemostasis post tonsillectomy. While monopolar diathermy coagulates by simply cauterizing the area with increase thermal spread over surrounding tissues, the bipolar selectively cauterizes the area between the prongs thereby reducing the amount of tissue damage¹².

The local data is lacking on the subject, use of monopolar diathermy as compared to bipolar diathermy must be evaluated in term of operative timings, so that better procedure can be recommended.

MATERIAL AND METHODS

A total of 100 cases (50 in each group) between 5-50 years of both gender with the history of recurrent acute tonsillitis were included in the study while patients with hematological disorders-confirmed on necessary blood tests, patients in which tonsillectomy

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is carried out as a part of another operation like removal of styloid process or excisional biopsy for suspected malignancy, congenital disorders like Down syndrome, and submucous cleft palate were excluded from the study.

After obtaining informed written consent, one hundred patients undergoing tonsillectomy at DHQ Hospital Sahiwal during the study period -fitting the inclusion criteria were selected. Data of all patients included in the study was recorded in the register. The patients were inquired about their demographic profile i.e., age, sex, education status, residence and profession. History of present illness was recorded in terms of severity of symptoms and duration. Blood CP and Throat swab was done for every patient. Non probability consecutive sampling technique was used for sampling. Patients were divided into two groups 'group A & group B' by random allocation based on lottery method. The patients were managed by tonsillectomy under General Anesthesia. Group 'A' included patients in whom monopolar diathermy was used for hemostasis per operatively and in patients of Group 'B' bipolar diathermy was utilized for hemostasis.

Data analysis was done using SPSS version 12. P value of less than 0.05 was taken as significant. Mean and standard deviations was calculated for quantitative variables like age and duration of operation time. Frequency and percentages were calculated for qualitative variables like gender of patient. Independent samples t test was used to compare mean operative time in both the groups.

RESULTS

In our study, age distribution of the patients was done which shows that 31(62%) in Group-A and 34(68%) in Group-B were between 5-20 years and 19(38%) in Group-A and 16(32%) in Group-B were between 21-40 years, mean±sd was computed as 18.62±9.17 (Table 1). Gender distribution of the patients was done which shows that 28(56%) in Group-A and 30(60%) in Group-B were male while 22(44%) in Group-A and 20(40%) in Group-B were females (Table 2). Mean operation timing in tonsillectomy was recorded as 6.25±1.81 in Group-A and 11.9±2.12 in Group-B, p value was calculated as 0.0001 which shows a significant difference between the two groups (Table 3).

Table 1: Age distribution of the subjects (n=100)

Age	Group-A (n=50)	Group-B(n=50)
5-20 Years	31(62%)	34(68%)
21-40 Years	18(38%)	16(32%)

Mean and sd= 18.62±9.17

Table 2: Gender of the subjects (n=100)

Gender	Group-A (n=50)	Group-B (n=50)
Male	28(56%)	30(60%)
Female	18(38%)	16(32%)

Table 3: Comparison of monopolar with bipolar diathermy in terms of mean operation timings in tonsillectomy

	Group-A (n=50)	Group-B (n=50)
Mean duration	6.25±1.81	11.9±2.12

DISCUSSION

Tonsillectomy results in a severe sore throat, especially in the first few days, until the exposed and inflamed muscle becomes covered with regenerated mucosa. There are a variety of techniques of tonsillectomy including monopolar and bipolar diathermy, blunt dissection, and radiofrequency tonsil ablation and coblation.

Operating time, intra-operative blood loss, postoperative pain, return to normal diet and activity and secondary haemorrhage are the points of concern that have divided the surgeons between different techniques and are the objectives of clinical research going around globally.

Monopolar diathermy has been proved as a more safe technique for hemostasis with statistically significant less operative time but there was a paucity of local data on the subject, use of monopolar diathermy as compared to bipolar diathermy which was required to evaluated in term of operative timings, so that better procedure can be recommended.

In our study, age distribution of the patients was done which shows that 31(62%) in Group-A and 34(68%) in Group-B were between 5-20 years and 19(38%) in Group-A and 16(32%) in Group-B were between 21-40 years, mean±sd was computed as 18.62±9.17, 28(56%) in Group-A and 30(60%) in Group-B were male while 22(44%) in Group-A and 20(40%) in Group-B were females, mean operation timing in tonsillectomy was recorded as 6.25±1.81 in Group-A and 11.9±2.12 in Group-B, p value was calculated as 0.0001 which shows a significant difference between the two groups.

Our findings are in agreement with a study showing intraoperative time of 7.3 min±1.5 with monopolar electrocautery (p=0.034)¹³. While, Ahmed Hesham observed an operative time of 11.4±2.84 min (p<0.05) with bipolar diathermy¹⁴.

Another study¹⁵ evaluated the safety of bipolar electro dissection technique and found that it ranged between 10 to 20 minutes, being longer in adults, apparently on account of more fibrosis in the tonsil bed.

Manal A Bukhari¹⁶ compared cold dissection to monopolar tonsillectomy in terms of operative time and recorded that monopolar tonsillectomy is a safer technique. It significantly reduces the operative time and intra operative blood loss, similarly with our findings.

Weimert et al¹⁷ also recorded decrease in operative time by using cautery technique, average 2.5 minutes for the cautery side and 6 minutes for dissection/snare side.

In light of the current study supported with the other studies, our hypothesis that “operative time is less with monopolar diathermy as compared to bipolar diathermy in tonsillectomy” is justified and provides a better hemostasis intra operatively, and not showing increased post-operative haemorrhage. The limitation of the study was that we included only intra-operative time for comparison of both techniques and other outcome variables like post operative pain, hospital stay and intra-operative bleeding were not included which should also be compared in further studies.

The findings of the current study are primary in our local population, further trials are also required to authenticate our findings.

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