The Egyptian Journal of Hospital Medicine (October 2021) Vol. 85 (1), Page 3209-3215

Comparison between Endoscopic Microdebrider Adenoidectomy and Conventional Curettage Method

Atef Taha El-Bahrawy, Khaled Abd-Elshakour Mohammed,
Ahmed Muftah Emhemmed Yadam*, Mohammed Elsayed Abdel Bary
Department of Otorhinolaryngology, Faculty of Medicine, Zagazig University, Egypt.
***Corresponding Author:** Ahmed Muftah Emhemmed Yadam, **Email:**ahmedyadim82@gmail.com

ABSTRACT

Background: Adenoidectomy is a surgical removal of hypertrophic nasopharyngeal lymphoid tissue forming a part of the Waldeyer's ring. Adenoid hypertrophy causes nasal obstruction and airway problems such as snoring, obstructive sleep apnea, recurrent sinusitis, and/or Eustachian tube dysfunction. These complications frequently lead to a need for adenoidectomy. **Objective:** To compare between cold curettage and endoscopic assisted powered technique as regard operative time, blood loss, postoperative complications.

Patients and Methods: This prospective study included 18 patients, both genders, all suffering from hypertrophied adenoid tissue, presented clinically with mouth breathing, snoring, bilateral nasal obstruction and/or discharge and evidenced radiologically with plain X-ray film lateral view to the nasopharynx. All cases presented to ENT Department Zagazag University, during the period from July 2019 to July 2021, seeking for management of their problem. Patients were divided into two groups (9 patients each); Group I: In which patients were undergone conventional adenoidectomy with adenoid curette. Group II: Patients were undergone endoscopic assisted powered adenoidectomy.

Results: Conventional curettage method of adenoidectomy group was associated with more operative bleeding than endoscopic assisted powered adenoidectomy group, but there was no significant difference. Nasal packing of conventional curettage method of adenoidectomy group was distributed as following; one patient (11.1%) required mild packing, 3 patients (33.3%) required moderate packing. While in endoscopic assisted powered adenoidectomy group, one (11.1%) required moderate packing.

Conclusions: Endoscope assisted powered adenoidectomy needs to be acknowledged as a safe alternative to conventional adenoidectomy.

Keywords: Conventional adenoidectomy, Curettage, Powered adenoidectomy.

INTRODUCTION

Nasopharyngeal tonsil becomes evident by six months to one year of life, increases rapidly in size during the first 6 to 8 years of life and generally atrophies by adolescence[(1)]. To determine the necessity for adenoidectomy the physician typically relies on physical examination and history. However physical examination provides little information about size of adenoid, although enlarged tonsils may be proved easily. Several radiological techniques have been proposed to favour the decision for adenoidectomy[(2)].

During the last 20 years, we have observed higher prevalence of sleep disordered breathing in children. Adenotonsillar enlargement leading to partial or complete obstruction of nasopharynx/oropharynx account for majority of these cases. Consequently adenoidectomy performed in children has increased significantly. Adenoidectomy can be performed as an isolated procedure or along with tonsillectomy. Adenoidectomy is conventionally performed using the curettage method with an adenoid curette. This is blind procedure and was described since 1885[(1)].

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 electro cautery, laser, or a combination of these instruments. 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[(3)].

One of the newest adenoidectomy techniques is endoscopic transnasal adenoidectomy utilizing a powered microdebrider. 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. This powered instrumentation, which was originally used to shave cartilage in arthroscopic surgery, has been popularized recently for use in nasal polypectomy and endoscopic sinus surgery[(4)].

This study aimed to compare between cold curettage and endoscopic assisted powered technique as regard operative time, blood loss, and postoperative complications.

PATIENTS AND METHODS

This is a prospective study, which included 18 patients, both genders, all suffering from hypertrophied adenoid tissue, presented clinically with mouth breathing, snoring, bilateral nasal obstruction and/or discharge and evidenced radiologically with

Received:30/5 /2021
Accepted:26/7 /2021

plain X-ray film; lateral view to the nasopharynx. All cases presented to ENT department Zagazig University, during the period from July 2019 up to July 2021, seeking for management of their problem**.**

Ethical considerations:

Written informed consent was obtained from all caregivers of the participants. The study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (declaration of Helsinki) for studies involving humans.

We considered the following inclusion criteria: Patients' age ranged between 6 years to 18 years. Adenoid was the only cause for nasal obstruction. History of mouth breathing, snoring, bilateral nasal obstruction and/or bilateral nasal discharge. X-ray evidence of adenoid hypertrophy encroaching on the airway column.

Our exclusion criteria were:

Bleeding or coagulation defects. Craniofacial abnormalities. Acute upper respiratory tract infections. Velopharyngeal insufficiency.

Steps of performance before surgery:

A detailed history was obtained, and aural examination was done. Patients were selected on the basis of: Nasal obstruction, Nasal discharge, Snoring, Hyponasality, Deafness, Cough, Halitosis, GIT symptoms, Growth retardation, Learning complaints, Sneezing "to rule out allergy", Fluid regurgitation through the nose "to rule out velopharyngeal insufficiency", Aural examination .

Diagnostic nasal endoscopy was performed at time of the initial evaluation using the rigid and/or flexible endoscope. Flexible endoscope was needed in young children and in markedly hypertrophied turbinates to avoid trauma. The evaluation was performed under local anesthesia after spraying the nose with 4% lidocaine and 0.05% oxymetazoline. The vasoconstrictor was not always necessary. The child was asked to inhale through the mouth and swallow occasionally.

Operative technique:

Group I: patients were undergone conventional adenoidectomy with adenoid curette**,** under general anesthesia with oral endotracheal intubation, a Davis-Bowel mouth gag was used to open the mouth. The nasopharynx was palpated digitally to examine for adenoid hypertrophy. Using the conventional curette, the hypertrophied adenoid tissue was removed. Hemostasis was secured by packing the operative bed with a gauze soaked with 0.05% oxymetazoline. After pack removal, hemostasis was achieved by dealing with any bleeding point by the bipolar coagulator by retraction of the soft palate.

Group II: Patients were given general anesthesia with orotracheal intubation. The theatre set up and positioning was as for a standard functional endoscopic sinus surgery. The nasal cavities were decongested by using pledgets soaked in 4% lignocaine with 1:10,000 adrenaline. Using a 0° 2.7 mm rigid telescope (4 mm for older children), the posterior choanae and nasopharynx were assessed. Microdebrider with irrigating blades of different angles 0, 15, 45 and 60° or special adenoid blade was used.

The special adenoid blade is longer, and has a window on convex side. Sinuscope and debrider were passed through the same nostril or, the sinuscope through one nostril and debrider through the other. In some cases sinuscope was passed through nose and debrider through the oral cavity with angled blade. Under endoscopic vision the shaver cannula was passed into nose with suction switched off to avoid trauma to turbinates or the septum.

The suction was then turned on, which drew the adenoid tissue in and the rotating blade shaves it under constant endoscopic vision. The adenoidectomy was started high in the nasopharynx from upper limit of adenoid tissue, which often cannot be reached by conventional curette. Resection was continued in side to side fashion on an even level until the inferior edge of adenoid pad was reached. The cutting and aspirating action of the shaver and simultaneous irrigation removes both adenoid tissue and the blood, thus providing a clear view. Better control of the depth of removal of adenoid was achieved thus avoiding damage to underlying structures. Hemostasis was obtained by applying pledgets soaked in hydrogen peroxide or by suction diathermy in few cases. A nasopharyngeal pack was kept for few minutes and then removed. Mouth gag was removed.

Postoperative medication:

All patients were given the same medical treatment in the form of antibiotics, analgesics and local nasal decongestant.

Postoperative follow up:

Patients were followed up weekly for l month, then monthly for 3 months. Questionnaire was used for assessment of the subjective improvement in symptoms. Recurrence of hypertrophied adenoid was evaluated by clinical manifestations nasal obstruction, nasal discharge, snoring, nasal tone of voice and mouth breathing, endoscopic evaluation and radiological assessment plain X-ray nasopharynx with soft tissue radiation dose with mouth opened and neck extended was done for all patients to detect adenoid recurrence.

Statistic analysis

All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc.,

Chicago, IL, USA 2011). Quantitative data were expressed as the mean ± SD and range, and qualitative data were expressed as frequency and percentage. T-test was used to compare between two groups of normally distributed variables. Mann Whitney U test was used to compare between two groups of non-normally distributed variables. Percent of categorical variables were compared using Chi-square test or Fisher Exact test when appropriate. All tests were two sided. P-value < 0.05 was considered statistically significant.

RESULTS

Table 1 shows that there was no significant difference between both groups as regard age and sex.

Table (1): Comparison between basic characters of studied groups

Demographic characters	Studied groups		P
	Conventional curettage method adenoidectomy group n. 9	Endoscopic assisted powered adenoidectomy group n. 9	
Age per years Mean ± SD (range)	9.78±2.23 7-14	11.78± 2.53 9-16	0.094
Gender Females Males	2 (22.2) 7 (77.8)	5 (55.6) 4 (44.4)	0.33

All patients of both groups represented with nasal obstruction and mouth breathing, CT finding confirmed adenoid enlargement (Table 2).

Table (2): Patients symptoms of studied groups

			Studied Groups	
			Conventional curettage method of adenoidectomy group n. 9	Endoscopic assisted powered adenoidectomy group n. 9
Represent symptoms	Nasal obstruction	N	9	9
		%	100.0%	100.0%
	Mouth breathing	N	9	9
		%	100.0%	100.0%
Diagnosis CT	Positive	N	9	9
		%	100.0%	100.0%

Table 3 shows that mean duration per minute of operation was significantly shorter among conventional curettage method of adenoidectomy group than endoscopic assisted powered adenoidectomy group.

Table (3): Operation duration per minute of studied groups

	Studied groups		P
	Conventional curettage method of adenoidectomy group n.9	Endoscopic assisted powered adenoidectomy group n.9	
Operation time per minute Mean ± SD	16.44±2.01	31.67± 2.12	0..0001**

There was no significant difference between both groups as regard operative data (Table 4).

Table (4): Operative data of studied groups

				Studied Groups		P
				Conventional curettage method of adenoidectomy group n.9	Endoscopic assisted powered adenoidectomy group n.9	
Operative bleeding		Yes	N	4	1	0.29
			%	44.4%	11.1%	
		No	N	5	8	
			%	55.6%	88.9%	
Temporary post nasal packing		Yes	N	4	1	0.29
			%	44.4%	11.1%	
		No	N	5	8	
			%	55.6%	88.9%	
Amount of bleeding	Mild 2 packing 20 cc	Yes	N	1	0	1
			%	11.1%	0.0%	
	Moderate 4 pack 40 cc	Yes	N	3	1	0.576
			%	33.3%	11.1%	
	Severe more than 4 packing	Yes	N	0	0	-
			%	0.0	0.0	
	Duration of nasal packing/minute	Mean ± SD		7±2.16	5±???	0.28

As regard postoperative residual adenoid tissue the difference was statistically insignificant between both groups (Figure 1).

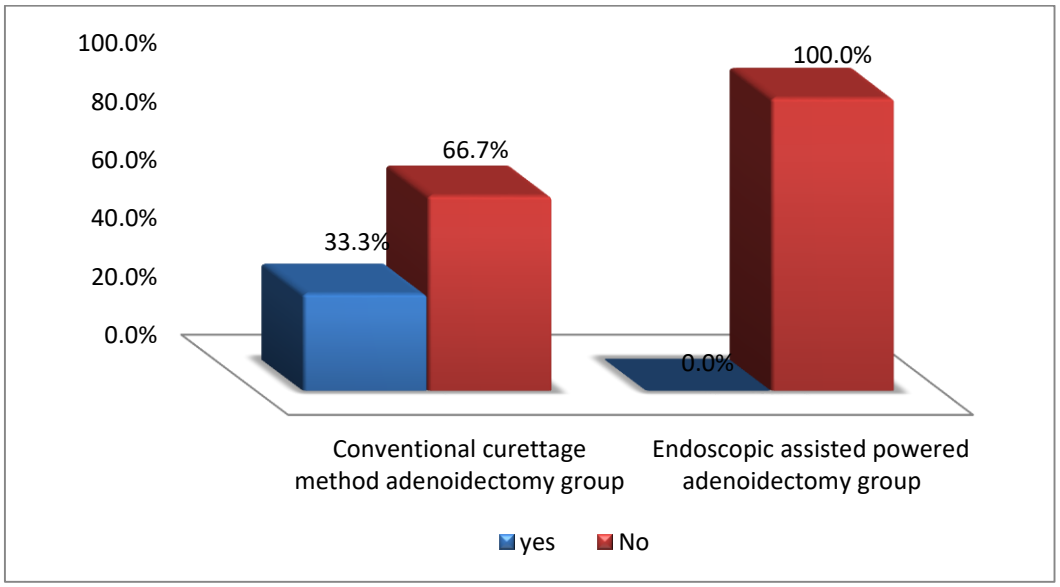

Figure (1): Postoperative residual adenoid tissue of studied groups.

Regarding adenoid recurrence the difference was statistically insignificant between the 2 studied groups (Figure 2).

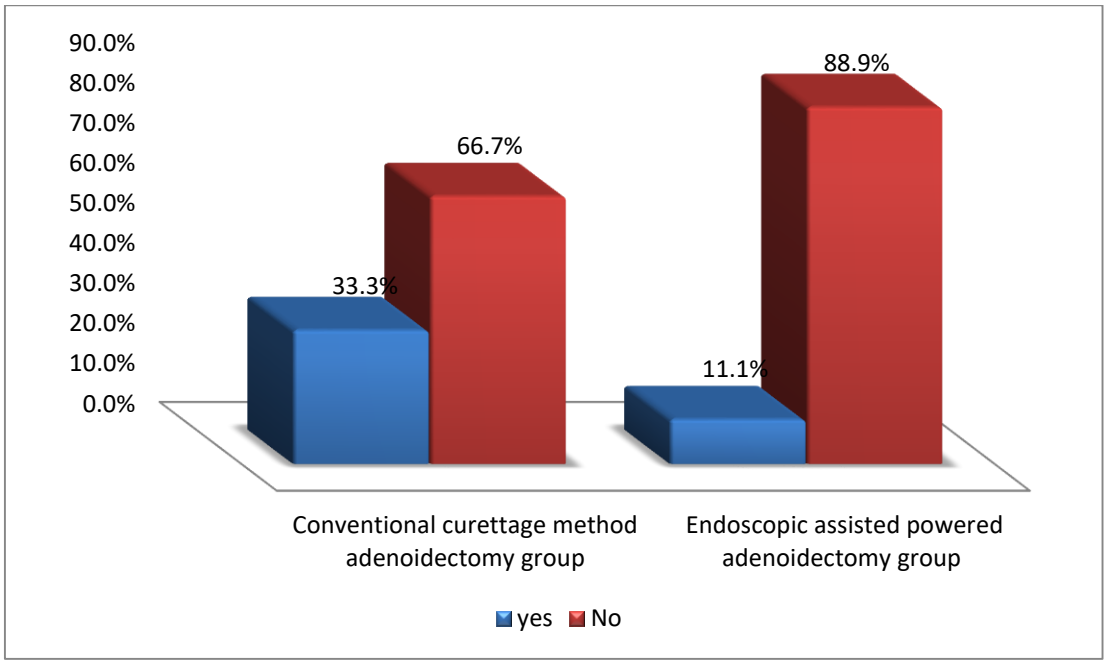

Figure (2): Adenoid Recurrence at follow up period of studied groups.

DISCUSSION

In the current study, there was no significant difference between both groups regarding age and gender with slightly male predominance. This came in agreement with **Wadia and Dabholkar[5], Atilla *et al.*[6], Singh *et al.* [7], Juneja *et al.*[8]** who found that there was no statistical difference between the groups regarding age or sex (baseline characteristics). Adenoid hypertrophy is common in children. Size of the adenoid increases up to the age of 6 years, then slowly atrophies and completely disappears at the age of 16 years. Adenoid hypertrophy in adults is rare**[9].** On the other hand, adenoid hypertrophy, the most common indication for adenoidectomy, shows a slight male predominance**[10].**

In the present study, all patients of both groups represented with nasal obstruction and mouth breathing and CT findings confirmed adenoid enlargement. This came in agreement with **Juneja *et al.*[8], Prakash *et al.*[11], Somani *et al.*[12], Datta *et al.* [13]** who found that radiographic evaluation revealed enlarged adenoids in 100 % of patients with an adenoidal–nasopharyngeal ratio of equal to or more than 0.7. These findings were corroborated by endoscopic evaluation, which revealed grade III adenoid hypertrophy in 76 % of patients and grade IV in 16%, according to the grading of **Clemens *et al.*[14].** The procedures conducted were adenoidectomy, with or without tonsillectomy, with or without myringotomy and grommet insertion.

In the current study, mean duration per minute of operation was significantly shorter among conventional curettage method of adenoidectomy group 16.44±2.01 with range from 14 minute to 20 minute, versus 31.67± 2.12 with range from 29 minute to 36 minute of endoscopic assisted powered adenoidectomy group. This came in agreement with **Juneja *et al.* [8]** who found that the mean operative time was 19.80 minutes (range, 7–28 minutes) in conventional curettage group and 34.08 minutes (range, 15–60 minutes) in endoscopic assisted powered adenoidectomy group. The difference between the two groups was statistically significant ($p < 0.05$). These operative time results were in accordance with those of **Datta *et al.* [13]** and **Hussein and Jaboori [15].** In study by **Bradoo *et al.* [16]** (n = 32), it was observed that mean operative time in conventional group was 9 min while in endoscopic group, it was 14 min ($p< 0.05$).

However, the powered instruments were found to be 58 % faster in a study by **Koltai *et al.*[17]**. Our findings were also dissimilar to those of **Stanislaw *et al.*[18]** who reported powered adenoidectomy to be 20 % faster than curette adenoidectomy, and to the results of **Feng and Yin.[19] Murray *et al.* [20]** also had dissimilar results, wherein endoscopic assisted powered adenoidectomy was found to be 59% faster**[2].**

Patients undergoing transnasal endoscopic visualization of adenoids require nasal decongestion with adrenaline soaked cotton pledgets, which adds to the total surgical time. Endoscopic assisted powered adenoidectomy also requires the setting up of additional instruments, more technical skills and involves the complete removal of adenoids under vision, which takes more time than conventional adenoidectomy. Moreover, removal of the adenoids from all nasopharyngeal areas creates a wider raw area, which bleeds more, and this requires more time to control the bleeding. The microdebrider blade, being a powered instrument, can damage underlying muscle while attempting a complete adenoidectomy. This leads to excessive oozing from the injured muscle that is difficult to control, as seen in three endoscopic assisted powered adenoidectomy patients in the present series. All these factors played a role in increasing the surgical time in endoscopic assisted

powered adenoidectomy. However, with each passing case, there was an increase in expertise, improved skills and greater precision. Hence, the surgical time and blood loss decreased[8].

In the present study, conventional curettage method of adenoidectomy group was associated with more operative bleeding, 4 patients (44.4%), versus 1 patient (11.1%) in endoscopic assisted powered adenoidectomy group, but there was no significant difference. Nasal packing of conventional curettage method of adenoidectomy group, was distributed as following; one patient (11.1%) required mild packing, 3 patients (33.3%) required moderate packing while in endoscopic assisted powered adenoidectomy group one patient (11.1%) required moderate packing. This came in agreement with **Wadia and Dabholkar** [5] who found that blood volume loss was seen more with endoscopic procedure, however the difference was statistically non-significant. This came in also agreement with **Juneja *et al.*** [8] who found that there was no significant difference between both groups regarding bleeding loss. Most of the patients achieved hemostasis with saline-soaked nasopharyngeal gauze packs. Three patients in endoscopic assisted powered adenoidectomy group required additional procedures such as suction diathermy and nasal packing using Merocel. In conventional curettage group, none of the patients required any additional procedure for hemostasis. Our observation was in contrast to studies performed by **Koltai *et al.*** [21], **Rodriguez *et al.*** [22] **and Heras and Koltai** [23] who reported less total operative time and blood loss with the endoscopic-assisted powered technique. **Singh *et al.*** [7] found that there was significant difference between both groups regarding blood loss.

In the present study, conventional curettage method of adenoidectomy group was associated with postoperative residual adenoid tissue in 3 patients (33.3%), while none in endoscopic assisted powered adenoidectomy group but the difference was statistically insignificant. This came in agreement with **Juneja *et al.*** [8] who found that none of the patients in endoscopic assisted powered adenoidectomy group had residual adenoid tissue, indicating complete removal in all patients. In conventional curettage group, 22 patients showed residual tissue on radiography (an adenoidal–nasopharyngeal ratio of less than or equal to 0.4) and on nasal endoscopy (80 % had grade I and 8 % had grade II residual adenoid tissue), with less than 20 % residual tissue in only 3 patients. The p-value calculated was less than 0.005, which was significant.

In the current study, during follow up period, adenoid recurrence was detected among conventional curettage method of adenoidectomy for one patient (11.1%) after six months, 2 patients (22.2%), after one year follow up, versus 1 patient (11.1%) after one year follow up, in endoscopic assisted powered adenoidectomy group, and the difference was statistically insignificant. **Singh *et al.*** [7] found that at the 3-month follow-up, no residual disease was found in endoscopic assisted powered adenoidectomy group. However, in conventional curettage group, 23 patients (77%) presented with residual disease-causing nasopharyngeal symptoms and sleep-disordered breathing. It was hence observed that chances of residual disease were significantly higher with the conventional technique compared to the endoscopic procedure.

Thus, endoscopic powered assisted adenoidectomy offers several benefits like more complete resection, less collateral damage and lesser recurrence. However, these benefits have to be weighed against higher cost and longer operative time involved. Also, completeness of resection has to be weighed against hyper-nasalance and possible velopharyngeal insufficiency which goes with a more complete removal.

CONCLUSION

Endoscope assisted powered adenoidectomy needs to be acknowledged as a safe alternative to conventional adenoidectomy. Adenoid removal with the endoscopic method is more complete, accurate and there is lower incidence of recurrence in comparison with conventional adenoidectomy. However, it was not found to be a faster procedure in contrary to some reports in literature. Conventional curettage still remains faster and cheaper and may be continued in high volume charitable centers especially being useful for the otolaryngology trainee.

Financial support and sponsorship: Nil.
Conflict of interest: Nil.

REFERENCES

1. **Ravishakar C, Killera S (2018):** Comparing endoscopic microdebrider assisted adenoidectomy with curettage procedure. Int J Otorhinolaryngol Head Neck Surg., 4:559-64.
2. **Pandian S, Shobha T (2014):** Power assisted transoral endoscopic vs conventional adenoidectomy – a comparison. Int J Pharm Bio Sci., 5: 579–82.
3. **Elsherif A, Abdul Raaof A, Issa S (2020):** Comparative study of adenoidectomy by endoscopic transoral suction coagulation versus the traditional method. The Egyptian Journal of Hospital Medicine, 81(7): 2405-2409.
4. **Elmagd E, Khalifa M, Abeskharoon B *et al.* (2021):** Comparative study between conventional adenoidectomy and adenoidectomy using micro-debrider. The Egyptian Journal of Otolaryngology, 37(1): 1-5.
5. **Wadia J, Dabholkar Y (2020):** Comparison of conventional curettage adenoidectomy versus endoscopic powered adenoidectomy: A randomised single-blind study. Indian Journal of Otolaryngology and Head and Neck Surgery, 20: 1-6.
6. **Atilla M, Kaytez S, Kesici G *et al.* (2020):** Comparison between curettage adenoidectomy and endoscopic-assisted microdebrider adenoidectomy in terms of Eustachian tube dysfunction. Brazilian Journal of Otorhinolaryngology, 86: 38-43.
7. **Singh S, Padiyar B, Sharma N (2019):** Endoscopic-assisted powered adenoidectomy versus conventional adenoidectomy: A Randomized Study. Dubai Medical Journal, 2(2): 41-45.
8. **Juneja R, Meher R, Raj A *et al.* (2019):** Endoscopic assisted powered adenoidectomy versus conventional adenoidectomy–a randomised controlled trial. The Journal of Laryngology and Otology, 133(4), 289-293.

9. **Rout M, Mohanty D, Vijaylaxmi Y *et al.* (2013):** Adenoid hypertrophy in adults: A case series. Indian Journal of Otolaryngology and Head and Neck Surgery, 65(3): 269–274.
10. **Chinawa J, Akpeh J, Chinawa A (2015):** Clinical profile and pattern of adenoid hypertrophy among children attending a private hospital in Enugu, South East Nigeria. Pan African Medical Journal, 21: 191-193.
11. **Prakash N, Mallikarjunappa A, Samuel H (2013):** Endoscopic assisted adenoidectomy versus conventional curettage adenoidectomy – a comparative study. Natl J Otolaryngol Head Neck Surg., 10:10–12.
12. **Somani S, Naik C, Bangad S (2010):** Endoscopic adenoidectomy with microdebrider. Indian J Otolaryngol Head Neck Surg., 62:427-31.
13. **Datta R, Singh V, Deshpal (2009):** Conventional versus endoscopic powered adenoidectomy: a comparative study. Med J Armed Forces India, 65:308–12.
14. **Clemens J, McMurray J, Willging J (1998):** Electo cautery versus curette adenoidectomy: comparison of postoperative results. Int J Pediatr Otorhinolaryngol., 43:115–122.
15. **Hussein I, Jaboori S (2012):** Conventional versus endoscopic-assisted adenoidectomy: A comparative study. Med J Babylon, 9(3):570- 82.
16. **Bradoo R, Modi R, Joshi A *et al.* (2011):** Comparison of endoscopic assisted adenoidectomy with conventional adenoidectomy. Comparison of endoscopic assisted adenoidectomy with conventional adenoidectomy. Clinical Rhinol., 4(2):75-8.
17. **Koltai P, Kalathia A, Stanislaw P *et al.* (1997):** Power-assisted adenoidectomy. Arch Otolaryngol Head Neck Surg., 23:685–8.
18. **Stanislaw P, Koltai P, Feustel P (2000):** Comparison of power-assisted adenoidectomy vs adenoid curette adenoidectomy. Arch Otolaryngol Head Neck Surg., 126:845–9.
19. **Feng Y, Yin S (2006):** Comparison of powered-assisted adenoidectomy with adenoid curette adenoidectomy [in Chinese]. Lin Chuang Er Bi Yan Hou Ke Za Zhi., 20:54–7.
20. **Murray N, Fitzpatrick P, Guarisco J (2002):** Powered partial adenoidectomy. Arch Otolaryngol Head Neck Surg., 128:792–6.
21. **Koltai P, Chan J, Younes A (2002):** Power-assisted adenoidectomy: Total and partial resection. Laryngoscope ,112:29–31.
22. **Rodriguez K, Murray N, Guarisco J (2002):** Power-assisted partial adenoidectomy. Laryngoscope, 112:26–28.
23. **Heras H, Koltai P (1998):** Safety of powered instrumentation for adenoidectomy. Int J Pediatr Otorhinolaryngol., 44(2):149–153.