

A Review and Outcome of Adenoidectomy Performed in Resource Limited Settings

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Abstract Adenoidectomy remains invaluable in alleviating the obstructive symptoms of adenoid enlargement in children. The aim of this study is to review the conventional method of adenoidectomy with a view to establish its role and success in resource limited setting. A 5-year retrospective review of pediatric patients that had adenoidectomy operations done at two tertiary healthcare facilities was conducted. The clinic, ward, theatre registers and the patients' case files were the sources of information. Patients that had adenoidectomy with other otolaryngological procedures were excluded from the study. Data generated were descriptively analyzed using SPSS version 14.0. A total of 71 patients had adenoidectomy done. Of this, 65 cases were reviewed. There were a total of 45 males and 20 females with age range 11 months–10 years. The main indication for surgery was obstructive nasal symptoms. Conventional adenoidectomy was performed with standard adenoid curette. Intra-operative blood loss was less than 60 ml and none of the patients had blood transfusion. The average duration of admission post-operatively was 1.1 day. Fifty-eight (89 %) of the patients were relieved of their obstructive symptoms postoperatively. Conventional curettage adenoidectomy still have a role to play especially in resource limited setting where newer techniques may be nothing but a luxury. Adequate preoperative work-up, good anesthetic and surgical techniques

are sine-qua-none to successful surgical outcome. There is also a need for early referral to otolaryngologists as this will not only ensure optimal intervention but also minimal postoperative complications.

Keywords Conventional · Adenoidectomy · Outcome · Resource limited setting

Introduction

The procedure of adenoidectomy was first performed using a ring forceps through the nasal cavity in 1867 by Williams Meyer [1]. The procedure can be performed alone, or in combination with other surgical procedures like tonsillectomy, placement of tympanostomy tubes especially when the indications coexist [2, 3]. And over the past few decades the procedures have been performed almost exclusively by Otolaryngologists [1, 4–6]. When performed for appropriate indications, it contributes to improvement in the quality of life and at times can help with airway difficulties [7]. The commonest problem pose by adenoid arises when it become enlarged which usually is due to infective process. It has been suggested that allergic disorders also result in adenoidal enlargement. The effects of the enlargement of adenoid can partially or totally obstruct nasal respiration causing snoring, hyponasal speech and forcing the child to breathe through his/her mouth. This produces a characteristic facial appearance called adenoid facie. Hence, infective process and obstruction are the most common major indication for adenoidectomy. Other effects of adenoid enlargement are nasal and ear discharge due to postnasal and Eustachian tube obstruction. The technique of adenoidectomy has undergone many refinements over the years [8]. The various surgical methods that are

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available to surgeons today include conventional cold surgical techniques using adenoid curette/adenoid punch, electrocautery, microdebrider, laser and coblation. In poor resource control economy however, the facilities for newer techniques may not be more than a luxury leaving the practicing otolaryngologists in these areas with no other option than the conventional use of adenoid curette. The aim of this study therefore was to review conventional adenoidectomy among patients seen and treated at two tertiary healthcare institutions with a view to establish its role and success in a developing country.

Methodology

A 5-year retrospective review of pediatric patients that had adenoidectomy operations done at two tertiary healthcare facilities between the periods of June 2005 to May 2011 was conducted. The clinic, ward, theatre registers and the patients' case files were the source of information. Demographic parameters, pre operative presenting complaints and duration as described by their parents, radiological findings, surgical technique, blood transfusion, number of days on admission, intra/post operative complications and post operative outcome and follow up were extracted. The diagnosis of obstructive sleep apnea, made mainly from the history (nasal obstruction, snoring, mouth breathing and apneic spells during sleep) since sleep study/laboratory was not available in most centers, was also noted. Also extracted were the routine biochemical and hematological tests including clotting profile done pre operatively by the patients. Intra operative blood loss, estimated by measuring the volume of blood in the calibrated suction machine and assessment of blood in the soaked gauze were also included in the data. The techniques of anesthesia used for each patient were noted from the anesthetists' charts. Excluded were patients that had tonsillectomy as part of the procedure, those with incomplete data, and patients with co-morbid conditions e.g. nasal septal deviation, cranio facial anomalies. Data obtained were descriptively analyzed using Statistical Package for the Social Sciences (SPSS version 14.0).

Results

A total of 71 patients had adenoidectomy done; data could not be completed on six of them including one patient that died from postoperative cardio-pulmonary arrest (the only mortality recorded), information on the remaining five were not complete, hence 65 records were reviewed. Our patient's age ranged from 11 months to 10 years. The mean age was 3.09 (SD \pm 1.97) with a median of

2.5 years. There were total of 45 males (69.2 %) and 20 females (30.8 %) with a male: female ratio of 2.25:1. The age group 0–2 years was noted to have the highest occurrence of 29 (44.6 %) while age group 6–8 years was the least affected 1 (1.5 %) Table 1.

Twenty six (40.0 %) of our patients presented in our clinic after 24 months of their symptoms, 14 (21.5 %) presented within 18–24 months, 9 (13.8 %) from 12 to 18 months, 12 (18.5 %) from 6 to 12 months while 4 (6.2 %) presented when their symptoms was within 6 months Fig. 1.

The frequencies of the presenting complaints by mothers were: snoring in 59 patients, mouth breathing in 40 patients and Rhinorrhoea in 38 patients. Twenty eight patients had nasal blockage, 17 patients had noisy breathing, 5 had sleep apnoea, and 2 of our patients each presented with otorrhoea and retarded growth. All the patients had pre operative post nasal space radiographs done which showed various degree of narrowing of air passage in the nasopharynx by a mass.

The patients were admitted and reviewed by anesthetists a day prior to surgery. There was no preoperative sedation and peri-operative intubation was achieved with short-acting muscle relaxants. The use of 100 % pre-oxygenation was avoided in those with obstructive sleep apnea. Conventional curette adenoidectomy was performed with standard adenoid curettes and haemostasis was achieved with gauze packing. Forty (61.5 %) patients lost less than 20 ml of blood intra operatively, 23 (35.4 %) lost between 21 and 40 ml while only 2 (3.1 %) patients lost between 41 and 60 ml Fig. 2.

None of the patients had blood transfusion. Postoperative pain was controlled by non-narcotics and non-hypnotics.

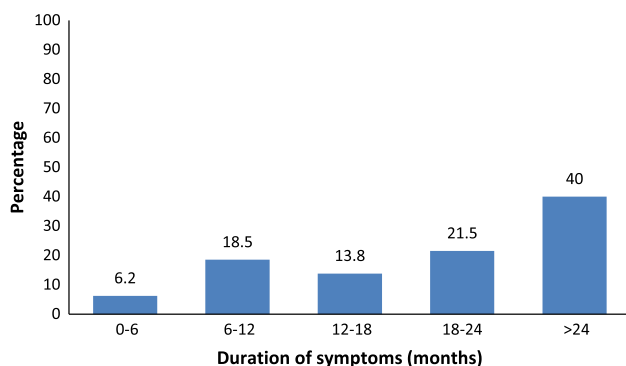
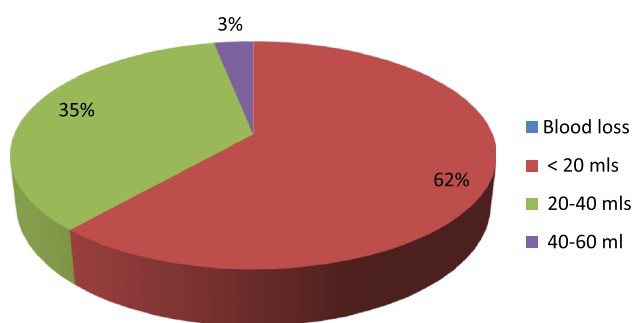
Fifty six (86.2 %) of the patients spent 1 day on admission after operation. Eight (12.3 %) patients stayed 2 days while only one (1.5 %) patient spent 3 days on admission. Records showed that the patients were followed up post operatively for 8–12 weeks depending on their location, to observe for post operative complications and re-evaluation for the pre operative complaints. Only 5 (7.7 %) and 2 (3.1 %) of our patients had postoperative rhinorrhoea and nasal blockage respectively Table 2.

Discussion

Most often, an adenoidectomy is performed in pediatric patients. This study showed that the age range of our patients was from 11 months to 10 years. Some authors reported age group below 10 years in their study [9–11]. This study also showed that the age group 0–2 years has the highest patients with adenoidectomy, while the least affected age group was between 6 and 8 years. This may be

Table 1 Age and sex distribution of patients with adenoidectomy

Age range (years)	Male		Female		Total	
	N	%	N	%	N	%
0–2	21	32.3	8	12.3	29	44.6
2–4	14	21.5	8	12.3	22	33.8
4–6	7	10.8	4	6.2	11	17.0
6–8	1	1.5	0	0.0	1	1.5
8–10	2	3.1	0	0.0	2	3.1
	45	69.2	20	30.8	65	100

**Fig. 1** Showing duration of symptoms**Fig. 2** Showing estimated blood loss

in line with the general view that there is progressive shrinkage in adenoidal size with age especially after the age of 5 and 7 years [12]. The figure of 65 surgeries over a period of 5 years looked small compared to western world and even some institutions within Nigeria. The reasons might be due to the study setting which considered only adenoidectomy as against adenotonsillectomy or other combination in other studies. The location of one of the study centers is in rural area with low income earners who probably could not afford the relatively high cost of surgery in our centre, more so if some of these patients had trivial symptoms that responded intermittently to conservative form of management hence parents did not see the need for surgery. The major/commonest complaints by our

Table 2 Showing pre and post operative symptoms of patients that had adenoidectomy

Symptoms	Preoperative		Postoperative	
	Frequency		Frequency	
	N	%	N	%
Snoring	59	90.8	–	–
Mouth breathing	40	61.5	–	–
Rhinorrhoea	38	58.5	5	7.7
Nasal blockage	28	43.1	2	3.1
Noisy breathing	17	26.2	–	–
Sleep apnea	5	7.7	–	–
Otorrhoea	2	3.1	–	–
Retarded growth	2	3.1	–	–

Multiple symptoms are recorded for some patients. Percentages represent proportion of the study population

patient's pre operatively were snoring, mouth breathing, nasal blockage and noisy breathing. Other complaints are sleep apnea, otorrhoea and growth retardation. These are the complaints usually encountered by otolaryngologist worldwide. It is noteworthy that mothers, in their presenting complaints may use different words to mean the same thing. As noted, some mothers complained of snoring in their children while others complained of noisy breathing. The onus lies on the healthcare givers to see the two symptoms as suggestive of adenoid enlargement and investigate accordingly. Majority (40 %) of our patients' presented to our clinic after twenty four months of development of their symptoms. This presentation to specialist is rather late and it may be due to delay in diagnosis of these patients since most of them usually consult non-otolaryngologist who persistently treat them for recurrent upper respiratory tract infection and nasal obstruction in-lieu of enlarged adenoid. Since adenoid like any other disease, may present with nonspecific symptoms, the healthcare givers must refer soonest to specialists in doubtful cases. A major indication for adenoidectomy in our center from this study was due to hypertrophy obstructive adenoids and in few cases due to infective process. This is similar to studies reported by other authors [12, 13]. Conventional curette adenoidectomy was performed with standard adenoid currettes in all the patients and hemostasis was achieved with gauze packing. Clemens et al. [14], in their study estimated blood loss of 54.5 ml in curettage group as compared to electrocautery ablation group with estimated average blood loss of 3.75 ml. In the present study, forty (61.5 %) of our patients lost less than 20 ml of blood intra operatively and only two (3.1 %) of the patients lost an average of 41–60 ml of blood. Correspondingly, none of our patients had blood transfusion. As a rule of thumb, Richard et al.

[15], suggested avoidance of preoperative sedation and paralysing agents in surgical patients with obstructive sleep apnea. These were the techniques adopted by anesthetists in this study. Also adopted is the avoidance of the use of 100 % pre-oxygenation to prevent wiping off the hypoxic drive in those with obstructive sleep apnea. These in concert with adequate pre-operative work-up contributed significantly to the success of the conventional technique. Also contributing to successful surgical outcome is the control of postoperative pain with non-narcotics and non-hypnotics that have no tendency to depress the respiratory center in those with obstructive sleep apnea. Majority (86.2 %) of our patients spent 1 day on admission post operatively. However, one patient who had post operative aspiration pneumonitis spent 3 days. Day case adenoidectomies had been reported by various authors with good satisfaction [10, 11, 16]. In our patients, the postoperative quality of life was assessed using the preoperative symptoms as indices. These were significantly reduced during follow up visits. As found, only 7.7 and 3.1 % of the patients had rhinorrhoea and nasal blockage post operatively and this may be due to upper respiratory tract infection and allergic conditions. Van den Aardweg et al. evaluated the effect of adenoidectomy in decreasing the number of upper respiratory infections for 2 years following the procedure in children aged 1–6 years, the study did find the prevalence of upper respiratory tract infections decreased over time in both group [17].

Conclusion

Conventional curettage adenoidectomy still have a role to play especially in developing and poor resource control centers where the newer techniques could be nothing but a luxury. Adequate preoperative work up, good anesthetic and surgical techniques are sine-qua-none for successful surgical outcome. There is also a need for earlier referral of patients by our general practitioners and other non otolaryngologists to a specialist since this will not only ensure optimal intervention but also minimal postoperative complications.

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