COMPARATIVE STUDY BETWEEN DISSECTION AND DIATHERMY TONSILLECTOMY.

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Abstract:
Dissection and diathermy are commonly used techniques of Tonsillectomy with quite satisfactory results with either of the two, for which a number of studies have been made many a times all over the world.

However, at our end, another analysis of the results of these techniques was done to find out a procedure which has least peroperative and postoperative morbidity.

A study towards that end was conducted at the departments of Ear, Nose & Throat and Head Neck Surgery, Jinnah post Graduate Centre (from June 1998 to June 2000) and continuation of the study at Baqai Medical University Hospital (from June 2000 to July 2006)

Patients of ages between 13 years and 50 years were selected from the out patient departments of both setups in a randomised fashion. Sample size was 200 patients.

For uniformity sake, one tonsil was dissected followed by ligature homeostasis and the other tonsil of the same patients was removed by daithermy.

It was found that the difference in results between the two techniques was statistically insignificant (P<0.001) in terms of intra operative blood loss and time taken for surgery. Regarding postoperative hemorrhage and post operative pain, the difference between the two was statistically significant (P=0.234) in favour of dissection method.

Hence it is concluded that tonsillectomy with diathermy was a better technique compared to dissection method in terms of intra operative blood loss and time taken for surgery. However it is associated with painful recovery and significantly higher risk of postoperative hemorrhage and therefore can have more morbidity than the dissection method of tonsillectomy.

Keywords: Tonsillectomy, Dissection Vs Diathermy Technique

Introduction:
The first description of tonsillectomy was by Celsius in the first century BC. Tonsillectomy is a classical operation in otolaryngology and the most frequently performed in some industrialized countries. Apart from recurrent tonsillitis, pertonsillar abscess, obstructive sleep apnoea and suspected tonsillar malignancy are common indications of tonsillectomy. Tonsillectomy is a two-stepped procedure. One is to remove the tonsils from the bed and second is to secure hemostasis. Removals of the tonsils can be achieved by different methods for example, dissection with scalpel, scissors, guillotines, lasers, bipolar diathermy and ultrasonic scalpels. These techniques do influence the intraoperative time and postoperative bleeding.

For the purpose of hemostasis, different techniques are used. Ligature of the vessels to stop the bleeding during tonsillectomy was first adopted by Cohen. The use of (monopolar) diathermy in tonsillectomy was first introduced by Haase and Noguera and Johnson. After that Reed and Sinder refined the technique by using bipolar diathermy.

Dissection and diathermy are two commonly used techniques for hemostasis on the tonsillar bed. Both techniques of hemostasis during tonsillectomy have their merits and demerits.

Because of the diversity in opinions regarding efficacy and safety of these two techniques of hemostasis in the international literature, this topic was selected for study to observe the differences in the results of these two techniques taking into consideration intraoperative time, intraoperative bleeding, postoperative pain and frequency of postoperative
hemorrhage.

Importance of the topic selected is also evident with the fact that both of these techniques of hemostasis are frequently practiced and there are no clear cut grounds to prefer one technique over the other. It is merely the surgeon’s choice to use any technique for tonsillectomy. It was therefore necessary to conduct a study in this setting that could assess both of these techniques, their morbidity and outcome and help to evolve a better, safer method of tonsillectomy. Before the start of study I made a null hypothesis that there was no difference between the results of dissection method and diathermy method of tonsillectomy regarding intraoperative time, intraoperative bleeding, post operative pain and the frequency of postoperative hemorrhage.

METHODS

Comparative longitudinal type of study was carried out in the departments of otolaryngology and Head and Neck Surgery JPMC and Fatima Hospital, Baqai Medical University. The study was started in September 1998 and completed September 2000 and continued at BMU Hospital from June 2000 to July 2006. As it was a hospital based study, patients between the ages of 13 and 50 years having a history of recurrent tonsillitis not relieved by medical management were selected in random fashion from the outpatient departments of otolaryngology, JPMC and BMU, and were entered in the study. Operative procedures were conducted in the operation theatre of the department of Otolaryngo and the assessment of main outcome measures was done during the procedure in the opertasion theatre and postoperatively. Silk no. 0 suture was used for the purpose of hemostasis during tonsillectomy by dissection method. Routine surgical instruments were used in the procedure e.g., davis boyle mouth gag, scissors, tonsillar dissectors, negus arteryforceps and straigh artery forceps etc. For collecting the data, a questionnaire was designed and used in the study. Questionnaire was designed in English language and questions were asked in patient’s local language and then after translation, the data was recorded in the questionnaire. Patients were followed up for the assessment after one and two week’s interval at the outpatient department of JPMC and BMU Hospital. The variables or main outcome measures were operative time, intraoperative bleeding, postoperative pain and postoperative bleeding. The operative time was the duration between the insertion of the mouth gag at the end of procedure. Intraoperative blood loss was assessed by measuring the suction bottle content and weighing the swabs that were soaked during tonsillectomy. Postoperative pain was assessed by visual analogue scale and verbal analogue scale. All patients were given same analgesics in standard doses. Postoperative hemorrhage was divided into reactionary and secondary hemorrhage. The data collected from the patients were finally entered into the SPSS version 8.0 for the purpose of analysis. To evaluate the significance of differences in the results, test of significance was applied.

For this, a statistical test knows as ‘Fischer’s Exact Test’ was applied keeping in view the type of data and form and the results obtained.

RESULTS

Out of 200 patients selected for the study, 128 (64%) were males and 36 (36%) were females. The age of patients was between 13 and 50 years. 120 pts were in the range of 13to 20 years (60%). 50 pts were in the range of 21 to 30 yrs (25%). 20 pts were in the range of 31 to 40 yrs (10%). 10 pts were in the range of 41 to 50 yrs (5%).

Regarding operating time for dissection method, the maximum duration of time taken for surgery was 20 minutes and the minimum was 05 minutes. The average was 12 minutes while considering the operating time for diathermy method, the maximum duration of time taken for surgery was 10 minutes and the minimum was 03 minutes. The average was 06 minutes.

The amount of intraoperative hemorrhage by dissection method varies between 50 milliliters to 150 milliliters with an average of 75 ml. The same variable for diathermy method was in the range of 5 ml to 30 ml at an average of 10ml.

Postoperative hemorrhage was classified as reactionary, primary and secondary. The frequency of reactionary, primary and secondary hemorrhage by dissection method tonsillectomy was 8%, 10% and 0% repectively while in diathermy method tonsillectomy, the frequency of reactionary hemorrhage was 0%, and 4% for primary and secondary hemorrhage.

TABLE

As is evident from the tables that the dissection method tonsillectomy is associated with smooth and less painful recovery while the diathermy method although less morbid in terms of intraoperative time and blood loss, is more disturbing and is associated with increased post operative pain.

DISCUSSION:-

Tonsillectomy is one of the most frequently performed surgical procedures in otorhinolaryngology clinics worldwide. Although it is usually performed on the paediatric population, a significant proportion of adults also undergo the procedure. Most commonly it is done in paediatric population for the alleviation of symptoms of recurrent infection sleep apnoea and in adult population the peritonsillar abscess. Other conditions that merit tonsillectomy are unilateral hypertrophied tonsil with a suspicion of malignancy, access to glossopharyngeal nerve for the treatment of glossopharyngeal neuralgia and to the styloid process for eagle’ssyndrome.
Pain and postoperative haemorrhage are the chief elements of post tonsillectomy morbidity. Surgeons are also concerned about the intraoperative time. There is no consensus on the optimum method of performing tonsillectomy. Various methods have been described which are frequently compared and discussed in the literature. Advocates of cold dissection tonsillectomy have presented evidence that this method is less morbid in terms of rapid healing and less postoperative pain as compared with other techniques. This is thought to result from maximum preservation of oral mucosa and minimum damage to tissues when mechanical rather than thermal effects are used for dissection. Healing following a tonsillectomy is by epithelial ingrowth from the incised edges of the anterior and posterior tonsillar pillars. Large tissue defects and thermal damage to the pillar mucosa can thus delay healing and increase the potential for discomfort and late complications. These observations are also made in this study. However these facts were unproven in the study of Raut and colleagues and they recommended the use of bipolar diathermy for tonsillectomy.

Saleh HA and Cain AJ compared these methods of tonsillectomy and found diathermy to be safe and short without causing increased postoperative morbidity. This is in accordance with the results of this study.

In 1993, a study by MG Watson and colleagues revealed that 44% of UK otolaryngologists were found to use diathermy and 56% did not. Those who used diathermy thought it was a fast and safe technique. Those who did not thought it increased postoperative haemorrhage rates and patient morbidity. It was concluded in the study that diathermy is no more likely to result in post tonsillectomy haemorrhage than using ligatures. It was found to be significantly faster method of securing haemostasis and recommended its use in preference to ligature. However they also recommended that the junior surgeons and staff should be taught to tie the ligatures in the tonsillar fossa as situations will arise where bleeding from large vessel or failure of diathermy equipment should therefore cause less tissue damage and the dissection of capsule and the coagulation of vessels in more precise.

Review of all these studies show one common thing that most of the researchers have found using the technique of diathermy more affective and time saving as compared to the other techniques. This is in accordance with the results of this study.

The duration of surgery was shorter in bipolar diathermy tonsillectomy group and can be due to the fact that bipolar diathermy is associated with less amount of blood cozing from the tonsillar fossa as compared to dissection method thus making surgical field relatively clean for the surgeon to perform the procedure quickly and there is reduced need of putting the swabs in the tonsillar fossae and changing them for clarity of vision as is routinely done in dissection method and hence there is lesser duration of time consumed. Because of the fact that the area of coagulation is relatively localized in diathermy, the bleeding vessels can be precisely coagulated.

Now considering results of this study in terms of operative hemorrhage, there was significant difference in the frequency of reactionary hemorrhage and secondary hemorrhage between the two techniques. Primary hemorrhage was seen in 10% pts of dissection method tonsillectomy while the frequency was 4% in patients of diathermy method tonsillectomy. Regarding the incidence of secondary hemorrhage and postoperative morbidity, a Spanish study found no significant difference between diathermy and ligation method. Lassaletta L and Martin G also observed no difference between these two techniques in the incidence of postoperative hemorrhage. Salam MA and Cable in their study found no difference between two procedures in terms of postoperative bleeding. The results of these studies do match with the observations that are made in this study. Likewise some studies conclude dissection technique as a better one regarding the incidence of postoperative hemorrhage comparing diathermy. In a study by Charakorn C, two thousand one hundred tonsillectomies were performed. Different methods of securing post tonsillectomy haemorrhage were considered including suture ligation and diathermy. It was concluded that the use of suture ligature offers an efficient and practical method to reduce the incidence of primary tonsillectomies bleeding. Considering the the intraoperative hemorrhage, it was found that diathermy method tonsillectomy is associated with significantly reduced amount of blood loss as compared to dissection method tonsillectomy. This observation supported by the study showed that the amount of intraoperative blood loss is less as compared to dissection method tonsillectomy.

The increased amount of intraoperative blood loss can be attributed to the fact that during tonsillectomy dissection method, the plane of dissection can be difficult to visualize on part of bleeding or the swabs hampering the vision thus leading injury to the pharyngeal musculature while in bipolar diathermy method, the area of tissue coagulation is localized to that between the fine tips of the diathermy forceps. It should therefore cause less tissue damage and the dissection of capsule and the coagulation of vessels in more precise.

It was assumed in the hypothesis that both the methods of tonsillectomy are equal in terms of intraoperative bleeding and there is no difference between these two techniques. In this way the hypothesis of study was refuted by the results of the two procedures of tonsillectomy.

So closing the discussion it can be stated that the use of diathermy technique of tonsillectomy give satisfactory results in terms of intraoperative blood loss, surgical time but the frequency of postoperative bleeding and the recovery hampered by increased postoperative pain are the factors which should be taken into account before choosing the technique of tonsillectomy.
CONCLUSION:-

On the basis of this study and its results, it can be concluded that diathermy is quicker and associated with low quantity of intraoperative blood loss. Despite these advantages, it has been observed to be associated with morbidities in the postoperative period. The dissection method got an edge over the diathermy method in respect to the postoperative pain and the post operative haemorrhage. Therefore, the selection of surgical technique should be carefully done in accordance with individual's own expertise and the status of care available in hospital setting.

REFERENCES


Chart Showing the Age of Patients (in years) and their respective percentages

- 13-20: 60%
- 21-30: 25%
- 31-40: 10%
- 41-50: 5%

Average Intra Operative Time in Minutes

- 31-40: 10%
- 6-10: 12
- 11-20: 72

Average Intra Operative Haemorrhage in Milliliters

- 75
- 10

Chart Showing Gender of Patients

- Male: 72
- Female: 128