

## Original Article



# Monopolar Diathermy Tonsillectomy Versus Dissection Method Tonsillectomy

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### Abstract

**Background:** Tonsillectomy is one of the most common surgical procedures performed worldwide by otorhinolaryngologists for different indications. Tonsillectomy is often performed as day-case surgery, which increases the demands of a satisfactory postoperative pain control and a low risk of early postoperative bleeding. **Objective:** The aim of the study was to compare the Monopolar diathermy and Dissection methods of tonsillectomy and evaluate their advantages and disadvantages during surgery, convalescence. **Materials and Methods:** Two hundred children were recruited for this study during the period of five years from January, 2014 to December, 2018 at Otolaryngology department of Khwaja Yunus Ali Medical College and Hospital (KYAMCH). Subjects between the age of 5 and 25 years listed for tonsillectomy were included. Subjects were recommended not to have aspirin within the 2 weeks before surgery. **Results:** The mean duration of operation was found  $10.6 \pm 0.4$  minutes in group A and  $17.0 \pm 0.7$  minutes in group B. The difference was statistically significant ( $p < 0.05$ ) between two groups. At 1st day, 11(11.0%) patients had throat pain in group A and 23(23.0%) in group B. At 2nd day, 14(14.0%) patients had throat pain in group A and 25(25.0%) in group B. Which were statistically significant ( $p < 0.05$ ) between two groups. **Conclusion:** The monopolar diathermy tonsillectomy appears to cause less bleeding, postoperative pain and less time consuming in compare with the dissection tonsillectomy although patients experience slightly more pain than dissection Method.

**Keywords:** Monopolar diathermy, Dissection method, Tonsillectomy.

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### Introduction

Tonsillectomy is one of the most common surgical procedures performed worldwide by otorhinolaryngologists for the different indications.<sup>1</sup> There are several existing techniques to perform tonsillectomy, including cold dissection, guillotine excision, cryosurgery, ultrasonic removal, laser tonsillectomy, and monopolar and bipolar diathermy dissections. Ideally, the procedure to be employed should be fast, safe, painless, and bloodless, and associated with rapid recovery.<sup>2</sup> Infectious and inflammatory diseases involving the tonsils (Fig-1) account for a significant proportion of childhood illnesses and often result in tonsillectomy; one of the most common surgical procedures of childhood.<sup>3</sup> Despite the developments in techniques and technology, tonsillectomy still carries a

relatively high risk of morbidity. The two most commonly used techniques are Cold Dissection-Snare and Electro dissection.<sup>4</sup> Tonsillectomy is often performed as day-case surgery, which increases the demands of a satisfactory postoperative pain control and a low risk of early postoperative bleeding. The use of hot dissection techniques is associated with low rates of early postoperative bleeding and is therefore useful in day-case surgery. There are different hot dissection techniques including bipolar diathermy, harmonic scalpel, coblation and monopolar cautery.<sup>5</sup> (Fig-2)

### Materials and Methods

Two hundred children were recruited for this study during the

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period of five years from January, 2014 to December, 2018 at Otolaryngology department of Khwaja Yunus Ali Medical College & Hospital (KYAMCH). Children/ patients between the age of 5 and 25 years listed for tonsillectomy were included. Study subjects were recommended not to have aspirin within the 2 weeks before surgery. Study subjects with acute tonsillitis 6 weeks before surgery, the indication of malignancy or peritonsillar abscess, history of blood or cardiovascular disease and those with bleeding disorders were excluded from this study. It was a prospective single blind controlled study to compare the two methods in terms of intraoperative time, intraoperative bleeding, post operative pain and post operative hemorrhage. Patients were randomly selected to have either the right or left tonsils removed by either techniques, Monopolar diathermy tonsillectomy or Dissection tonsillectomy method. It was a prospective study, where patients were aware of the operation technique but were not aware on which side the technique was used. The operation procedure was explained to the patients before the surgery and their written consent was obtained. All the operations were done under general anesthesia. Intraoperative bleeding on the each side was recorded by measuring the amount of blood in milliliters collected in the suction bag and 19cm x 14cm size of standard gauge was used. The blood loss was 4 ml if the gauge piece was fully soaked and it was 2.5ml if gauge piece was partially soaked. Throat pain was evaluated by asking the patients about the side of the tonsillectomy they had more pain on the first operative day. Operation time was also measured for each tonsil. Data analysis was done using simple frequency and percentage.

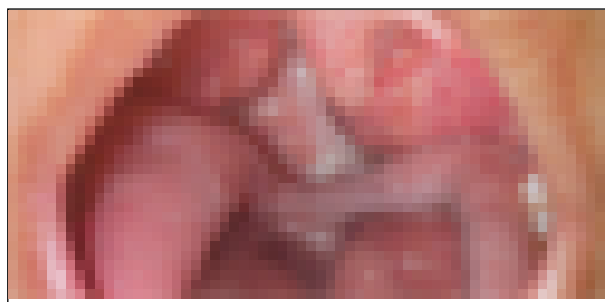


Figure 1. Study subjects Chronic Tonsillitis.

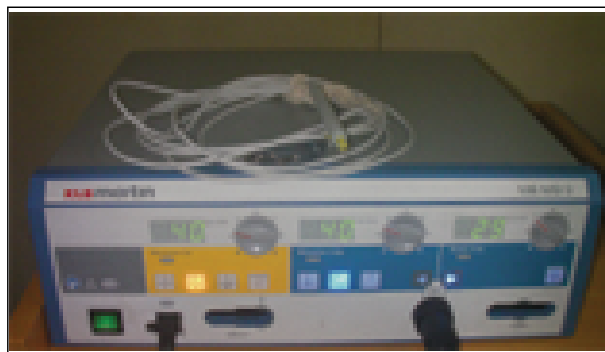


Figure 2: Monopolar Diathermy Machine.

Give two images/ figures of your operation be diathermy or dissection

**Results**

The mean age was found 14.2±4.8 years in group A and 13.9±5.0 years in group B. Almost two third (65.0%) patients were male in group A and 53(53.0%) in group B. The difference were not statistically significant (p>0.05) between two groups (Table I). Sixty one (61.0%) patients were operated right side in group A and 63(63.0%) in group B. The difference was not statistically significant (p>0.05) between two groups (Table II). Mean amount of bleeding was found 36.2±3.8 ml in group A and 76.1±4.1 ml in group B. The difference was statistically significant (p<0.05) between two groups (Table III). Mean duration of operation was found 10.6±0.4 minutes in group A and 17.0±0.7 minutes in group B. The difference was statistically significant (p<0.05) between two groups (Table IV). At 1st day, 11(11.0%) patients had throat pain in group A and 23(23.0%) in group B. At 2nd day, 14(14.0%) patients had throat pain in group A and 25(25.0%) in group B. Which were statistically significant (p<0.05) between two groups (Table V).

**Table I:** Demographic variable of the study patients

Demographic variable	Group A (n=100)		Group B (n=100)		P value
	n	%	n	%	
Age (years)					
10	62	62.0	69	69.0	
11-25	38	38.0	31	31.0	
Mean±SD	142	±4.8	139	±5.0	a0.666 <sup>ns</sup>
Sex					
Male	65	65.0	53	53.0	b0.084 <sup>ns</sup>
Female	35	35.0	47	47.0	

ns= not significant

aP value reached from unpaired t-test

bP value reached from chi square test

Group A= Monopolar diathermy tonsillectomy

Group B= Dissection method tonsillectomy

**Table II:** Using the electrocautery of the study patients

Using the electrocautery	Group A (n=100)		Group B (n=100)		P value
	n	%	n	%	
Right	61	61.0	63	63.0	0.701 <sup>ns</sup>
Left	39	39.0	37	37.0	

ns= not significant

P value reached from chi square test

**Table III:** Amount of bleeding of the study patients

	Group A (n=100)		Group B (n=100)		P value
	Mean	±SD	Mean	±SD	
Amount of bleeding (ml)	36.2	±3.8	76.1	±4.1	0.001 <sup>s</sup>
Range (min-max)	10	-110	20	-130	

s= significant

P value reached from unpaired t-test

**Table IV:** Duration of operation of the study patients

	Group A (n=100)		Group B (n=100)		P value
	Mean	±SD	Mean	±SD	
Duration of operation (minutes)	10.6	±0.4	17.0	±0.7	0.001 <sup>s</sup>
Range (min-max)	8	-12	12	-18	

s= significant

P value reached from unpaired t-test

**Table V:** Throat pain of post operative period

Throat pain	Group A (n=100)		Group B (n=100)		p value
	n	%	n	%	
<24 hours	10	10.0	19	19.0	0.07 <sup>ns</sup>
1 <sup>st</sup> day	11	11.0	23	23.0	0.023 <sup>s</sup>
2 <sup>nd</sup> day	14	14.0	25	25.0	0.049 <sup>s</sup>
3 <sup>rd</sup> day	18	18.0	27	27.0	0.123 <sup>ns</sup>
4 <sup>th</sup> day	21	21.0	28	28.0	0.249 <sup>ns</sup>
5 <sup>th</sup> day	24	24.0	30	30.0	0.339 <sup>ns</sup>
6 <sup>th</sup> day	23	23.0	27	27.0	0.514 <sup>ns</sup>
7 <sup>th</sup> day	17	17.0	23	23.0	0.289 <sup>ns</sup>
8 <sup>th</sup> day	12	12.0	19	19.0	0.171 <sup>ns</sup>
9 <sup>th</sup> day	6	6.0	10	10.0	0.297 <sup>ns</sup>
10 <sup>th</sup> day	2	2.0	4	4.0	0.341 <sup>ns</sup>

s= significant, ns= not significant

P value reached from chi square test

## Discussion

In this present study it was observed that the mean age was found 14.2±4.8 years in group A and 13.9±5.0 years in group B. Almost two third (65.0%) patients were male in group A and 53(53.0%) in group B. The difference were not statistically significant (p>0.05) between two groups. Bukhari and Al-Ammar study observed that the mean age was found 7.37 years. Sixty three (63%) patients were male and 37(37%) were female.<sup>6</sup> In this study it was observed that 61(61.0%) patients were operated right side in group A and 63(63.0%) in group B. The difference was not statistically significant (p>0.05) between two groups. Similar observation was found Choudhary et al.<sup>2</sup> they showed, the right side was operated in 31 patients and the left side was operated in 19 patients. Bukhari and Al-Ammar the monopolar technique was used on the right side in 81 patients and on the left side in 19 patients.<sup>6</sup> In this current study it was observed that mean amount of bleeding was found 36.2±3.8 ml in group A and 76.1±4.1 ml in group B. The difference was statistically significant (p<0.05)

between two groups. Choudhary et al.<sup>2</sup> study observed that the average amount of bleeding on electrocautery side was 37.2±2.46 ml and on the cold dissection side was 83.7±3.37 ml showing a significant lower intraoperative bleeding which is in agreement to other study.<sup>7</sup> Bukhari and Al-Ammar Intraoperative blood loss was minimal with the electrocutery dissection technique, average 25.37 ml (range 0-60 ml). Mann et al<sup>8</sup>, compared blood loss by electrocoagulation method versus dissection method in 95 patients, according to them average blood loss by hot method was markedly less, it was 11.8 ml and in cold it was 66.3 ml for each tonsil separately. In another study by Kujawski had a mean blood loss of 12 ml (SD 18 ml) in the diathermy group and 36 ml (SD 35 ml) in the dissection group.<sup>9</sup> In this series it was observed that mean duration of operation was found 10.6±0.4 minutes in group A and 17.0±0.7 minutes in group B. The difference was statistically significant (p<0.05) between two groups. Choudhary et al.<sup>2</sup> study reported that the mean time of operation on the cauterized part was 11.1±0.39 minutes and on the other side was 18.11±0.65 minutes. Weimert et al.<sup>10</sup> noted a decrease in operative time by using the cautery technique, average 2.5 minutes for the cautery side and 6 minutes for dissection/snare side. Vithayathil et al.<sup>11</sup> study observed there was no difference in the mean operating time between 36.9 minutes for diathermy and 35.9 minutes for dissection groups in a study by Kujawski et al.<sup>9</sup> Bukhari and Al-Ammar showed the mean operation time for monopolar dissection was 3.51 minutes (range 1-12 minutes) and for cold dissection the mean was 4.02 minutes (range 1-15 minutes). The difference was not statistically significant (p>0.05) between two groups.<sup>6</sup> In this present study it was observed that at 1<sup>st</sup> day, 11(11.0%) patients had throat pain in group A and 23(23.0%) in group B. At 2<sup>nd</sup> day, 14(14.0%) patients had throat pain in group A and 25(25.0%) in group B. Which were statistically significant (p<0.05) between two groups. Choudhary et al.<sup>2</sup> showed that postoperatively the patients experience more pain in electrocautery which is similar to the study by Kirazli et al.<sup>12</sup> but differ from Kousha et al.<sup>13</sup> where pain was more in classical dissection method and equal pain was observed in a study by Raut et al.<sup>14</sup> Bukhari and Al-Ammar<sup>6</sup> observed that on the first postoperative day, the pain was significantly increased in the diathermy side compared to cold dissection side 27% versus 12% (p=0.0151). This in the first 24 hours and from the 2<sup>nd</sup> day until the 10<sup>th</sup> postoperative day, there was no significant difference in pain between both sides. Vithayathil et al.<sup>11</sup> there was no significant difference in postoperative pain on the first postoperative day in the diathermy group compared to the cold dissection group (17.5% versus 10%) (p >0.05). Higher pain scores have been reported with electrodissection in studies done by Gendy et al.<sup>15</sup> and Atallah et al.<sup>16</sup> Atallah et al.<sup>16</sup> an increase in pain and a related prolongation of oral intake time in the postoperative period in bipolar cautery tonsillectomy group. Increase in post operative pain in intensity and duration in bipolar diathermy cases; was also observed by Sood & Strachan,<sup>17</sup> and Fiona et al.<sup>18</sup>

## Conclusion

The monopolar diathermy tonsillectomy procedur had less intraoperative bleeding and postoperative pain and it seems to be less time consuming in compare with the dissection tonsillectomy. But patients experience slightly more pain than dissection method.

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