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Efficacy and Safety of Endoscopic Assisted Adenoidectomy in Children

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ABSTRACT

Background: One of the most frequent surgical procedures performed on children is an adenoidectomy. In last decades, there has been a shift away from cold treatments and toward electrosurgical treatments. The aim of this study was complete removal of adenoids and reducing complications of conventional curettage adenoidectomy by using endoscopic-assisted adenoidectomy. **Patients and methods:** This was a randomized prospective clinical trial. This study included 54 patients with hypertrophied adenoiditis who were scheduled for adenoidectomy in otolaryngology Head and Neck Surgery department at Zagazig University Hospitals. Group I 27 patients underwent adenoidectomy through endoscopic-assisted microdebrider (group 1) and 27 patients underwent adenoidectomy through endoscopic-assisted coblation (group 2). A detailed history was obtained during the time of admission, and a complete ear, nose and throat examination was done in all patients. An X-ray nasopharynx lateral view soft tissue exposure or diagnostic nasal endoscopy was done to confirm the diagnosis. The details were obtained from the out-patient and in-patient medical records. **Results:** The mean operation time in all endoscopic adenoidectomy was 27.22 min ±8.61. Post-operative complications was postoperative bleeding in 3 (5.6%) cases, local infection in 3 (5.6%) cases, AOM in 3 (5.6%) cases, postop voice change in 6 (11.1%) cases, Ear pain in 4 (7.4%) cases, neck pain in 3 (5.6%) cases, halitosis in5 (9.3%) cases, torticollis in 5 (9.3%)cases and fever in 4 (7.4%) cases.There was no statistically significant difference between both groups regarding post-operative complications. **Conclusion:** Both coblation and microdebrider adenoidectomy provide distinct advantages over traditional methods. One obvious benefit of coblation over microdebrider is the need for only one instrument, rather than necessitating a microdebrider and an electro-cautery device for hemostasis. However, the reduction of intraoperative time achieved by microdebrider is associated with less complications and cost.

Keywords: adenoidectomy; endoscopic assisted; coblation; microdebrider

Introduction

Adenoid, an essential part of the lymphoid system, is located in the superoposterior region of the nasopharynx and affects breathing in the upper airway. It forms the uppermost limit of Waldeyer's ring. It is well known that, in general, the adenoids are small at birth and gradually grow over the course of several years after birth as a result of the immune system's hyperactivity **(1)**.

One of the most frequent surgical procedures performed on children is an adenoidectomy and indicated for otitis media with effusion or chronic otitis media

and symptoms include nasal obstruction, mouth breathing, snoring, and hearing loss. Adenoidectomy, which ranks third among ambulatory procedures after tonsillectomy and grommet insertion, is one of the most common pediatric procedures performed worldwide **(2).**

In last decades, there has been a shift away from cold treatments and toward electrosurgical treatments such as electrocautery and also the rise of innovative instruments like coblation and microdebriders **(3).**

Coblation has proven to be a popular adenoidectomy procedure. Several writers have stated that coblation has major advantages over other treatments, claiming that because it operates at lower temperatures than diathermy, it may cause less tissue damage, minimise postoperative pain and bleeding, and aid healing **(4)**.

The aim of this study was complete removal of adenoids and reducing complications of conventional curettage adenoidectomy by using endoscopic-assisted adenoidectomy.

Patients and methods

This was a randomized prospective clinical trial. This study included 54 patients with hypertrophied adenoiditis who were scheduled for adenoidectomy in otolaryngology Head and Neck Surgery department at Zagazig University Hospitals. Group I 27 patients underwent adenoidectomy through endoscopic-assisted microdebrider (group 1) and 27 patients underwent adenoidectomy through endoscopic-assisted coblation (group 2).

Inclusion criteria was patients in childhood period aged between 3 and 15 years old who are diagnosed to have hypertrophied adenoiditis (Patients with nasal blockage, mouth breathing, snoring, and frequent sinonasal infections were also included in the study. The patient's history and nasopharyngeal endoscopy confirmed the diagnosis of adenoid hypertrophy)

A detailed history was obtained during the time of admission, and a complete ear, nose and throat examination was done in all patients. An X-ray nasopharynx lateral view soft tissue exposure or diagnostic nasal endoscopy was done to confirm the diagnosis. The details were obtained from the out-patient and in-patient medical records.

Operation time was defined as the time between the formal start and end of the operation. Intraoperative blood loss included the volume of blood in the aspirator and the number of cotton pieces used for soaking up blood during the operation, wherein a blood volume of 1 ml was counted for each cotton piece.

The pain VAS is self-completed by the respondent. The respondent is asked to place a line perpendicular to the VAS line at the point that represents their pain intensity. A higher score indicates greater pain intensity. Based on the distribution of pain VAS scores in postsurgical patients (knee replacement, hysterectomy, or laparoscopic myomectomy) who described their postoperative pain intensity as none, mild, moderate, or severe, the following cut points on the pain VAS have been recommended: no pain (0), mild pain (1-3), moderate pain (4-7), and severe pain (7-10) **(Figure 1)**.

Statistical analysis:

Data collected and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) software for analysis. According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean ± SD. Differences between quantitative independent multiple by ANOVA. P-value was set at <0.05 for significant results &<0.001 for high significant result.

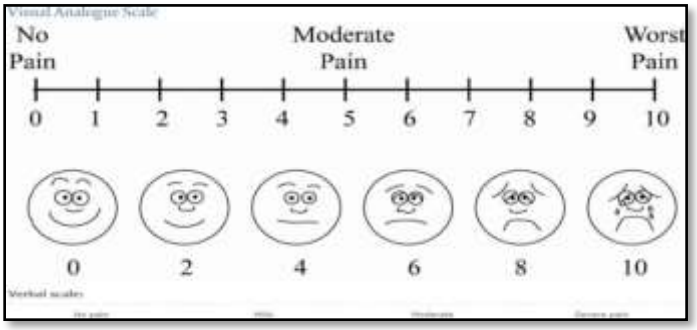

Fig. (1) : Visual analogue scale.

Results

The mean age was 7.15 years in all cases and 25 (46.3%) of them were males. Most of cases (68.5%) were grade 3 adenoiditis according to Clemens and McMurray scale **(Table 1)**.

The mean operation time in all endoscopic adenoidectomy was 27.22 min ±8.61. The intra operative complications was collateral injury in 3 cases (5.6%) and iintra-operative bleeding in 6 (11.1%) cases of microdebrider group where bipolar was used for hemostasis **(Table 2 &Figure 2)**.

Operation time was significantly lower in group 1 (microdebrider) than group 2 (coblation) which was 20.19 min in average in group 1 and 34.26 min in group 2 (p <0.0001). Postoperative pain scores as assessed by VAS score 1 day significantly higher in Group 1 (microdebrider) as compared to Group 2 (coblation) postoperative (P <0.0001). There was no statistically significant difference between both groups regarding post-operative complications **(Table 3)**.

Table (1): clinical data among the studied cases:

Patients properties		Mean ±SD / n (%)
Age		**7.15 ±2.93**
Sex	**female**	**29 (53.7%)**
	male	**25 (46.3%)**
Adenoid grading	**Grade 2**	**8 (14.8%)**
	Grade 3	**37 (68.5%)**
	Grade 4	**9 (16.7%)**

Table (2): Operative & data among the studied cases

All cases (n=54)		
Operative time		**27.22 ±8.61**
Intra operative complications	**Collateral injury**	**3 (5.6%)**
	Intraop. bleeding	**6 (11.1%)**
	postoperative bleeding	**3 (5.6%)**
Post-operative complications	**Local infection**	**3 (5.6%)**
	AOM	**3 (5.6%)**
	Postop voice change	**9 (16.7%)**
	Ear pain	**4 (7.4%)**
	Neck pain	**3 (5.6%)**
	Halitosis	**5 (9.3%)**
	Torticollis	**5 (9.3%)**
	Fever	**4 (7.4%)**

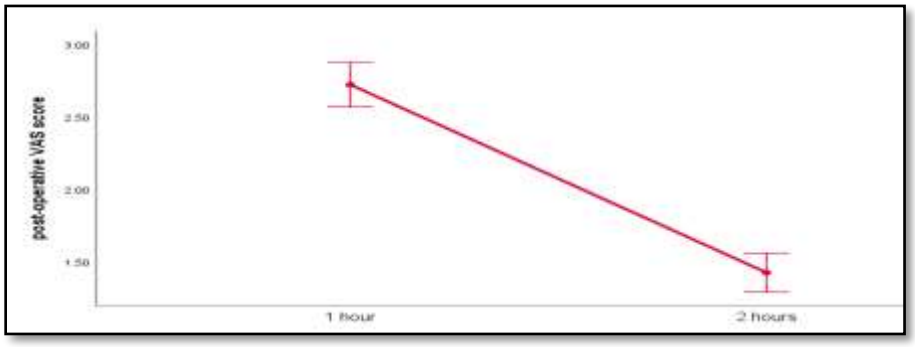

Fig. (2): Post-operative pain in all studied cases

Table (3): comparison between operation times in both groups

	Group 1	Group 2	X2	P value
Op. time (mean)	20.19	34.26	10.5	<0.0001
post-operative pain (mean)	2.01	0.78	6.43	<0.0001
Post-operative complications (n)	16	20	1.33	0.248

Discussion

The most frequent cause of nasal obstruction in children is adenoid enlargement. In 1842, Macleod Yearsley carried out the first adenoidectomy. Adenoidectomy is typically carried blindly out using a curette without observing the nasopharynx **(5)**.

Cannon et al. (6) were the first to describe the expression of endoscopic assisted adenoidectomy (EAA) with conventional instruments that was used for blind adenoidectomy (adenotome, adenoid punch, and forceps).

They recommended using the EAA technique as a supplement to a more thorough adenoidectomy because it is minimally invasive, prolongs the procedure by less than five minutes, and is not linked to excessive bleeding **(6)**.

The mean age was 7.15 years in all cases and 25 (46.3%) of them were males. Most of cases (68.5%) were grade 3 adenoiditis according to Clemens and McMurray scale.

In corporation with **Elsherif et al. (7)** study, the patients' age ranged from 2 to 12 years. The mean age was about 7 years. The youngest patient was 2 years old while the oldest was 12 years old. The same in **Di Rienzo Businco et al. (8)** study the mean age was 7.9 years (average of two groups) 9 were males and 11 were females in each group.

In the present study, the mean operation time in all endoscopic adenoidectomy was 27.22 min ±8.61. The intra operative complications was collateral injury in 3 cases (5.6%) and iintraoperative bleeding in 6 (11.1%) cases of microdebrider group where bipolar was used for hemostasis.

Post-operative complications was postoperative bleeding in 3 (5.6%) cases, local infection in 3 (5.6%) cases, AOM in 3 (5.6%) cases, postop voice change in 9 (16.7%) cases, Ear pain in 4 (7.4%) cases, neck pain in 3 (5.6%) cases, halitosis in 5 (9.3%) cases, torticollis in 5 (9.3%)cases and fever in 4 (7.4%) cases.

Operation time was significantly lower in group 1 (microdebrider) than group 2 (coblation) which was 20.19 min in average in group 1 and 34.26 min in group 2 ($p < 0.0001$)

Postoperative pain scores as assessed by VAS score 1 day significantly higher in Group 1 (microdebrider) as compared to Group 2 (coblation) postoperative ($P < 0.0001$)

There was no statistically significant difference between both groups regarding post-operative complications.

In study of **Singh et al. (9)** revealed that the intraoperative time taken to complete the procedure in group A (microdebrider) was 12.78 ± 3.8 min and in group B (coblation) was 22 ± 3.3 min with p value < 0.05. There was statistically significant difference in grade of Intraoperative Bleeding in both groups with mean grade of intraoperative bleeding being 1.4 ± 1.04 in group B and 3.5 ± 0.9 in Group A. The surgical field was poor to average in 33 cases ($n = 70$) in group A as compared to only 1 case ($n = 70$) in group B; the difference being statistically significant. The average post-operative pain score was 2.69 ± 0.99 and 1.17 ± 1.1 after post-operatively 24 h and 72 h respectively in group B; 7.14 ± 0.99 and 4.08 ± 1.42 respectively in group A.

The coblation adenoidectomy technique was associated with significantly reduced blood loss and operation time as reported in **Liu et al. (10)** study. However, the incidence of fever, neck pain, and halitosis were significantly lower in the microdebrider adenoidectomy group ($p < .01$). The difference in the postoperative primary and secondary hemorrhage between the two groups was not statistically significant ($p > .05$).

In **Mularczyk et al. (11)** study, the mean time (in minutes) for coblation (5.50) was significantly lower than ME (9.47) when controlling for the confounder: surgical site

exposure ($p < 0.001$). The surgical time was significantly influenced by the quality of exposure/visualization ($p = 0.037$). The coblator method had significantly less intraoperative blood loss compared to ME ($p < 0.001$). There was a statistically significant difference between coblation (1.53) and ME (2.05) for days of pain ($p = 0.045$) when controlling for the confounder adenoid size.

Conclusion

Both coblation and microdebrider adenoidectomy provide distinct advantages over traditional methods. One obvious benefit of coblation over microdebrider is the need for only one instrument, rather than necessitating a microdebrider and an electro-cautery device for hemostasis. However, the reduction of intraoperative time achieved by microdebrider is associated with less complications and cost.

Conflict of interest: The authors declare no conflict of interest.

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