

Endoscopic adenoidectomy using suction-diathermy ablation in a Nigerian private healthcare institution: A review of 136 cases

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ABSTRACT

Background: Endoscopic-assisted adenoidectomy is a natural progression of a newer technology that allows a more complete adenoidectomy. The most common indication for adenoidectomy is adenoid hypertrophy with obstructive sleep apnea. Techniques and instruments for adenoidectomy have evolved over time, especially with the use of endoscopes, electrocautery, and power-assisted instruments.

This study aims to review the experience with endoscopic power-assisted adenoidectomy, demonstrating its safety and efficacy.

Patients and Methods: This was a cross-sectional study conducted in the Shepherd Specialist Hospital, Sokoto, Nigeria, from January 2018 until November 2023. A preoperative diagnostic rigid nasal endoscopy with a 0° endoscope was done to assess the grade of the adenoid hypertrophy and to help select the candidate for surgery. Statistical analysis was carried out using SPSS version 25.0.

Results: The mean age of the patients was 5.05 ± 1.99 SD. Obstructive sleep apnoea in 54 patients (39.7%), nasal obstruction in 49 (36.0%), and snoring and breathing by mouth in 19 patients (14.0%) were the most common indications for the surgery. Every patient had one or more of these complaints. More males 85 (62.5%) participated in the study than females 51 (37.5%) with a male-to-female ratio of 1.7:1.

Conclusion: Although nasal endoscopes are fast becoming basic tools, powered instrumentation like the microdebrider is not common. The need for special equipment and the cost of the procedure have to be borne in mind. The newer method of endoscopic-assisted powered adenoidectomy was found to be a safe and useful tool for adenoidectomy.

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Introduction

Adenoids are lymphoid tissue located on the nasopharyngeal posterior wall. Adenoid hypertrophy is common in the pediatric population and usually regresses spontaneously before reaching an age in the teens [1]. Nevertheless, sometimes adenoidal hypertrophy may induce a pathological condition, due to choanal space obstruction, Eustachian tube compression, and/or chronic bacterial colonization. For example, adenoidal hypertrophy causing nasal obstruction and recurrent rhinosinusitis, with long-term upper airway obstruction, can lead to maxillo-facial growth alterations and difficulties in physical activity [2]. In some patients, Eustachian tube ostium

closure, with or without bacterial colonization, may cause middle ear effusion with ear fullness or recurrent otitis media, with a subsequent risk in language development and communication [3].

Adenoidal hypertrophy has a definite role in snoring and sleep apnoea [3].

Failure in responding to medical treatment in these pathological scenarios might result in the need for surgical intervention [3].

The advent of endoscopic sinus surgery has popularized the use of intranasal endoscopes. Endoscopic-assisted adenoidectomy is a natural progression of a newer technology that allows a more complete adenoidectomy. Adenoidectomy is a

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commonly performed procedure in the field of otolaryngology–head and neck surgery [4].

Adenoidectomy may be done alone or with tonsillectomy. The most common indication for adenoidectomy is adenoid hypertrophy with obstructive sleep apnea [5]. Other indications are recurrent otitis media with effusion, nasal obstruction, and sinusitis. Adenoid tissue serves not only as an obstruction to the upper airway in sleep-disordered breathing but also as a reservoir for bacteria, which may contribute to recurrent episodes of otitis media and sinusitis [5]. Techniques and instruments for adenoidectomy have evolved over time, especially with the use of endoscopes, electrocautery, and power-assisted instruments. All these developments aim at better hemostasis, clearer visualization of the nasopharyngeal region of a child, shorter operative time, and less postoperative pain [6].

However, despite improvements in the techniques, complications related to the procedure are often inevitable. Major complications include primary and secondary hemorrhages, while minor complications include fever, soreness, neck stiffness, and postoperative pain [7].

There are many different adenoidectomy methods. The conventional adenoidectomy is performed with the transoral approach and can be accomplished with an adenoid curette, adenotome, St. Clair-Thompson forceps, adenoid punch, electrocautery curette, suction electrocautery, CO₂ laser, or a combination of these instruments [8]. One can instead use a transnasal approach with an adenoid punch, cutting and biting forceps, or electrocautery, in conjunction with transnasal telescopic visualization. A combined transoral and transnasal approach can also be used [9]. One of the newest adenoidectomy techniques is endoscopic transnasal adenoidectomy utilizing a powered microdebrider or suction diathermy. This instrument uses a powered rotating blade within a suction device so that it debrides only loose soft tissue, which can be aspirated into the device [2,10].

Suction diathermy adenoidectomy aims to remove adenoids with minimal blood loss. It uses heat generated by electric current to ablate adenoid tissues. The initial setup is similar to that for the conventional adenoidectomy with the mouth opened with the Boyle–Davis gag and suspended with Draffin rods. Nasal catheters are inserted into the nose to retract the soft palate. The adenoid is visualized with a 0° 2.7-mm endoscope. A malleable suction diathermy probe is passed through the mouth and applied to the adenoid tissue. It is slowly

moved to remove adenoid tissues until the posterior choanae are visible. An alternative method to the use of a 0° 2.7-mm endoscope for visualization of the nasopharynx is to use a transoral 45° endoscope connected to a monitor [11–13].

Advantages of this technique include minimal blood loss and postoperative hemorrhage rate, while limitations include possible thermal injury to surrounding structures and no histological specimens obtained [10,14,15].

The aim of this study is to review the experience with endoscopic power-assisted adenoidectomy, demonstrating its safety and efficacy.

Methodology

This was a cross-sectional study conducted in the Shepherd Specialist Hospital Sokoto, Nigeria. After obtaining approval of this study by the institutional medical ethics committee, from January 2018 until November 2023, 136 children in the age group of 2–14 years undergoing adenoidectomy were included. Written informed consent from the parents and assent from the children were obtained.

Patients included in the study were those with complaints about and who fulfilled the clinical criteria for adenoidal hypertrophy. Patients with Down's syndrome, craniofacial malformations or submucous cleft or with contraindications to general anesthesia, and those who failed to report for regular follow-up during the period of study were excluded from the study.

All patients with adenoid hypertrophy underwent thorough history taking and clinical examination, and those who qualified for surgical management and satisfied the inclusion criteria underwent endoscopic power-assisted adenoidectomy.

A preoperative diagnostic rigid nasal endoscopy with a 0° endoscope was done to assess the grade of the adenoid hypertrophy and to help select the candidate for surgery. It also ruled out any nasal pathology. Nasal endoscopy is the gold standard diagnostic technique to evaluate the adenoid size, inflammatory and infectious status, and its anatomical relationship with the nasopharyngeal orifice of the Eustachian tubes. Careful history taking and examination of the oropharynx was done, and the tonsillar enlargement was noted and graded. Impedance audiometry was recorded for the patients selected for the study to rule out Eustachian tube obstruction.

Rigid nasal endoscopy is the chosen method to assess the grade of adenoids. Statistical analysis was

carried out using SPSS version 25.0 (IBM SPSS, US) software with regression modules installed. Data were analyzed using percentage and ratio analysis with suitable diagrams and chi-square test.

Result

One hundred and thirty-six patients underwent adenoidectomy using suction diathermy ablation under endoscopic guidance from January 2018 to November 2023. Complete removal and hemostasis were confirmed by endoscopic examination. Age ranged from 1 to 15 years with a mean age of 5.05 ± 1.99 SD (Table 1). More males, 85 (62.5%), participated in the study than females, 51 (37.5%), with a male-to-female ratio of 1.7:1 (Fig. 1). Figure 2 demonstrates the various indications for adenoidectomy, with obstructive sleep apnoea in 54 patients (39.7%), nasal obstruction in 49 patients (36.0%), and snoring and breathing by mouth in 19 patients (14.0%) being the most common indications for the surgery. Other indications were recurrent otitis media and otitis media with effusion 8 (5.9%), and recurrent upper airway infections 6 (4.4%). Every patient had one or more of these complaints. Preoperative adenoidal

Table 1. Age categories of the patients.

| Age category of the patients | | |
|------------------------------|---------------|----------------|
| Age range | Frequency (n) | Percentage (%) |
| 1–5 | 94 | 69.1 |
| 6–10 | 37 | 27.2 |
| 11–15 | 5 | 3.7 |

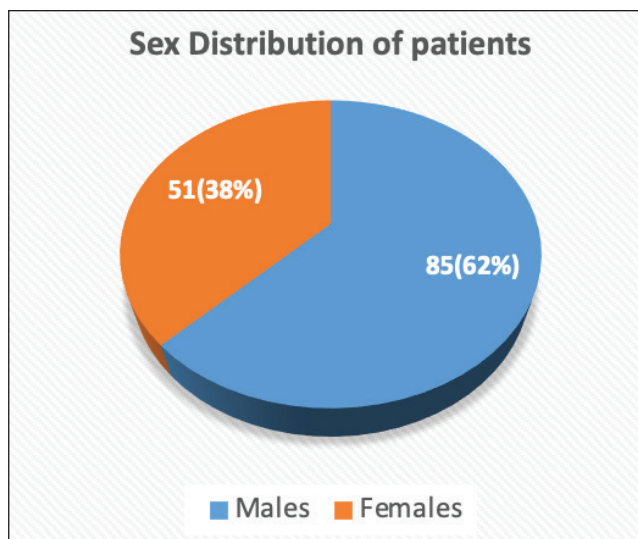


Figure 1. Sex distribution of patients.

size on flexible endoscopy ranged from 60% to 99% obstruction to the posterior choana.

Table 2 highlights other surgeries performed together with endoscopic adenoidectomy, which include tonsillectomy 80 (58.8%), turbinoplasty 9 (6.6%), myringotomy, and functional endoscopic sinus surgery, each 6 (4.4%), and 33 patients (24.3%) had adenoidectomy only.

All the patients started a normal diet within 72 hours after surgery and returned to normal activities within a week. Complete airway patency and no remnant of adenoids were seen in all patients assessed by endoscopic evaluation at follow-up.

Discussion

Adenoidectomy is one of the most commonly performed otorhinolaryngological operations in children. The surgical technique used can have a substantial impact on the intraoperative bleeding, postoperative pain, and the recovery time. Also, complications like nasopharyngeal stenosis and Eustachian tube stenosis, though infrequent, are difficult to handle if they occur [1].

Several techniques for adenoidectomy exist, and their relative effectiveness is debated. Surgeons should select the technique that, in their own hands, offers the minimum morbidity. It is of very much importance for the surgeon to ascribe special attention to the safety, accuracy, and outcomes when choosing among different surgical techniques due to the large number of adenoidectomies performed. It is difficult to access the extension of the adenoid into the posterior nasal choana by a conventional method, and hence, techniques that enable direct vision and handling are useful to improve the field of visualization. Remnant adenoid tissue may be left behind with a risk of re-growth, which may lead to symptom persistence in the form of snoring or recurrent otitis media.

Skilbeck et al. [14] reported limitations of suction diathermy adenoidectomy to include inability to perform histological analysis of the surgical specimen, thermal injury to adjacent tissues.

The mean age of all the 136 patients was 5.05 ± 1.99 years, as against the 8.7 ± 2.3 years reported by Singh et al. [8] and 6.34 ± 2.22 years reported by Saibene et al. [3].

Obstructive sleep apnoea was the most common indication for adenoidectomy followed by nasal obstruction. Somani et al. [1] reported nasal obstruction as the most common indication for adenoidectomy, Jonas et al. [12] also reported nasal obstruction,

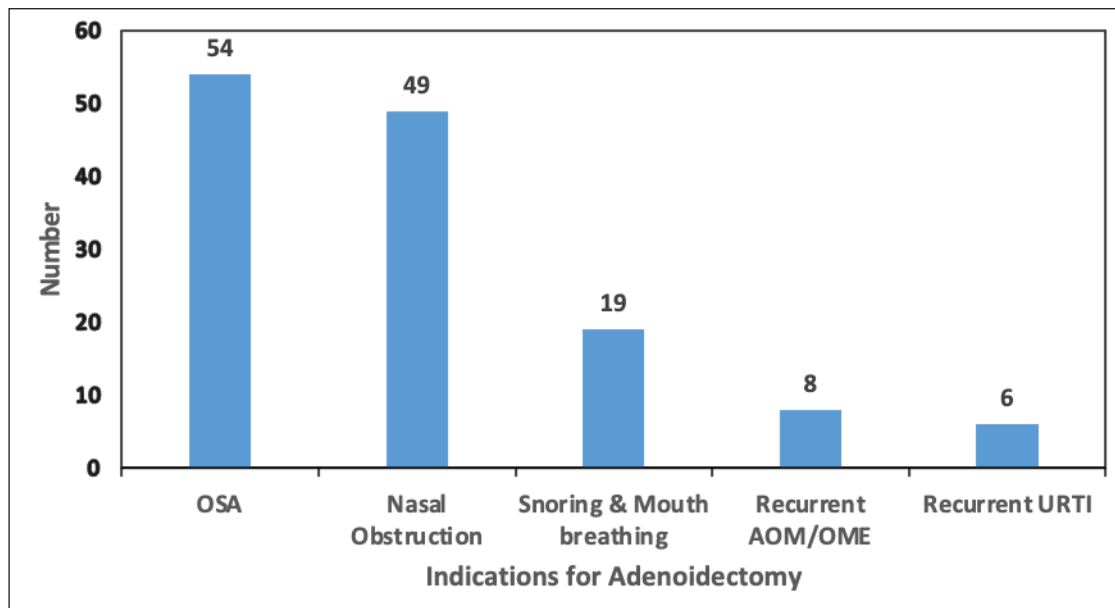


Figure 2. Indications for adenoidectomy.

Table 2. Associated surgeries performed along with adenoidectomy.

| Associated surgeries | Frequency (n) | Percentage (%) |
|---------------------------|---------------|----------------|
| Tonsillectomy | 80 | 58.8 |
| Turbinoplasty | 9 | 6.6 |
| Myringotomy | 6 | 4.4 |
| FESS | 6 | 4.4 |
| Choanal atresia resection | 2 | 1.5 |
| None | 33 | 24.3 |

and obstructive sleep apnoea as common indications for adenoidectomy [12]. Bipolar suction diathermy use for both hemostasis and dissection in adenoidectomy patients in our study increased the duration of postoperative pain, and postoperative analgesic medication was also significantly prolonged. This might be because electro-surgical incisions tend to produce more tissue destruction and an inflammatory response when compared to the traditional curettage method. Veronica et al. [11] reported increased postoperative pain, increased duration of analgesic administration, nasal obstruction, and malodor as some of the problems associated with electrocautery for adenoidectomy. Endoscopic adenoidectomy with either microdebrider, coblation, or bipolar suction diathermy, future research directions are toward robotic surgeries.

Conclusion

Although nasal endoscopes are fast becoming basic tools, powered instrumentation like microdebrider is not common. The need for special equipment and the cost of the procedure have to be borne in mind. Bipolar suction diathermy should be used with caution during adenoidectomy, it stops bleeding, and the risk of postoperative bleeding is negligible but causes significant pain after surgery. The advantages of this technique include completeness of resection and accurate removal of adenoidal tissue.

Limitations of the study

The study was a single center study and there is no long-term follow-up.

Conflict of interest

The authors declared no conflict of interest.

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