# Conventional Versus Endoscopic-Assisted Adenoidectomy: A Comparative Study

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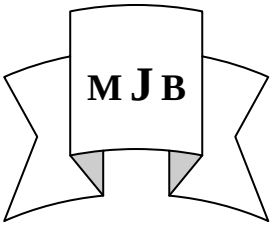


## Abstract

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** : from September 2010 to October 2011 , 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 ,associated 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 was 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 required any 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 allow complete removal of adenoid tissue under direct vision .It is recommended to perform endoscopic –assisted surgery even with curettage method when possible.

## الخلاصة

**الخلفية:** عملية استاصال الغدانيات هو تداخل جراحي يتم من خلاله استئصال النسيج اللمفاوي في الحجرة خلف الانف .تقليديا يتم ذالك باستخدام المجرفة.

**الاهداف:** تهدف هذه الدراسة للمقارنة بين الطريقة التقليدية باستخدام المجرفة والطريقة النا ظورية في استئصال الغدانيات .

طريقة العمل: خلال الفترة من ايلول ٢٠١٠ الى تشرين الاول ٢٠١١ ،خضع ٤٠ مريض لعملية استئصال الغدانيات،١٦ من الذكور و ٢٤ من الاناث .تم تقسيم المرضى الى مجموعتين كل مجموعة تشمل ٢٠ مريض.المجموعة ( أ )اجريت لهم عملية استئصال الغدانيات بالطريقة التقليدية والمجموعة (ب ) اجريت لهم العملية بالطريقة الناظورية عبر الانف .المعاير التي تم دراستها هي : وقت العملية ،دقة

الازالة ،الاضرار للانسجه المحيطه ،العقابيل بعد العملية و استجابة المرضى. تم استثناء كمية الدم المفقود اثناء العملية والالم بعد العملية وذالك كون اغلب المرضى قد اجريت لهم ايضا عملية استئصال اللوزتين.

**النتائج:** بعد فترة من المتابعه كان وقت العملية في المجموعه أ (١٠-٣٥) دقيقه وفي المجموعه ب (٢٠-٩٠) دقيقه اي ان الوقت اطول بالطريقة الناظورية.الكفائه كانت افضل بالمجموعة ب في حين المجموعة أ احتوت على ٤ مرضى (٢٠%) كان لديهم بقايا انسجة لمفاويه بعد العملية.الاضرار المحيطة كانت في ٣ مرضى من المجموعة أ (١٥%) و ٥ مرضى من المجموعة ب (٢٥%) ،معضم هذه الاضرار كانت بسيطة فقط مريضين اثنين خضعو لفتيلة الانف .الالتهابات بعد العملية حصلت في حاله واحده في كلتا المجموعتين (٥%).

عدم كفاءة اللهاة حصات في حالتين من المجموعة أ (١٠%) وثلاث حالات من المجموعة ب (١٥%).جميع هذه الحالات كانت وقتية و المرضى اكتسبو الشفاء بدون اي تداخل .بقايا شاش حصلت في حالة واحدة من المجموعة ا ولم تحصل في المجموعة ب .النسبة الكلية لحدو ث العقابيل في المجموعة ا هي ٥٥% وفي المجموعة ب هي ٤٥%.

**التوصيات:** الطريقة الناظورية لاستئصال الغدانيات هي طريقة أمينة وفعالة بشكل اكبر من الطريقة التقليدية طالما انها تمكن الجراح من العمل بمدى رؤيا مباشر و بسيطرة اكبر ولاكنها تحتاج الى مهاره وتدريب.

## The Aim of the study

To compare between conventional and endoscopic –assisted adenoidectomy regarding safety and efficiency.

## Patients and Methods

The present study was carried out in Babylon teaching hospital .To achieve the objectives of study ,a prospective randomized trial was designed .Fourty 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[1,9] where:

Grad I : adenoid tissue filling one third of the vertical height of of Choana.

Grad II : up to two third

Grad III :from two third o 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-trachial 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 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.

The obtained data was compared between the two groups and statistically analysed using paired t-test.

## The questionnaire

Name: age: sex:
phone
Chief complaint:
Nasal obstruction :---
Snoring:---
Mouth breathing:---
Discharge: -anterior:---
Posterior:---
Poor appetite :---
Sleep disturbance:---
Ontological symptoms -otalgia:--
Deafness:---
Assessment: cotton test:---
Ear examination:---
XR:
Fiberoptic:
Procedures:
-adenoidectomy : conventional Endoscopic:
-associated procedures:
Mean time:----
Complications:
Haemorrhage:-primary:---
Secondary:---
Remnant:
Hpernasality:
Trama:
Results:
persistence of symptoms:
relief of symptoms:
Follow up period:

## 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, Adenotosillectomy, Adenoidetomy with bilateral myringotomy as shown in figure 1.

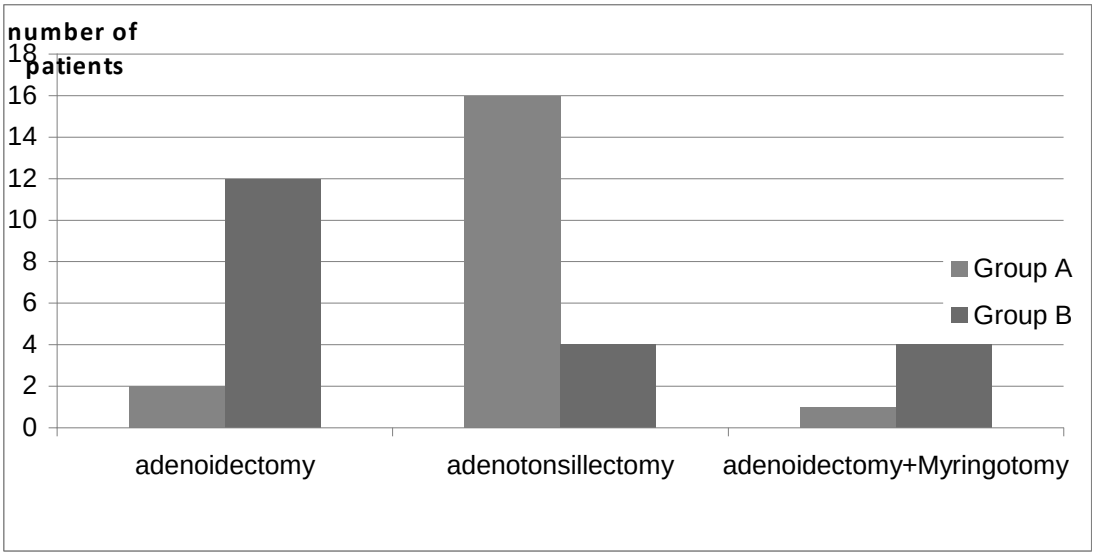


**Figure 1** surgery performed in the three groups.

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

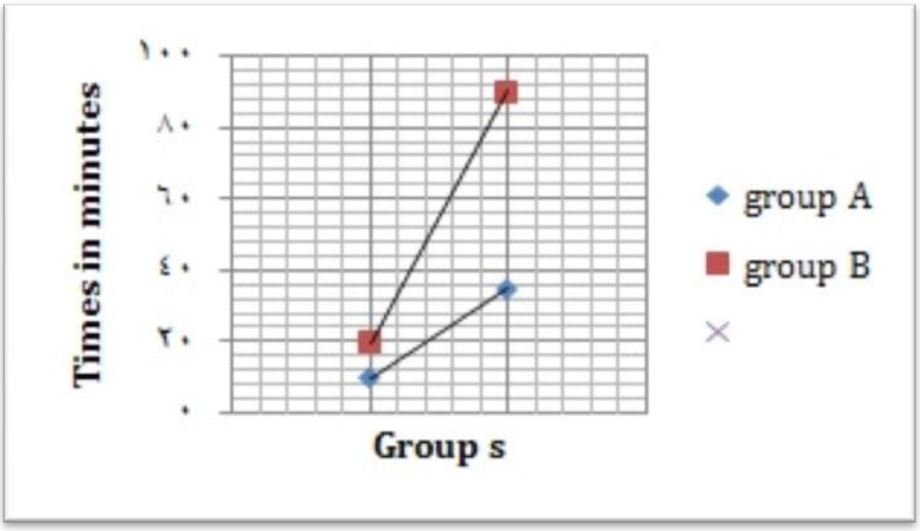


**Figure 2**

The predominant indication for adenoidectomy was sleep- disordered breathing as shown in figure 3.

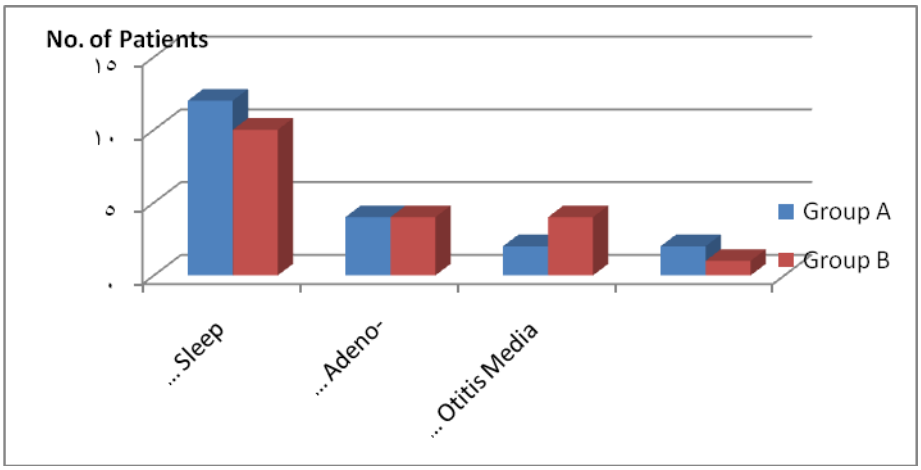


**Figure 3.** Indication of Surgery in the two groups.

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

**Table 1** percentage of symptom

| Symptoms | Number | percentage |
|---|---|---|
| Nasal obstruction | 8 | 20% |
| Sleep disturbance | 23 | 57.5% |
| Otological symptoms | 6 | 15% |
| Discharge | 3 | 7.5 |
| Epistaxis | 0 | 0 |

The post-operative fiber-optic nasendoscopy to look for residual adenoid tissue showed that resection was almost complete in Group B whereas 4 cases (20%) of Group A had residual adenoid tissue .The fiber-optic nasendoscope also used to look for associated trauma ,in Group A 3 cases (15%) had trauma ,all are minor involving the uvula and posterior pharyngeal wall whereas in Group B trauma occurred in 5 cases (25%) ,3 were minor septal mucosal injuries while 2 cases (10%) were major required anterior nasal packing .

Velopharyngeal dysfunction causing hyper nasal speech without nasal regurgitation developed in 2 cases (10%) of Group A and 3 cases (15%) of Group B ,all were temporary resolved spontaneously within a week. Infection occurred in 1 case (5%) of each Groups .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.
The over all complication rate in Group A was 55% whereas in Group B 45%.

**Table 2 :**Tabular comparison of the two methods.

| parameter | Conventional adenoidectomy | Endoscopic –assited adenoidectomy | Remarks |
|---|---|---|---|
| Operating time | 23.25 minutes | 42.75 minutes | P<0.001 |
| Remnant | 20% | None | P<0.035 |
| Associated trauma | 15% | 25% | Not significant |
| Velopharyngeal dysfunction | 10% | 15% | p>0.05 |
| Infection | 5% | 5% | p>0.05 |
| Retained swab | 5% | none | not significant |

## Discussion

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

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

Adenoidectomy also form an an important treatment option for otitis media with effusion ,recurrent adeno-tonsilltis and pediatric chronic rhino-sinusitis .It is conventionally performed using curettage method which is a blind procedure with possible damage to Eustachian tube orifices and not provide a complete removal of all adenoid tissue which in the long term may lead to recurrence .[4,5,6,7]

The advent of endoscope improved access to the nasopharynx and now it is possible to performed 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 instrument ,packing and securing the haemostasis .The increase in operating time in the endoscopic method is probably related to increased setting time ,endoscopic visualization ,bite by bite removal of adenoid tissue . The increase in time add about 20 minutes to surgery and greatly influenced by surgeon experience .This study notes a gradual improvement in operating time from first to last patient as experience improved.

Our findings are in contrast to those by Stanislaw et al [5] and Feng Y. et al [6] who have reported powered adenoidectomy to be 20 % faster than curette adenoidectomy .

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

In contrast ,our finding 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 consume more time which can be reduced with experience .
It has been noted that the extent of resection following conventional method was incomplete which may lead to recurrence of the condition .This study included one patient who had operated upon three years ago using curette adenoidectomy and now presented with recurrence of symptoms with Grad III adenoid .
This patient underwent another surgery using endoscopic method with good result. Also 4 patients of those underwent conventional adenoidectomy had remnant 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 .[1,13]
In the endoscopic adenoidectomy ,the nasopharynx can be seen properly and any remnant of adenoid tissue can be removed under direct vision .this make endoscopic technique more accurate .This finding is consistent with those reported by Rakesh Datta , Stanislaw P and Koltai PJ .[4,5,7,]
Associated trauma is a frequent finding following adenoidectomy .In Group A there is a possibility of trauma to Eustachian tube orifice leading to scaring and dysfunction ,whereas in Group B there is 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 few days .
The post-operative pain was not assessed because the majority of patients underwent additional tonsillectomy and it is difficult to appreciate ,in child patent , 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 less 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 constraint .
4- endoscopic technique need experience and availability of the equipments.
On the other hand endoscopic method has an important role in selected patients such as those with cleft palate and other craniofacial anomalies for them adenoidectomy was avoided because of risk of velopharyngeal dysfunction .An accurate removal using endoscope and microdebrider enable surgeon to carefully excise part of adenoid and the velopharyngeal sphincter untouched .
In this study adenoids were identified in 5 adult patient all underwent endoscopic removal since access is better than that in children .Adenoid can persist to adulthood and it is suggested that adenoid tissue in adult has some histological differences from that in children, being reactive rather than inflammatory and adenoidectomy under trans-nasal control is safe and reliable.[8]This group of patients are 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:** result of major publish series

| The author | Date | Findings |
|---|---|---|
| Stanislaw P, Koltia PJ | 2000 | Powered adenoidectomy provid faster,dryer,more complete resection with less blood loss . |
| Rakesh Datta | 2009 | Powered adenoidectomy is safe ,effective,with less blood loss,less trauma but more operating time. |
| Reda H.Kamel | 1990 | 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. |

**This present study has some limitations such as :**

1-short period of follow up as any new technique need longer period to assess their efficacy in the long term.

2- small number of patients included in this study as it is take longer operating time and many surgeons still favor conventional method in a matter of lesser operative time .

3- any endoscopic surgery need strict co-operation with anesthetist who should has experience with pediatric anesthesia to provide a bloodless field .

4-this technique require experience and different sizes equipments to deal with small and narrowed nasal cavity found in children.

## Conclusion

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.

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 made digitally prior to curetting the adenoid ,a pre- operative fiberoptic 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 these group provide a wider access for introduction of endoscope .

4-The longer operating time is a cheep 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.

Even if procedures is done using the curettage method ,it is recommended to do it under endoscopic guide when possible.

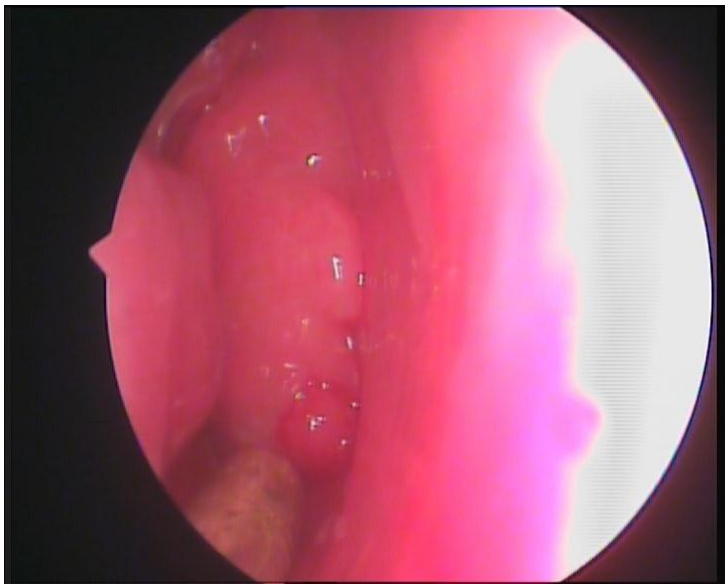

**Figure 4**. Choanal adenoid

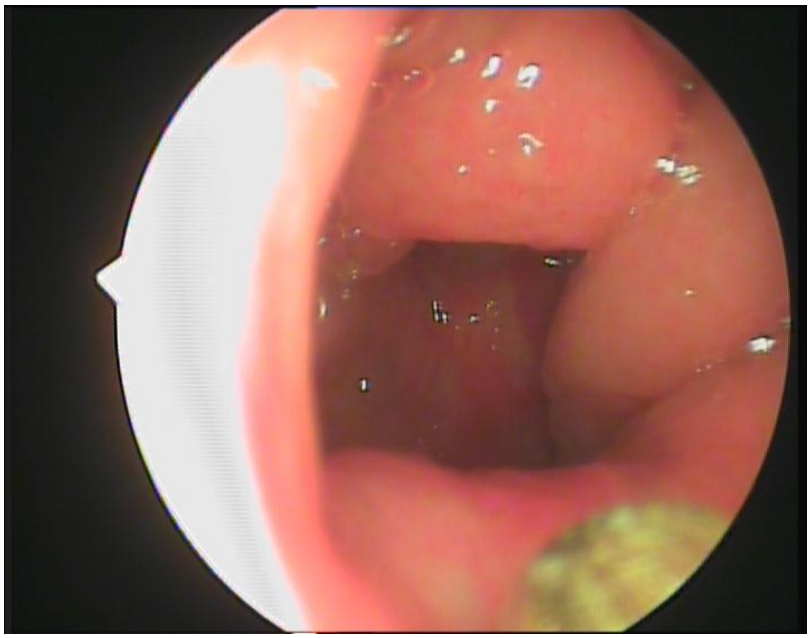

**Figure 5** post-operative view following conventional method

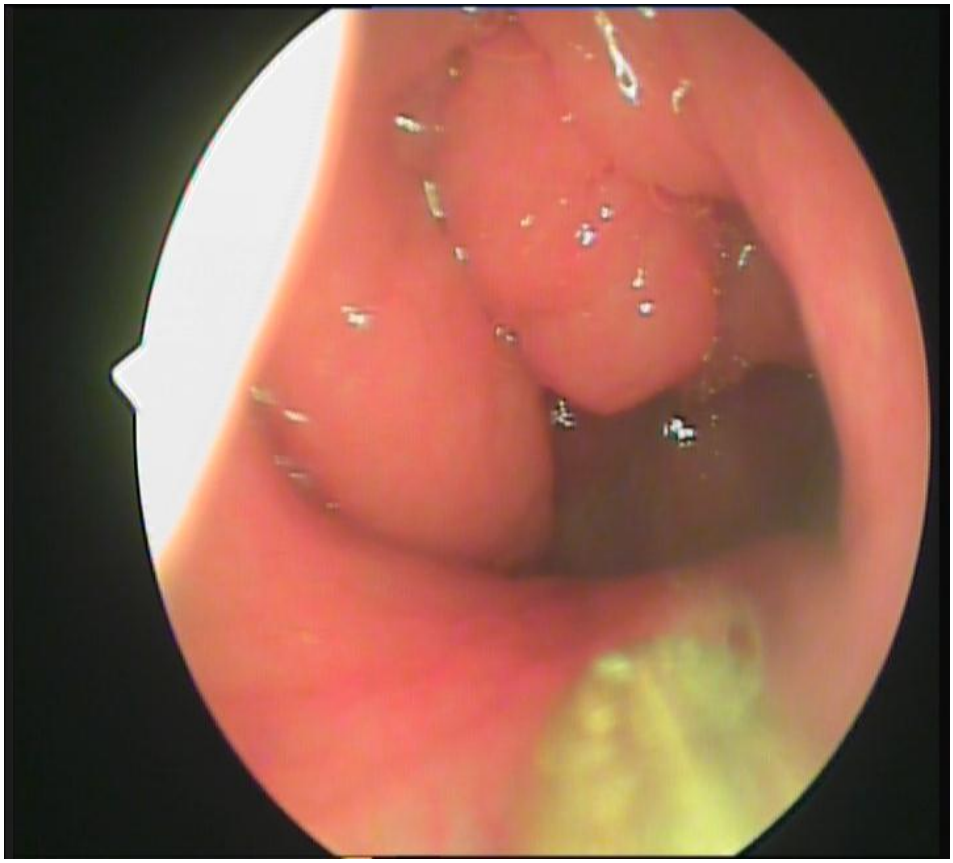

**Figure 6** post-operative view following conventional adenoidectomy (same patient on other side)

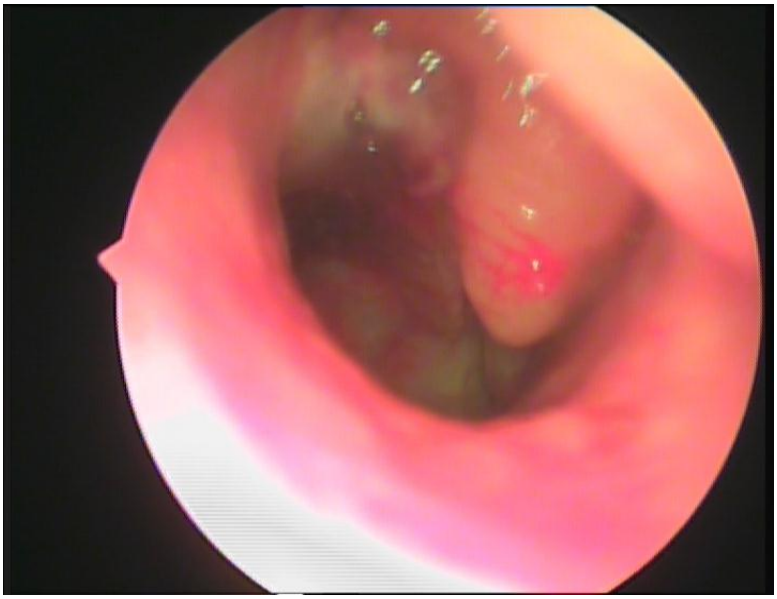

**Figure 7**.post-operative view following endoscopic method.

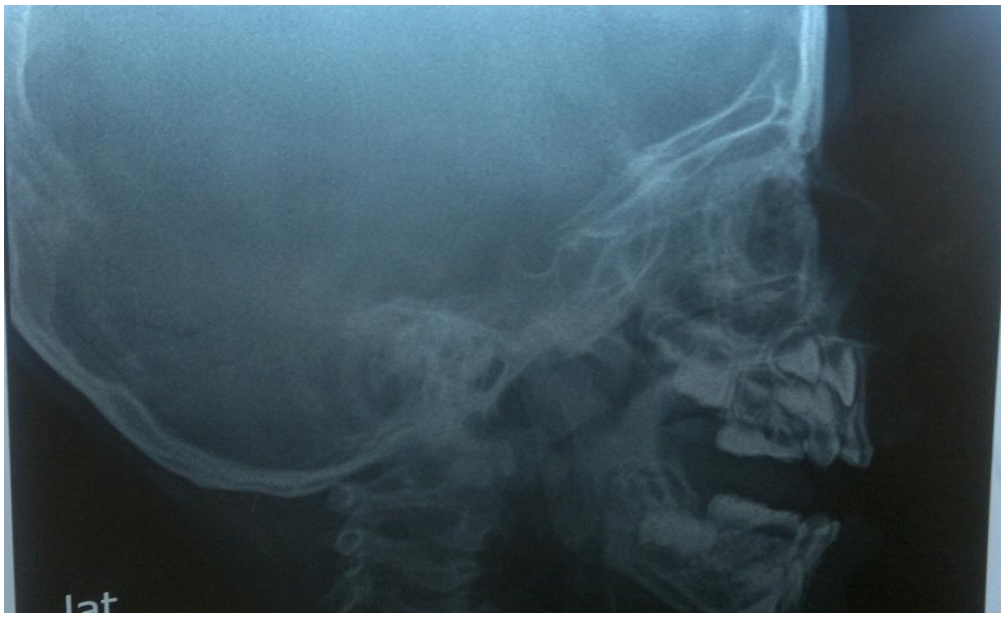

**Figure** 8 Lateral soft tissue view of nasopharynx (shows n enlarged adenoid )

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