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A Comparison between Dissection and Diathemy Tonsillectomy: Study in a Secondary Care Hospital, Sirajgonj, Bangladesh

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Abstract **Original Research Article**

Background*:** Basically tonsillitis is rapid onset inflammation of the tonsils. It is associated with sore throat, fever, enlargement of the tonsils, troublesome swallowing and large lymph nodes around the neck. Dissection versus diathermy tonsillectomy is two reliable methods in the treatment of tonsillitis. We have a few comparative information between those two different methods. ***Aim of the study*:** The aim of this study was to evaluate the dissection and diathemy tonsillectomy in treating the patients with tonsillitis. ***Methods: This prospective cross sectional study was conducted in the Department of Otolaryngology & Head-Neck Surgery, Sirajganj 250 Bed Bongamata Sheikh Fazilatunnesa Mujib General Hospital, Sirajganj, Bangladesh during the period from January 2018 to December 2019. In total 125 patients of several ages with tonsillitis required dissection or diathemy tonsillectomy were finalized as the total study population. Among total participants in Group I, in 48 patient's diathemy method was applied whereas in Group II in 77 patients dissection procedure was applied. All the data were collected, processed and disseminated by using SPSS version 15.5. ***Result:*** In both the groups the mean hospital staying duration was the same and it was 1 day (SD: ± 0.22). Among both the groups in 9 (18.75%) participants of Group I got any type of post-operative complication whereas it was in 26 (33.77%) participants of Group II. In this study per-operative blood loss for diathermy tonsillectomies ranged from 8 ml to 30 ml, with the average being 15 ml. On the other hand, per-operative blood loss for dissection method of tonsillectomy ranged from 30 to 80 ml, with the average being 45 ml. In dissection-method, needed average time was 16.75 minutes whereas in diathermy procedures it was 24.50 minutes. ***Conclusion:*** In both the procedures post-operative bleeding, pain, fever and infections were the common complications. But difference of the volume of intra-operative blood loss, frequency of complications and needed operating times indicated the superiority of diathermy tonsillectomy over dissection method. Considering these, we found that, the diathemy tonsillectomy is a more effective and safer method than dissection tonsillectomy.

Keywords: Tonsillitis, Dissection method, Diathermy, Tonsillectomy.

INTRODUCTION

Basically tonsillitis is rapid onset inflammation of the tonsils. It is associated with sore throat, fever, enlargement of the tonsils, troublesome swallowing and large lymph nodes around the neck. Dissection versus diathermy tonsillectomy is two reliable methods in the treatment of tonsillitis. Tonsillitis is an inflammation of the pharyngeal tonsils. The inflammation regularly lengthens to the adenoid and the lingual tonsils; consequently, the term pharyngitis might similarly be used [1]. Tonsillitis is an inflammation of the tonsils, characteristically of rapid onset. Symptoms may include throat pain, enlargement of the tonsils, trouble swallowing, large lymph nodes around the neck and fever [2]. Rarely bacteria such as neisseria gonorrhoeae, corynebacterium diphtheriae, or haemophilus influenzae may be the cause. Typically, the infection is spread between people through the air [3]. Confirmation may be throat swab or rapid strep test. Tonsillitis is most commonly caused by a viral infection with about 5% to 40% of cases caused by a bacterial infection [3, 4]. Despite the current availability of randomized clinical trials that have assessed the efficacy of the most common presumed indications for tonsillectomy, controversy still exists not only among physicians, but also among patients & their families. Recurring tonsillitis was observed as a polymicrobial flora containing both aerobic and anaerobic bacteria in core tonsillar cultures in cases with recurrent pharyngitis,

and as many infections, children with recurrent tonsillitis have different populations of bacteria compared to children who have not had [5]. It is a type of pharyngitis [6]. Group A beta hemolytic streptococcal (GABHS) infections are responsible for 15%-30% of all cases of pharyngitis. Patients who have been exposed to GABHS may carry the organisms asymptomatically, even after adequate anti- microbial therapy. Tonsillectomy as treatment of an asymptomatic carrier is desirable when the carrier family has a history of rheumatic fever, has a history of acute glomerulonephritis and the carrier family is having a," PING PONG" spread of disease [7]. Tonsillectomy is frequently accomplished for recurring tonsillitis in young adults, but the opinions differ. A significant improvement in quality of life has been reported in adult patients with recurrent tonsillitis following tonsillectomy [8].

Tonsillectomy is as a part of the surgical management plan has been advocated by some for such pathologies [9]. In fact, tonsillectomy is one of the most frequently undertaken procedures in the otorhinolaryngology. Tonsillectomy is defined because the removal of the whole tonsil. The technique involved scraping the mucus membrane with a finger & enucleating the tonsil. One of the earliest attempts at removal of the entire tonsil was described by Edwin Pynchon in 1890. Ballenger established the capsule as an important surgical milestone in tonsil surgery and activists the elimination of the entire tonsil with the capsule intact [10]. The traditional technique of cold dissection was introduced about 100 years ago. In this method, the tonsils are dissected with metal instruments by blunt dissection. The bleeding could also be controlled by packing the tonsillar fossae with gauze dressings or ligating bleeding vessels [9]. Various advances during this surgical technique have developed with a target of reducing intra-operative bleeding, & subsequent post-operative morbidity. Diathermy technique was first introduced about 40 years ago. Importantly, while diathermy is often used for boot tonsillar dissection & hemostasis, its use may be reserved for hemostasis after a traditional cold steel dissection [11]. Diathermy is electrically induced heat or the utilization of high-frequency electromagnetic currents as a sort of physiotherapy and in surgical procedures. The path way of diathermy was pioneered in 1907 by German physician Karl Franz Nagelschmidt, who devised the term diathermy from the Greek words dia and therma, which means "heating through". French physician and biophysicist Jacques Arsene d'Arsonval and Serbian American engineer Tesla was explored the idea that high-frequency electromagnetic currents could have therapeutic effects independently around (1890-91). d'Arsonval in 1890 first performed of the effect of alternating current on the body and discovered that frequencies above 10 kHz did not cause the physiological reaction of electric shock, but warming [12-17]. There are three unique techniques of diathermy: ultrasound (ultrasonic diathermy), short-wave radio frequencies in the range 1–100 MHz (shortwave diathermy) or microwaves typically in the 915 MHz or 2.45 GHz bands (microwave diathermy), the methods differing mainly in their penetration capability [15].

OBJECTIVES

General Objective

- To dig out a comparative evaluation between dissection and diathemy methods in treating tonsillitis.

Specific Objective

- To assess the age and gender status of the total participants.
- To assess the post-operative complications of the participants.

METHODOLOGY & MATERIALS

This was a prospective cross sectional study and was conducted in the Department of Otolaryngology & Head-Neck Surgery, Sirajganj 250 Bed Bongamata Sheikh Fazilatunnesa Mujib General Hospital, Sirajganj, Bangladesh during the period from January 2018 to December 2019. In total 125 patients of several ages with tonsillitis required dissection or diathemy tonsillectomy were finalized as the total study population. The total patients had been divided in to two groups. In Group I, in 48 patient's diathemy method was applied whereas in Group II in 77 patients dissection procedure was applied. The study was approved by the ethical committee of the mentioned hospital. Before starting the main intervention proper written consents were taken from all the participants. Patients included during this study had a tonsillectomy with either method during this point period, no matter any adjunctive procedures like adenoidectomies, grommet insertion, etc. simultaneously were included in this study. Besides this, the patients with a poor follow-up were excluded from the study. The tonsillectomy by electrocautery was defined as diathermy. These methods were performed with electrocautery dissection (Bipolar) and hemostasis also being achieved by this electrocautery. Dissection method tonsillectomy was distinct as tonsillectomy performed by sharp and dull dissection, hernostasis being acquired with ligature or minimal electrocautery (bipolar). The complications were divided into pen-operative, postoperative and late status. Per-operative complications like, damage to lips tongue pharyngeal wall, TM joint dislocation and bleeding were those occurring during the operation and post-operative complications like bleeding, infections and otolgia occurred immediately after the operation up till 4 weeks. Any complications like, pharyngeal and palatal scarring, tonsillar remanants and voice changes, after 4 weeks were classified as late complications. All data were collected by a pre-designed questioner. Before starting the main intervention proper written

consents were taken from all the participants. All the data were processed by using SPSS version 20.

RESULTS

In this study according to the inclusion and exclusion criteria finally 125 subjects were finalized as the total study population. Among them on 48 participant's diathermy method and on 77 participants, dissection method was applied. In analyzing the age, we found the highest number of patients (41.6%) were from <20 years' age group. Then 28%, 22.4%, and 8% were from 21-40, 41-60 and >60 years' age group respectively. When we analyze the gender we found, in total 52% patients were male whereas 48% were female. We did not find any basic difference between the groups. In the treatment procedure in total 38.4% patients were treated with diathermy method whereas 61.6% were treated with dissection method. Besides these, 6 patients had got both the methods but they were excluded from this study previously according to the exclusion criteria of this study. The mean hospital staying duration was same in both diathermy method and dissection tonsillectomy. In both the groups it was 1 day (SD±0.22). The commonest indications for tonsillectomy in these patients was recurrent tonsillitis. Other indications included quinsy, sleep disorders, tumor of the palate and tumor of the tonsils. Per-operative, post-operative and late complications were evaluated. In total study people among 28% (n=35) participants several post-operative complications were found. Between both the groups 18.75% (n=9) participants of group I got any type of post-operative complication which was 20.8% (n=26) in group II. Among all the complications otalgia was associate in 14.58% in patients of Group I whereas it was 32.47% in Group II. Infections were associated in 8.33% patients of Group I whereas it was 12.99% in Group II. Hemorrhage was associated in 6.25% patients of Group I whereas it was 14.29% in Group II. On the other hand, Vomiting was associated in 4.17% patients of Group I whereas it was 10.39% in Group II. So the safety profile of dissection method is higher than that of diathermy method. A second generation cephalosporin and penicillin were given prophylactically. In comparing diathermy to dissection-method tonsillectomies, several differences were noted. In this study per-operative blood loss in diathermy tonsillectomies ranged from 8 ml to 30 ml, with the average being 15 ml. On the other hand, pen-operative blood loss for dissection method of tonsillectomy ranged from 30 to 80 ml, with the average being 45 ml. Besides these, operative time also differed between the two procedures. In diathermy procedures the needed average time was 16.75 minutes whereas in dissection-method the average needed time was 24.50 minutes.

Image-I: Tonsillitis (Source-Google)

Table-1: Age distribution of patients (N=125)

Age (Year)	Group I		Group II		Total	
	n	%	n	%	n	%
<20	20	41.67	32	41.56	52	41.6
21-40	13	27.08	22	28.57	35	28
41-60	11	22.92	17	22.08	28	22.4
>60	4	8.33	6	7.79	10	8
Total	48	100	77	100	125	100

Table-II: Gender distribution of patients (N=125)

Age (Year)	Group I		Group II		Total	
	n	%	n	%	n	%
Male	25	52.08	40	51.95	65	52
Female	23	47.92	37	48.05	60	48
Total	48	100	77	100	125	100

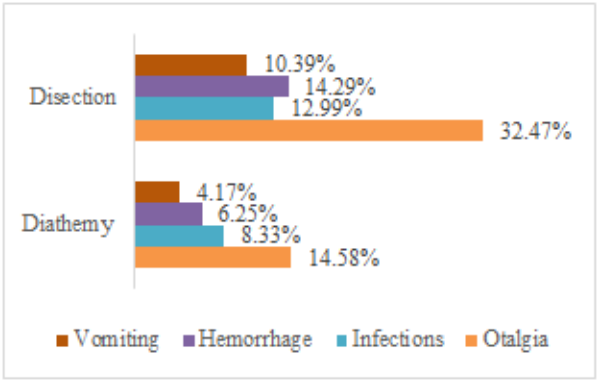

Fig-I: Complications among the participants (N=125)

Fig-II: Average blood loss in both technic (N=125)

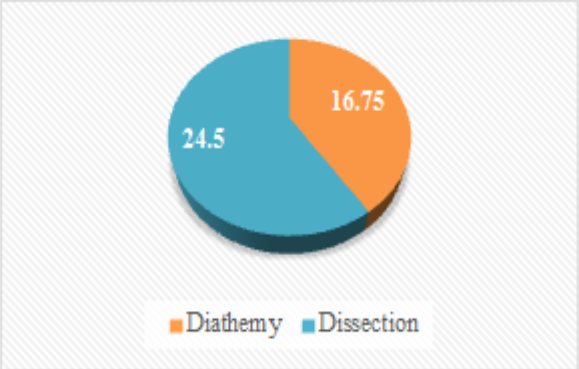

Fig-III: Average blood loss in both technic (N=125)

DISCUSSION

The aim of this study was to evaluate the dissection and diathemy tonsillectomy in treating the patients with tonsillitis. Tonsillectomy has been a standard operation in otolaryngology, with over 1 million tonsillectomies being performed annually in UK within the 1960's and 70's. Although the tonsillectomy may be a quick operation, morbidity could also be significant. Hemorrhage, apnea, pain, fever and poor oral fluid intake are all possible effects of surgery. In this study, the average operative time was 16.75 minutes for diathermy tonsillectomy and 24.50 minutes for dissection method. In another study they stated, the reported intra-operative blood loss with electrocautery ranges from 26.5 ml - 34 ml, while for dissection method it ranges from 76.4-104 ml [18, 19]. The operative time is less with electrocautery, ranging from 11.2-13.5 minutes [10], while it ranges from 12.4-19.9 minutes for the dissection method [20]. All these effects can be minimized in experienced hands and by improving proper techniques. In fact, dissection tonsillectomy is one of several frequently practiced techniques. Dissection tonsillectomy is accomplished by blunt or sharp method, while other modifications of this technique include dissection with electrocautery and laser. These modifications are described the morbidity of the operation. In this study, pen-operative, post-operative and late complications were evaluated. Several post-operative complications were found 28% (n=35) participants. Between both the groups 18.75% participants of group I had any type of post-operative complication, which was only 33.77% in group II. So the safety profile of diathermy method is significantly higher than that of dissection method. The conventional techniques are commonly utilized in most hospitals worldwide because they are doing not require any expensive machines. In experienced hands, both techniques have a negligible incidence of post-operative bleeding. In generally 6-7% postoperative bleedings within 24 hours are found in this mechanical dissection. In the electrocautery technique, post-operative bleeding rates have been reported at between 0-033percent [21]. In this study, per-operative blood loss for diathermy tonsillectomies ranged from 8 ml to 30 ml, with the average being 15 ml. Besides these, operative time also differed between the two procedures. The incidence of postoperative pain is significant after electrocautery but is not as severe after dissection method [22]. In this study it was 15 ml for diathermy and 45 ml for dissection method. There is no consensus on the best technique for a tonsillectomy till now. Although post-operative bleeding, pain, fever and infections are complications of both techniques and have similar incidences, the intra-operative blood loss and time are two important factors which can affect the outcome of both techniques. In our study the diathermy procedure was found as safer and comparatively hassles free than dissection method.

CONCLUSION & RECOMMENDATIONS

In both the procedures post-operative bleeding, pain, fever and infections were the common complications. But difference of the volume of intra-operative blood loss, frequency of complications and needed operating times indicated the superiority of dissection method over diathermy tonsillectomy. Considering these, we found that, the diathemy tonsillectomy is a more effective and safer method than dissection tonsillectomy. This was a single centered study with a small size sample. So the findings of this study may not reflect the exact scenario of the whole nation. For getting more specific results we would like to recommend for conducting similar more studies in several places.

REFERENCES

1. Bhattacharyya N, Kepnes LJ. Economic benefit of tonsillectomy in adults with chronic tonsillitis. Annals of Otology, Rhinology & Laryngology. 2002 Nov; 111(11):983-8.
2. "Tonsillitis" (https://www.ncbi.nlm.nih.gov/pubmedhealth/PMHT0025779/). PubMed Health. Archived (https://web.archive.org/web/20170107031248/https://www.ncbi.nlm.nih.gov/pubmed health/PMH) from the original on 7 January 2017. Retrieved 30 September 2016.
3. Windfuhr JP, Toepfner N, Steffen G, Waldfahrer F, Berner R. Clinical practice guideline: tonsillitis I. Diagnostics and nonsurgical management. European Archives of Oto-Rhino-Laryngology. 2016 Apr 1;273(4):973-87.
4. Strobl EV. Improved causal discovery from longitudinal data using a mixture of DAGs. arXiv preprint arXiv:1901.09475. 2019 Jan 28.
5. Alasmari NS, Bamashmous RO, Alshuwaykan RM, Alahmari MA, Alshahrani AA, Alqarni SA, Alhadlag AS, Alotaibi FA, Alassiri AS, Alnaji AA, Alamri SO. Causes and treatment of tonsillitis. The Egyptian Journal of Hospital Medicine. 2017 Oct 1;69(8):2975-80.

6. "Tonsillitis" (https://www.nlm.nih.gov/cgi/mesh/2016/MB) /web/20160325080921/http://www.nlm. nih.gov/cgi/mesh/2016/MB/cgi from the original on 25 March 2016. Retrieved 4 August 2016.
7. Darrow DH, Siemens C. Indications for tonsillectomy and adenoidectomy. The Laryngoscope. 2002 Aug;112(S100):6-10.
8. Koskenkorva T, Koivunen P, Penna T, Teppo H, Alho OP. Factors affecting quality-of-life impact of adult tonsillectomy. The Journal of laryngology and otology. 2009 Sep 1;123(9):1010.
9. Bailey BJ, Johnson JT, Newlands SD, editors. Head & neck surgery--otolaryngology. Lippincott Williams & Wilkins; 2006.
10. Koempel JA. On the origin of tonsillectomy and the dissection method. The Laryngoscope. 2002 Sep;112(9):1583-6.
11. Scott Browns. Otorhinolaryngology Acute and chronic pharyngeal infection; 2: 1988-1994; 7th ed.
12. Rhees DJ. Electricity-" The greatest of all doctors": An introduction to" High frequency oscillators for electro-therapeutic and other purposes". Proceedings of the IEEE. 1999 Jul;87(7):1277-81.
13. Ho MW, Popp FA, Warnke U. Bioelectrodynamics and biocommunication. World Scientific; 1994.
14. Hand JW. Biophysics and technology of electromagnetic hyperthermia. InMethods of external hyperthermic heating Springer, Berlin, Heidelberg. 1990: 1-59.
15. Dutton M. Physical Therapist Assistant Exam Review Guide. Jones & Bartlett Publishers; 2011 May 11.
16. D'Arsonval A. "Physiological action of currents of great frequency" (https://b ooks.google.com. *Modern Medicine and Bacteriological World*. Modern Medicine Publishing Co. 1893; 2(8):
17. Kovács, Richard. *Electrotherapy and Light Therapy, 5th Ed* (https://archive.org/stream/electrotherapyli00kovrich#page/186/mode/2up). Philadelphia: Lea and Febiger. 1945; 187-188, 197–200.
18. Van Staaij BK, van den Akker EH, Rovers MM, Hordijk GJ, Hoes AW, Schilder AG. Effectiveness of adenotonsillectomy in children with mild symptoms of throat infections or adenotonsillar hypertrophy: open, randomised controlled trial. Bmj. 2004 Sep 16;329(7467):651.
19. Van Staaij BK, Van den Akker EH, Van der Heijden GJ, Schilder AG, Hoes AW. Adenotonsillectomy for upper respiratory infections: evidence based?. Archives of disease in childhood. 2005 Jan 1;90(1):19-25.
20. Wani F, Chisti M, Hamid S, Rehman A, Sangoo M, Hamid S. Redefining indications and evaluation of dissection versus diathermy method of tonsillectomy. Online Journal of Otolaryngology. 2015 Apr 1;5(2).
21. Magdy EA, Elwany S, El-Daly AS, Abdel-Hadi M, Morshedy MA. Coblation tonsillectomy: a prospective, double-blind, randomised, clinical and histopathological comparison with dissection-ligation, monopolar electrocautery and laser tonsillectomies. The journal of Laryngology and Otology. 2008 Mar 1;122(3):282.
22. George A. Gates, Thomas W. Folbre, San Autoni O. Indications for tonsillectomy. Arch Otolaryngol Head Neck Surg. May 1986; 112:501-503.