



Guillotine vs. classic dissection adenotonsillectomy: What's the ideal technique for children in Tanzania?



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ARTICLE INFO

Article history:

Received 13 June 2017

Accepted 4 July 2017

Available online 5 July 2017

Keywords:

Adenotonsillectomy

Guillotine

Sluder

Classic dissection

Paediatric

Otorhinolaryngology

Tanzania

ABSTRACT

Objectives: Adenotonsillectomy (ATE) is one of the most performed surgeries in children. Extensive research on which operation technique is the best in terms of minimal pain and complications, operative time and duration of hospital stay is being done mostly in highly resourced developing countries. In developing countries a need for cost effective and time saving operation techniques is essential due to the low-resource setting. This study aims to investigate whether the Guillotine Sluder operation techniques is ideal in a limited resource developing country setting.

Methods: A retrospective cohort study was conducted on children below 12 years of age who underwent ATE at the Kilimanjaro Christian Medical Center, a tertiary hospital in Northern Tanzania, in a period of 2 years to compare the guillotine Sluder and classic dissection ATE techniques. All procedures were done by the same surgeon. Incomplete patient information and congenital syndromes were exclusion criteria for the study.

Results: Both operative time and duration of hospital stay were significantly shorter in the guillotine Sluder group (3,5 min with 95% CI 1,1 to 5,9 min, and 0,4 days with 95% CI 0,2 to 0,6 days respectively). The rate of complications was not statistically different between the two groups. The overall rate of complications was comparable to that of Western countries. No difference was found in mean amount of blood loss during operation.

Conclusions: Our results conclude that guillotine Sluder tonsillectomy is a safe procedure that has some advantages compared to classic dissection in children in Tanzania. The shorter operative time and time in hospital stay combined with the low complication rate makes the guillotine Sluder technique a very suitable technique for children in Tanzania and comparable limited resource developing country settings.

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1. Introduction

Adenotonsillectomy (ATE) is one of the most frequently performed operations in children worldwide and the most frequently performed otolaryngeal operation in children [1,2]. This is also true for Tanzania. Indications for adenotonsillectomy are, amongst others, adenotonsillar hypertrophy, recurrent adenotonsillitis and obstructive sleep apnoea syndrome [1].

Several techniques exist to perform this operation and extensive studies have been done to identify a method with least complications, least postoperative pain and shortest operative time. Classic

or cold steel dissection remains the traditional technique, while electrocautery, coblation, laser and microdebrider represent the modern technology for ATE. The majority of these studies, however, have been conducted in developed countries, such as the USA, UK and the Netherlands [3,4]. It is evident that the Tanzanian health-care system differs greatly from those in developed countries. Besides the fact that most hospitals in Tanzania generally have limited resources, complication rates differ. For example, studies have shown the rate of surgical site infections to be much higher in Tanzania [5,6]. Apart from the differences in healthcare, the characteristics of the Tanzanian population differ from those in developed countries. Living conditions are poorer and there is a much higher rate of communicable diseases such as malaria and HIV infections. Because of these differences, the existing evidence which states that the guillotine Sluder (GS) technique is as good as, or perhaps even better than, classic dissection (CD) is not yet by

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definition applicable to Tanzanian healthcare. In addition, the GS technique appears to have other advantages over the CD technique, such as being time-efficient and cost-effective [7–9]. Advantages that may be of great value in a health care system that is mainly characterized by scarcity. Data about the efficacy and safety of GS adenotonsillectomy in developing countries compared to CD adenotonsillectomy are lacking, but therefore very much needed. This study will be of benefit to comparable care settings in other developing countries worldwide.

The aim of this research is to assess which technique is most appropriate for the Tanzanian situation. We hypothesise that the GS technique is cost effective and time saving while being equally safe as compared to the CD technique. The results of this study may be applicable to comparable limited resource developing country settings.

2. Methods and materials

2.1. Population

To assess the research question, a retrospective cohort study design was chosen. The cohort studied consists of children below the age of 12 years who had an adenotonsillectomy at the Kilimanjaro Christian medical Center, a tertiary hospital in Northern Tanzania, in the period January 2013–February 2015. To prevent bias through level of experience of the surgeon, only the operations done by one single surgeon were eligible. This period was chosen because the surgeon changed his technique of doing ATE in spring 2014 based on the assumption that the GS could have some advantages over the CD technique. Before spring 2014 all patients underwent the CD technique and after that the GS technique was used. Incomplete patient records, ATE not being the only procedure performed or patients suffering from congenital disorder (e.g. Down syndrome) were excluded. The cohort was divided into two groups, based on operation technique. To get a significance level of 0.05 and a power of 80% a total sample size of 250 cases was needed.

2.2. Treatment

All patients were operated under general anaesthesia and with oral intubation. The procedure was performed as described below. After the procedure all patients received the following standard medication: prophylactic antibiotics, either amoxicillin or cloxacillin 125 mg - 250 mg, three times a day for 7 days, diclofenac injection 25 mg - 50 mg, 8 hourly for the first 24 h, paracetamol 250 mg - 500 mg, three times a day for 3 days and ephedrine nasal drops, three times a day for 3 days. Any deviation from this standard protocol was registered.

2.2.1. Guillotine Sluder technique

Patient is put in supine position and covered in sterile draping. A Jennings mouth gag is inserted. Suction is applied throughout the procedure. A Sluder tonsillotomy with appropriately selected blade with respect to the size of the tonsil is introduced into the mouth. The tonsil is pushed through the guillotine fenestra and subsequently the blunt guillotine blade is closed firmly to secure the tonsil. The index finger is then used to bluntly dissect the tonsil in a sweeping motion from the superior to inferior pole. The same procedure is carried out for the contralateral tonsil. Haemostasis is achieved by dry gauze compression. An adenoid curette is used to resect and remove the adenoid tissues. Haemostasis is achieved by dry gauze compression only. All packs are removed and the procedure is concluded once haemostasis is assured.

2.2.2. Classic dissection technique

Patient is in supine position, covered in sterile draping. The neck is extended in Rose position. A Boyle-Davis mouth gag is inserted and the hypopharynx is packed with wet gauze. Suction is applied throughout the procedure. An adenoid curette is used to resect and remove the adenoid tissues. Haemostasis is achieved by dry gauze compression. A mucosal incision is made along the anterior tonsil pillar. Blunt dissection is carried out along the superior to inferior poles of the tonsillar capsule. The tonsil is then removed. Haemostasis is achieved by dry gauze compression and/or electrocautery. The same procedure is carried out for the contralateral tonsil. All packs are then removed and the procedure is concluded once haemostasis is assured.

2.3. Analysis

All analyses were done using *IBM SPSS Statistics 23*. Unpaired t-tests and chi-squared tests were used to determine whether the baseline characteristics of the two groups were comparable. Unpaired t-tests were used to compare duration of the procedure and admission to the hospital. The frequencies of peri- and post-operative complications were calculated and compared using chi-squared tests.

3. Results

Between January 2013 and February 2015 a total of 416 ATE's were performed. Of these, 339 records were retrieved. After the inclusion and exclusion criteria were met a total of 271 cases were obtained and included in the study, amongst which 133 underwent guillotine Sluder and 138 classic dissection ATE.

3.1. Patient demographic

As shown in [Table 1](#), there were no statistically significant differences in gender distribution, age, medical history, surgery indications, pre-operative condition, weight, ASA-score, preoperative haemoglobin levels or grade of tonsil hypertrophy between the GS and the CD groups.

3.2. Outcomes

3.2.1. Operative time and duration of hospital stay

Patients in the GS group had a significantly shorter stay in hospital after their surgery (mean difference 0.4 day, 95% CI 0,2 to 0,6 days) as shown in [Table 2](#). The mean duration of the operation itself and the total procedure time (i.e. total anaesthesia time) were also significantly shorter, namely 2,9 min (95% CI 1,3 to 4,6 min) and 3,5 min (95% CI 1,1 to 5,9 min) respectively. No difference was found in mean amount of blood loss during the procedure.

3.2.2. Peri- and postoperative complications

In the GS group, there were no notable perioperative complications while 2 (1.4%) of cases in the CD group had a perioperative complication. One case of hypotension occurred during the operation with spontaneous recovery and one case of arrhythmia with full recovery after lidocaine administration. These complications were assumed to be related to anaesthesia rather than surgery.

Postoperatively, complications occurred in 2 (1.5%) cases in the GS group and 6 (4.3%) in the CD group. The difference between the two groups was not statistically significant ($p = 0.28$). The most common complications were post-operative bleeding and surgical site infection, as shown in [Table 3](#). Post-operative surgical site infection occurred in 3 cases, all in the CD group. All 3 patients recovered without any additional antibiotic treatment. Post-

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