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Conventional Versus Endoscopic-Assisted Adenoidectomy : A Comparative Study

Dr. Ihsan Allawi Hussein[1], Dr. Khaild Mohsin Khashan[2] and Dr. Hussein Ali Hussein[3]

[1,3]F.I.C.M.S.(ENT) AL-Hussein general teaching hospital.

[2]C.A.M.B.S.(ENT) AL-Hussein general teaching hospital.

Abstract: Background Adenoidectomy is the surgical procedure to remove the adenoids.It is conventionally performed using the curettage method. The aim is to compare between conventional and endoscopic -assisted method regarding safety and efficiency Patients and methods: This is a prospective randomized clinical trial study that is conducted at otolaryngology department from Imam-al-Hussein Medical Teaching City/Holy Karbala Directorate from September 2023 to October 2024, 40 patients (16 males and 24 females), requiring adenoidectomy were randomized into two groups each of twenty. Group A underwent conventional adenoidectomy using the curettage method and Group B underwent trans-nasal endoscopic adenoidectomy using microdebrider . The parameters studied were intra-operative time,complete resection ,associate trauma,velopharyngeal dysfunction, residual remnant , post-operative bleeding, infection, and post-operative symptomatic relief. Exclusion criteria include: post-operative pain and the amount of blood loss because the majority of patients underwent additional tonsillectomy Telephone questionnaire used to follow up any symptomatic recurrence. Results:After a short period of follow up,the time taken in Group A (conventional surgery) varied from 10-35 minutes [with a mean= 32.25 minutes](95% CI 20.004-26.496) (P <0.001) and in Group B (endoscopic method) from 20-90 minutes [with a mean of 42.75 minutes] (95% CI 43.097-15.604) The resection was almost complete in group B whereas in group A four cases (20%) had residual adenoid tissue (95% CI _0.3895-_ 0.0141)(P<0.035).associated trauma in Group A found in 3 cases (15%) all are minor involving the uvula and posterior pharyngeal wall whereas in Group B trauma occurs in 5 cases (25%),3 are minor involving septal mucosal injuries while 2 cases (10%) required nasal packing (P>0.05). Velopharngeal dysfunction developed in 2 cases (10%) of Group A and 3 cases(15%) of Group B,all are resolved spontaneously within a week and not treatment (95% CI 0.0155-0.255) (P>0.05).Infection complicated 1 cases (5%) of Group A and 1 case of Group B(95% CI_0.1479-0.3479) (P>0.05).Retained swab complicated 1 case (5%) of Group A whereas none in Group B .The overall complication rate in Group A was 55% whereas in Group B 45%. Conclusion : Endoscopic -assisted Adenoidectomy is a safe and effective alternative to curettage method as it allows complete removal of adenoid tissue under direct vision It is recommended to perform endoscopic -assisted surgery even with curettage method when possible.

Keywords: Adenoidectomy, Lushka's tonsil, Surgical Procedure.

INTRODUCTION

Santorini described the nasopharyngeal lymphoid aggregate or Lushka's tonsil in 1724. Wilhelm Meyer coined the term "adenoid" to apply to what he described as nasopharyngeal vegetation in 1870. The adenoid forms part of Waldeyer's ring of lymphoid tissue at the portal of the upper respiratory tract. In early childhood, this is the first site of immunological contact for inhaled antigens. The adenoid has been associated with upper airway obstruction, as a focus of sepsis, and more recently with the persistence of otitis media with effusion [Peter, J. R 2008].

PATIENTS AND METHODS

The present study was carried out in Imam-al-Hussein Medical Teaching City/Holy Karbala Directorate. To achieve the objectives of study a prospective randomized trial was designed. Forty patients between the age of 4-20 years and requiring adenoidectomy for variable indications were included in the study.The patients underwent a preoperative assessment including clinical examination using cotton test for nasal patency,ear examination ,radiography of post-nasal space, and fiber-optic nasendoscopy.

The size of adenoid was assessed using Clemens Mcmurray scale[Peter, J. R 2008; Clemens, J. *et al*., 1998] where:

Grad 1: adenoid tissue filling one third of the vertical height of th

Grad II: up to two third

Grad III: from two third to nearly complete obstruction of the Choana

Grad IV: complete Choanal obstruction

All the cases were randomized into two consecutive groups each of twenty.

Group A underwent conventional adenoidectomy and Group B underwent endoscopic assisted adenoidectomy General anesthesia was used using oro-tracheal tube. In the conventional technique, adenoidectomy was done using the curette,In the endoscopic technique, endoscope of 4mm diameter is used trans-nasally along with a microdebrider at a speed of 4000 rpm. Both endoscope and microdebrider were introduced through one side of

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*Corresponding Author: Dr. Ihsan Allawi Hussein

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nasal cavity.When this is not possible because of anatomical limitation, the endoscope is introduced through one side and microdebrider through the other. Visualization is improved by frequent irrigation and suctioning.No posterior packing is required and no cautery is used during surgery. The intra-operative parameter studied were operative time, primary bleeding ,associate traumas and completeness of removal of adenoid.Post-operative parameter include assessment of post-nasal space for any remnant or evidence of infection using fiber-optic nasendoscope one week post-operatively and relief of symptoms of obstruction and sleep pattern. Telephone questionnaire is used to maintain contact with the patients.

RESULTS

The mean age of patients was 6.75 years in Group A and 11.8 years in Group B

The types of surgical procedures done to the patients were classified into three groups :

Adenoidectomy , adenotonsillectomy ,adenoidectomy with bilateral myringotomy as shown in figure 1.

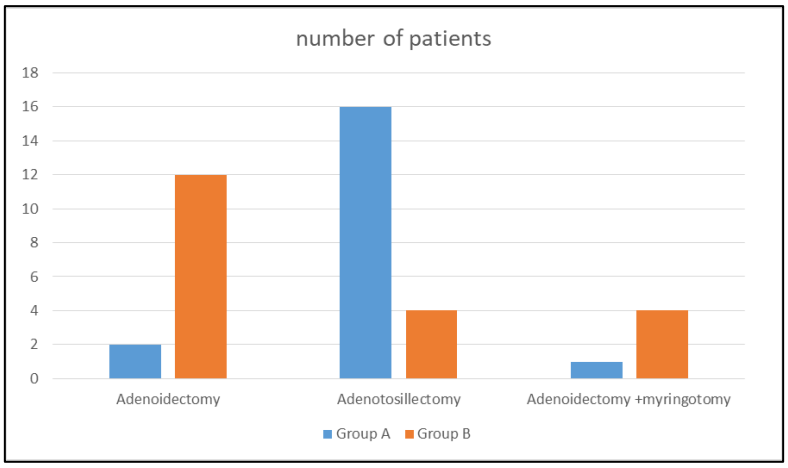


Figure 1.surgery performed in the three group

The time taken in group varied from 10-35 minutes with mean of 23.25 minute ,while in Group B the time taken varied from 20-90 minutes with mean of 42.75 minutes as in figure.2

The predominant indication for adenoidectomy was sleep disordered breathing.

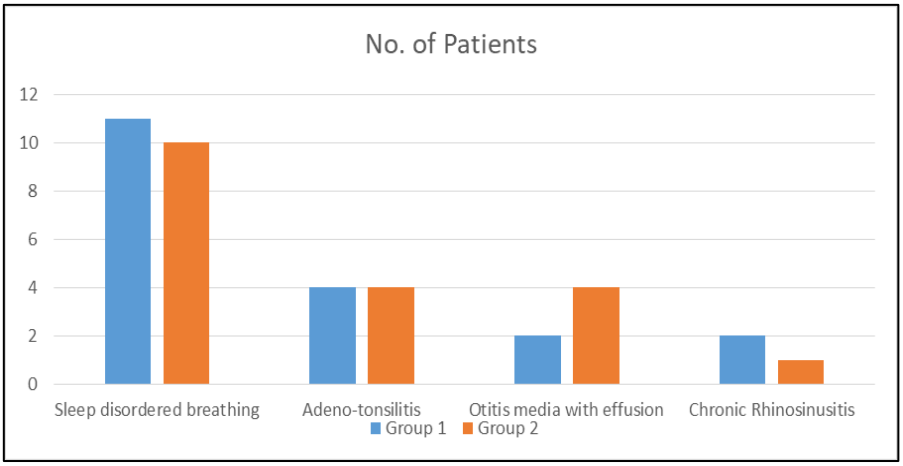


Figure 2. Indication of surgery in the two groups

The distribution of symptoms in the two groups as they follow:

Table 1: percentage of symptoms

Percentage	Numbers	Symptoms
20%	8	Nasal obstruction
57.5%	23	Sleep disturbance
15%	6	Ontological symptoms

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7.5%	3	Discharge
0%	0	Epistaxis

The post-operative fiber-optic nasendoscopy to look for residual adenoid tissue showed that resection was almost complete in Group B, whereas four cases (20%) of Group A had residual adenoid tissue. The fiber optic nasendoscopy was also used to look for associated trauma. In Group A, three cases (15%) had trauma, all minor involving the uvula and posterior pharyngeal wall, whereas in Group B, trauma occurred in five cases (25%). Three were minor septal mucosal injuries, while two cases (10%) were major and required anterior nasal packing.

Velopharyngeal dysfunction causing hypernasal speech without nasal regurgitation developed in two cases (10%) of Group A and three cases (15%) of Group B, all of which were temporary resolved spontaneously within a week

Infection occurred in 1 case (5%) of each group. Retained swab complicated 1 case (5%) of Group A but none in Group B. Symptoms resolved in all patients of Group B, whereas two patients in Group A (10%) continue to have symptoms.

Table 2: omparison of Endoscopic-Assisted and Conventional Adenoidectomy Outcomes

parameter	Conventional adenoidectomy	Endoscopic-assissted adenoidectomy	Remarks
Operating time	23.25 minutes	42.75 minutes	P<0.0001
Remnant	20%	None	P<0.0035
Associtated trauma	15%	25%	Not significant
Velopharyngeal dysfunction	10%	15%	P<0.05
Infection	5%	5%	P<0.05
Retained web	5%	None	Not significant

DISCUSSION

The present study attempted to compare the conventional curette method with the endoscopic-powered technique. The groups were matched in age, type of surgery, and indications

The indications for surgery were variable, but the prominent indication was sleep-disordered breathing in both groups, accounting for 23 cases (57.5%).

Adenoidectomy also forms an important treatment option for otitis media with effusion, recurrent adeno-tonsillitis, and pediatric chronic rhinosinusitis. It is conventionally performed using the curettage method, which is a blind procedure with possible damage to the Eustachian tube orifices and does not provide complete removal of all adenoid tissue, which in the long term may lead to recurrence. [Datta, R., & Singh, V. P. 2009; Stanislaw, P. *et al*., 2000; Feng, Y., & Yin, S. 2006; Koltai, P. J. *et al*., 2002]

The advent of the endoscope improved access to the nasopharynx, and it is now possible to perform the procedure under direct vision

Though the precise steps of adenoidectomy would only take 5–10 minutes, the true assessment of operating time should include preparations and setting of the instrument, packing, and securing the hemostasis. The increase in operating time in the endoscopic method is probably related to increased setting time, endoscopic visualization, and bite-by-bite removal of adenoid tissue. The increase in time adds about 20 minutes to surgery and is greatly influenced by the surgeon's experience. This study notes a gradual improvement in operating time from the first to the last patient as experience improved.

Our findings are in contrast to those by Stanislaw *et al*. [Stanislaw, P. *et al*., 2000] and Feng Y. *et al*. [Feng, Y., & Yin, S. 2006] who have reported powered adenoidectomy to be 20% faster than curette adenoidectomy.

In their study, they used a 45-degree angled shaver blade through the oropharynx and not the nose under a laryngeal mirror for visualization. The microdebrider is a dangerous instrument that should be used under direct vision as provided by an endoscope

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In contrast, our findings are consistent with those reported by Rakeh Datta, who used endoscopic-powered adenoidectomy through the nose and concluded that this technique is safe, effective, with less blood loss and less collateral damage, but it takes more time. This study found that Endoscopic adenoidectomy consumes more time, which can be reduced with experience It has been noted that the extent of resection following a conventional method was incomplete, which may lead to recurrence of the condition. This study included one patient who had operated on three years ago using a curette adenoidectomy and now presented with recurrence of symptoms with Grade III adenoids.

This patient underwent another surgery using an endoscopic method with a good result. Also, four patients underwent a conventional adenoidectomy had remnants, and two of them were symptomatic during follow-up.

The criterion for adenoid tissue sufficient to cause nasal obstruction was tissue occupying more than 40% of the nasopharynx.[Peter, J. R. 2008; Buchinsky, F. J. *et al*., 2000]

In endoscopic adenoidectomy, the nasopharynx can be seen properly, and any remnant of adenoid tissue can be removed under direct vision. This makes the endoscopic technique more accurate. This finding is consistent with those reported by Rakesh Datta, Stanislaw P, and Koltai PJ.[Datta, R., & Singh, V. P. 2009; Stanislaw, P. *et al*., 2000; Koltai, P. J. *et al*., 2002]

Associated trauma is a frequent finding following adenoidectomy. In Group A, there is a possibility of trauma to the Eustachian tube orifice leading to scarring and dysfunction, whereas in Group B, there is an increased incidence of septal mucosal injuries, which is reported in 5 cases. Only 2 required anterior nasal packing.

So, both techniques have their own problems; these are usually minor and resolve within a few days.

The postoperative pain was not assessed because the majority of patients underwent additional tonsillectomy, and it is difficult to appreciate, in children, whether the pain is due to adenoid or tonsil surgery. Also, the amount of blood loss was not assessed for the same reason and some technical difficulties

Although the newer endoscopic-assisted adenoidectomy is safe and effective, particularly in providing completeness of removal and a lower complication rate, it has several drawbacks, such as:

1. Increased operating time
2. Increased incidence of nasal mucosal injuries
3. Poor access for endoscope in some children due to anatomical constraints.
4. Endoscopic technique requires experience and availability of the equipment

On the other hand, endoscopic method has an important role in selected patients such as those with cleft palate and other craniofacial anomalies, for whom adenoidectomy was avoided because of the risk of velopharyngeal dysfunction. An accurate removal using endoscope and microdebrider enables the surgeon to carefully excise the untouched part of the adenoid and the velopharyngeal sphincter

In this study, adenoids were identified in 5 adult patients, all of whom underwent endoscopic removal, since access is better than that in children. Adenoids can persist into adulthood, and it is suggested that adenoid tissue in adults has some histological differences from that in children, being reactive rather than inflammatory, and adenoidectomy under transnasal control is safe and reliable. [Kamel, R. H., & Ishak, E. A. 1990] This group of patients is a good candidate for endoscopic adenoidectomy.

The result of the majority of published series comparing endoscopic-assisted adenoidectomy versus curette adenoidectomy is shown in Table 3.

Table 3: Results of major published series

The author	Date	Findings
Stanislaw P, Koltia PJ	2000	Powered adenoidectomy provid faster,dryer,more complete resection with less blood loss
Rakesh	2009	Powered adenoidectomy is safe effective,with less blood loss,less trauma but more operating time

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Reda H.Kamel	2007	Adenoidectomy under transnasal control is safe and reliable
Feng Y,Yin S	2006	Powered assisted adenoidectomy is faster with less blood loss
Elluru Ravindhra	2002	Power-assisted adenoidectomy offer shorter operative time and less blood loss but expensive and need experience

LIMITATION

1.Short follow-up period, as any new technique needs a longer period to assess its long-term efficacy.

2.Small number of patients included in this study, as it takes longer operating time, and many surgeons still favor conventional methods for shorter operative times.

3.Any endoscopic surgery requires strict cooperation with an anesthetist who should have experience with pediatric anesthesia to provide a bloodless field.

4.This technique requires experience and different sizes of equipment to deal with the small and narrowed nasal cavities found in children.

CONCLUSIONS

1.Endoscopic assisted powered adenoidectomy is a safe and effective alternative to curette adenoidectomy.

2.It is more complete and accurate.

3.It has several drawbacks which preclude their routine use

4.It need special equipment and experience and more operating time.4.

5.The endoscopic method is useful method for choanal adenoid extending into the nasal cavity, recurrent cases, or for cases of submucosal cleft palate and craniofacial anomalies requiring partial resection.

RECOMMENDATION

1.Although traditional assessment of adenoid size is done digitally prior to curettaging the adenoid, preoperative fiber-optic nasendoscopy is a good practice as it is more accurate than radiological evaluation and is possible in most young children.

2.Endoscopic adenoidectomy is an effective alternative when dealing with choanal adenoid extending into the nasal cavity or in recurrent cases requiring more accurate resection of adenoid tissue.

3.Younger children or adults are good candidates as this group provides a wider access for introduction of the endoscope.

4.The longer operating time is a cheap price to pay for achieving complete removal of adenoid tissue under direct vision rather than doing a blind procedure, which has no place in modern otolaryngology.

5.Even if procedures are done using the curettage method, it is recommended to do it under endoscopic guidance whenever possible.

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