

# Microdebrider-assisted powered adenoidectomy: a prospective study

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Received 3 September 2018

Accepted 12 November 2018

The Egyptian Journal of Otolaryngology  
2019, 35:37–40

## Objective

To assess the use of powered instrumentation and endoscopes to evaluate the efficacy and safety of this procedure in comparison to classic adenoidectomy using an adenoid curette.

## Patients and methods

A prospective study performed at the Department of Otolaryngology, Head and Neck Surgery in Jazan General Hospital, Kingdom of Saudi Arabia. It includes 70 patients subjected to adenoidectomy who were divided into two equal groups: conventional curette adenoidectomy (CCA) group and microdebrider-assisted powered adenoidectomy (MPA) group. Both groups were assessed for operative time, average operative blood loss, duration of postoperative pain, return to normal diet and activities.

## Results

There was no statistical significance between two groups regarding the operative time: the mean operative time in the CCA group was 13.7±3.5 min, while 12.9±4.3 min in the MPA group. The mean operative blood loss in the CCA group was 14.2±3.4 ml, while it was 13.5±2.9 in MPA group without any statically significant difference between the two groups.

## Conclusion

MPA proved to be a good alternative to CCA technique as both techniques provide complete adenoid resection with fewer traumas to the adjacent tissue. Level of Evidence: 3b.

## Keywords:

adenoid, adenoidectomy, hypertrophy, microdebrider, nasal obstruction

Egypt J Otolaryngol 35:37–40

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1012-5574

## Introduction

Adenoid tissue is considered as a part from the Waldeyer's ring as lymphoid structures and is located at the uppermost part of the nasopharynx, next to the Eustachian tube and choana [1]. Adenoid hypertrophy or chronic adenoiditis may cause significant problems requiring adenoidectomy especially when nasal obstruction is occurred [2]. Conventional adenoidectomy is performed using adenoid curettes. There is a tendency for residual adenoid tissue as postoperative complications such as hemorrhage, velopharyngeal insufficiency, nasopharyngeal stenosis, and nasal obstruction due to regrowth of the adenoid tissue [3]. The microdebrider was introduced in the endoscopic sinus surgery. It is a device with a rotary shaving mechanism with continuous suction, which cuts and extracts soft tissue through the side port of its blunt cannula [4].

The microdebrider is potentially useful in adenoidectomy with less residual adenoidal tissue especially when use with endoscopes to guide dissection in adenoidectomy to assist in complete removal of the adenoids [5]. The aim of this study is to assess the use of powered instrumentation and

endoscopes and to evaluate the efficacy and safety of this procedure in comparison to classic adenoid-curette adenoidectomy (ACA).

## Patients and methods

A prospective study was carried out in the Otolaryngology Department in Jazan General Hospital, Kingdom of Saudi Arabia from 2012 to 2017. The study included 70 children subjected to adenoidectomy (age ranged from 2.3 to 9.7 years, mean 5.6±2.1 years). These patients had symptoms of nasal obstruction, snoring, mouth breathing, hyponasality, and nasal discharge.

All patients were subjected to history taking for personal data and nasal complaints. Complete otolaryngology examination included assessment of the adenoids endoscopically, using 2.7 and 4 mm rigid nasal endoscopes, tympanometry evaluation to

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the ears and lateral radiograph view of the nasopharynx to assess the size of the adenoids. We exclude patients with craniofacial anomalies, otitis media with effusion, subjected to associated tonsillectomy, bleeding tendency, unfit for general anesthesia, and previous adenoidectomy. Preoperative testing (complete blood cell count and coagulation profile) and anesthesia consultation were accomplished.

The patients were divided into two equal groups randomly prior to the start of the study. Opaque envelopes were numbered sequentially from 1 to 70. A computer-generated table of random numbers was used for treatment assignment: if the last digit of the random number was from 0 to 4, a note was placed into the envelope specifying conventional curette adenoidectomy (CCA), while if the last digit was from 5 to 9, the note specified to microdebrider-assisted powered adenoidectomy (MPA).

Both techniques were done under general anesthesia with the patient in the supine position (Rose position) on the operating table through a transoral endotracheal tube.

A Crowe–Davis mouth gag was used and the soft palate was palpated to identify a submucosal cleft and then catheters were passed through the nose and into the oropharynx providing more exposure to the nasopharynx. Assessment of the size of the adenoid tissue and exclusion of an aberrant or dehiscent internal carotid artery by examining the nasopharynx with a dental mirror and/or by digital palpation was performed.

#### Conventional curette adenoidectomy technique

We choose the largest adenoidectomy curette that fits easily in the nasopharynx and using a mirror to place the curette under direct vision for removal of the adenoid with a single firm scraping motion from superiorly to inferiorly then the adenoid bed was inspected to achieve complete removal and hemostasis.

#### Microdebrider-assisted powered adenoidectomy technique

Disposable cannula of the endoscopic shaver was then bent 45° into the curvature required for the adenoidectomy connected to the suction tubing and continuous suction mode is turned on. Resection is performed in a side-to-side manner and the tip of the oscillating cannula is kept always under direct vision. The adenoid tissue is collected in a sock seated in a pediatric graduated vacuum bottle and then the adenoid bed was inspected to achieve complete removal and hemostasis.

Adenoidectomy procedure for both groups is performed as a day-care surgery. Paracetamol is usually sufficient to control postoperative pain. The patients are advised to miss school for 5 days and generally recover within a week. Both groups were assessed for operative time, average operative blood loss, duration of postoperative pain, return to normal diet and activities, and finally for recurrence of adenoid using nasal endoscopy for 12 months.

#### Statistical analysis

Data collected were processed using SPSS, version 21 (SPSS Inc., Chicago, Illinois, USA). Quantitative data was expressed as mean±SD while qualitative data was expressed as numbers and percentages. The Student *t*-test was used to compare the significance of difference for quantitative variables that follow normal distribution.

#### Ethical consideration

Written informed consent was taken from the patients' first degree relatives of, for example, parents. The local ethics committee approved the study.

#### Results

Seventy (46 men and 24 women) patients fulfilling the inclusion criteria for adenoidectomy were included in our study who were divided randomly into two equal groups. In the CCA group, 35 patients were subjected to adenoidectomy using the standard CCA technique as a control group, while in the MPA, the patients were subjected to adenoidectomy using the MPA technique as a study group.

The main presenting symptom in most of the patients was nasal obstruction in all patients (100%), followed by mouth breathing in 87%, snoring in 81%, and nasal discharge in 73%. Hearing impairment occurred in 20% of the cases, persistent cough in 10%, nocturnal enuresis occurred in 10%, and obstructive sleep apnea occurred in 3% of the cases (Table 1).

**Table 1** The distribution of symptoms among patients in both groups

Symptoms	N (%)
Nasal obstruction	70 (100)
Mouth breathing	61 (87)
Snoring	57 (81)
Nasal discharge	51 (73)
Hearing loss	14 (20)
Persistent cough	7 (10)
Nocturnal enuresis	7 (10)
Obstructive sleep apnea	2 (3)

The finding revealed that the most frequent signs were postnasal discharge in 41%, followed by adenoid facies in 26%. Tympanic membrane retraction was observed in 14% and the least occurred sign was hypertrophied inferior turbinate in 6% (Table 2). There was no statistical significance between two groups regarding the operative time. The mean operative time in CCA group was  $13.7 \pm 3.5$  min while  $12.9 \pm 4.3$  min in the MPA group. The mean operative blood loss in the CCA group was  $14.2 \pm 3.4$  ml while it was  $13.5 \pm 2.9$  in the MPA group. These results were statically not significant. Regarding the duration of postoperative pain, the CCA group showed pain postoperatively with a mean duration for  $2.9 \pm 0.6$  days while it was  $3.1 \pm 0.9$  days in the MPA group and these results were also statically not significant.

Finally regarding return to normal diet and ordinary activities, the CCA group returned after  $3.1 \pm 0.3$  days while it was  $3.3 \pm 1.1$  days without any statistical significant. Follow-up of both groups using endoscopic examination revealed complete removed for the adenoids without any residual or damage to the surrounding structures.

## Discussion

Adenoid hypertrophy is a common cause of upper airway obstruction in children and in severe cases may result in cor pulmonale, pulmonary vascular hypertension, and alveolar hypoventilation, all of which may be reversed by adenoidectomy which still is one of the most frequently performed operation especially in children [6]. The adenoid curette does not have the control needed to provide complete resection of adenoid tissues. Although, it has good results but being performed blindly has its own demerits, the most important being bleeding [6].

The power instrumentation is a precise and safe method, because the visualization by endoscope will result in complete resection of adenoid tissues around torus tubarius without the fear of traumatizing the surrounding tissue. The tubal orifice complications were difficult to assess immediately postoperatively as tubal fibrosis may take a variable duration to

occur, due to this a longer follow-up with tympanometry is recommend [7]. The microdebrider has been used extensively for tissue debridement during endoscopic sinus surgery and with endoscopic-assisted adenoidectomy with microdebrider good results have been achieved. Due to suction and shaving action of the microdebrider, it can remove the tissue down to the less vascular fascial plane. Oscillation cutting action of the blade minimizes the bleeding [8].

Koltai *et al.* [9] found that powered-assisted adenoidectomy (PAA) was significantly faster than ACA in about 8 min less. This was supported by Stanislaw *et al.* [10], as the operative time in the PAA group was 10 min 16 s while in the ACA group it was 12 min and 56 s. In our study, the operative time was not significantly faster. We found that there is no significant difference between two groups regarding blood loss and it was the same finding in other related studies. Koltai *et al.* [9] stated that the blood loss was 22 ml in the PAA group and 32 ml in the ACA group. Stanislaw *et al.* [10], concluded that the blood loss in the PAA group is 27% less than in the ACA group in contrast to Rodriguez *et al.* [11].

There were no injuries to the surrounding structures within the nasopharynx in both groups. There was no statistical difference between CCA and MPA in regard to the incidence and duration of postoperative pain, as well as the time it took for the patients to return to regular diet and activities and this was similar to the result of the other relevant study [10]. Koltai *et al.* [9] mentioned that the use of an angled microdebrider shaver blade could be used in the nasopharynx under mirror visualization to allow complete removal of the adenoid tissue and suction diathermy is used to obtain hemostasis. The main disadvantages of the microdebrider are the increased costs due to the use of disposable instrumentation and the specimens gained by power-assisted instrumentation are too traumatized to provide the microscopic details necessary to make histopathologic diagnosis in suspected cases. To achieve proficiency with the technique more experience is required [12].

**Table 2** The distribution of signs among patients in both groups

Signs	N (%)
Postnasal discharge	29 (41)
Adenoid facies	18 (26)
Tympanic membrane retraction	10 (14)
Hypertrophied inferior turbinate	4 (6)

## Conclusion

MPA proved to be a good alternative to CCA technique as both techniques provide complete adenoid resection with fewer traumas to the adjacent tissue.

## Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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