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**RESEARCH ARTICLE**

# A STUDY TO EVALUATE COMBINED APPROACH OF ENDOSCOPY GUIDED CONVENTIONAL ADENOIDECTOMY

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**ABSTRACT**

**Background:** Adenoidectomy is one of the most common surgical procedures performed by Otorhinolaryngologists in the paediatric population. Most commonly used method for adenoidectomy being digital palpation of adenoids followed by their blind curettage using adenoid curette. This leads to incomplete removal of adenoids and also has risks of injuring surrounding structures. Objective of our study was to evaluate the role of intra-operative endoscopic inspection of conventional adenoidectomy. **Methodology:** Eighty patients attending ENT OPDs at Chigateri district hospital and Bapuji hospital, teaching hospitals attached to our institute during the period from October 2016 to October 2018 with symptoms and radiographic evidence of enlarged adenoids and who fulfill all inclusion and exclusion criteria and are willing to participate in the study were selected, informed and written consent was taken from all cases. A thorough clinical examination and required investigations were performed and diagnosis of enlarged adenoids was made. Patients were operated by Conventional adenoidectomy, followed by visualization and removal of remnants in the nasopharynx using a rigid endoscope. The number of patients benefited with remnants removal was noted. **Results:** The mean age of patients in our study was 8.8 years with male preponderance. Most common presenting complaints were mouth breathing, nasal obstruction, and snoring. Adenoidectomy with tonsillectomy was the most common procedure performed. Adenoid remnants were detected using endoscopic visualization in 92.5% of the cases in our study, with nasopharyngeal roof being the most common site. **Conclusion:** Endoscopic assisted adenoidectomy allows complete removal of adenoid tissue there by reducing the chances of developing recurrent adenoid, obstructive symptoms and reducing the bacterial reservoir in the nasopharynx.



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# INTRODUCTION

Adenoidectomy is the most common major surgical procedures performed in children by otorhinolaryngologists (Derkay, 1993). Over the last 20 years there has been a shift in the presentation of adenotonsillar disease in children. Initially recurrent throat infections were the predominant reason for an adenotonsillectomy, now evolved due to increasing recognition of the role of adenotonsillar hypertrophy in sleep-disordered breathing (SDB) in children & having dramatic effect on children's quality-of-life, behaviour and school performance (Mitchell, 2006; Jeyakumar). Adenoid hypertrophy has been associated with allergic rhinitis; otitis media due to its anatomical relationship in proximity to eustachian tube either causing its obstruction or by harbouring bacterial infections when enlarged; higher prevalence of SDB and increased incidence of lower respiratory infections (Jeyakumar). Adenoidectomy is most commonly done conventionally using adenoid curette, performed by blind digital palpation and removal of adenoids.

Endoscopic aided adenoidectomy is the recent advancement of classic curettage adenoidectomy with good direct vision of the nasopharynx that enables the surgeon to completely remove the adenoid tissue and avoid injury to surrounding important structures (Amr, 2009).

# METHODOLOGY

A prospective study was conducted on 80 patients undergoing adenoidectomy in the Department of Otorhinolaryngology at Bapuji Hospital and Chigateri District Hospital attached to J.J.M Medical College, Davanagere from October 2016 to October 2018 after taking institutional ethical committee clearance. Patients with symptomatic enlarged adenoids were selected, diagnosed using thorough history, clinical examination and investigations; fulfilling the inclusion & exclusion criterias & informed written consent taken. Diagnosis of enlarged adenoids was confirmed on X ray nasopharynx soft tissue lateral view. The patients were operated with endoscopy assisted adenoidectomy. All patients received a course of antibiotics post-operatively for 5 days. The patients were discharged when fit and were strictly followed-up on 1st and 2nd weeks, from the date of surgery. The patients and informants were asked for relief of symptoms by taking Visual Analogue Scale score 2weeks after surgery. Patients diagnosed with hypertrophied adenoids causing snoring, mouth breathing, sleep apnea syndrome or speech abnormality or recurrent otitis media were included in the study. While those with bilateral inferior turbinate hypertrophy, cleft palate or submucous palate, bleeding or coagulation defects, acute infection of upper respiratory tract, grossly deviated nasal septum with compensatory turbinate hypertrophy were excluded from the study.

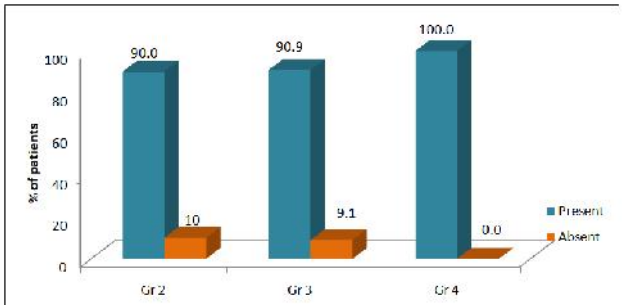
# METHOD OF SURGERY

After the patient is induced with general anaesthesia, orotracheal intubation done, Rose's position was given to the patient and Boyle Davis mouth Gag inserted. Followed by local decongestion in nasal cavity using xylometazoline drops. The nasopharynx was then inspected using 00 or 300 rigid nasal endoscope of 2.7 or 4 mm diameter. The size and extent of adenoids was noted and adenoids removed using conventional curettage. Followed by reinspection of nasopharynx with the endoscope to rule out remnants. If remnant tissue is seen, the subsite was noted and it was removed using 450 Blakesley forceps. The nasopharynx was then packed with sterile gauze and haemostasis achieved. And again nasopharynx inspected endoscopically (Fig 1).Time required for procedure and complications were documented. Such 80 patients were taken into study, and number of patients benefited with remnants removal was calculated. Statistical analysis was done using SPSS (version 17) software. A p value of 0.05 or less was considered as statistically significant.

# RESULTS

A total of 80 patients were taken in our study, and the results analysed for the same .The age of the patients ranged from 4 years to 14 years. The mean age ± SD calculated was 8.8 ± 2.8years. In our study the incidence of adenoidectomy was more amongst males. Amongst 80 patients (100%), 42 patients (52%) were male and 38 patients (48%) were females. Mouth breathing was the most common presenting symptom, which was seen in 77 patients (96.2%). Second most common symptom was nasal obstruction, seen in 76 patients (95%). Snoring was also a common symptom encountered, seen in 73 patients (91.2%).

Other less common symptoms seen were- throat pain, nasal discharge, hearing loss, ear discharge and voice change. Maximum patients in our study were diagnosed as chronic adenotonsillitis, which was seen in 51 patients (63.8 %). While, 15 patients (18.8 %) were diagnosed with chronic adenoiditis. Otitis media with effusion was seen in 13 patients (16.2%) and recurrent acute otitis media was diagnosed in a single patient (1.2%). All 80 patients (100%) in our study underwent adenoidectomy with or without other procedure. Adenotonsillectomy was performed in 51 patients (63.8%). While, 16 patients (20%) underwent only adenoidectomy. Adenotonsillectomy with grommet was carried out in 10 patients (12.5%) and adenoidectomy with grommet insertion done in 3 patients (3.8%). Pre-operatively, maximum number of patients in our study were found to have Grade 3 adenoids, as seen in 55 patients (55%). Grade 4 adenoids were found in 15 patients (18.8%), while Grade 2 adenoids were found in 10 patients (12.5%). In our study, remnants were found after conventional curettage in 74 patients (92.5%), while only 6 patients (7.5%) were without any remnants. Presence of post conventional adenoidectomy remnants was correlated with pre-operative grades of adenoids. Remnants were found to be in increasing percentage of patients with increasing grade. The relation between grades of adenoids and post conventional curettage remnants was found to be statistically insignificant (Graph/Table-1).




**Graph/Table 1: Post Conventinal Adenoidectomy remnants in relation to Pre-op Grades of Adenoids**

**Graph/Table 2. Site distribution of remnants**

| Site of Remnants | Frequency | Percentage |
|---|---|---|
| Nasopharyngeal Roof | 49 | 66.2 |
| Peritubal | 7 | 9.5 |
| Nasopharyngeal Roof + Peritubal | 15 | 20.3 |
| Nasopharyngeal Roof with Posterior Nasopharyngeal Wall | 3 | 4.0 |
| Total | 74 | 100 |

**Graph/Table-3. Visual Analogue Scale scoring for symptoms**

| VAS | Pre-op | | At 2weeks followup | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| 1 – 2 | 0 | 0.0 | 76 | 95.0 |
| 3 – 4 | 0 | 0.0 | 4 | 5.0 |
| 6 – 7 | 13 | 16.3 | 0 | 0.0 |
| 8 – 9 | 67 | 83.8 | 0 | 0.0 |
| Total | 80 | 100.0 | 80 | 100.0 |

Adenoid remnants were noted at various sites post conventional curettage. Highest number of patients showed remnants at nasopharyngeal roof which was in 49 patients (66.2 %).

**Graph/Table 4. Correlating mean VAS score before and after endoscopy assisted adenoidectomy**

| | Pre-op | At 2weeks follow up | Mean reduction | T | Significance |
|---|---|---|---|---|---|
| Mean VAS±SD | 8.3 ± 0.8 | 1.2 ± 0.6 | 7.1 | 72.15 | P < 0.001,HS |
| Range | 6 – 9 | 1 – 4 | | | |

**Figure 1. Intra operative pictures showing Grade 3 adenoids, Adenoid remnants post conventional curettage & Removal of remnants using Blakesley $45^0$**

While, other sites included peritubal region and posterior nasopharyngeal wall (Graph/Table-2). Mean operative time required for endoscopy assisted adenoidectomy was 13.28 mins. Average of hospital stay in our patients was 1.9 days. Visual Analogue Scale score for symptoms in patients before surgery ranged from 6 to 9. While, the same score in post-operative period ranged from 1-4 (Graph/Table 3).Mean VAS score in pre-operative assessment was 8.3 and it was 1.2 at 2 weeks follow up. The mean reduction in score was 7.1, which was highly significant on statistical analysis **(**Graph/Table-4).

# DISCUSSION

Adenoidectomy is one of the most common procedures performed by otorhinolaryngologists in paediatric population worldwide (Curtin, 1987). Various techniques being used for adenoidectomy now a days range from conventional curettage adenoidectomy, adenoidectomy with visualization through an angled mirror or endoscope, to power assisted adenoid removal (Amr, 2009). According to a study by, G Dhanasekar *et al*, most commonly used procedure for adenoidectomy is conventional curettage (Dhanasekar, 2010). Conventional curettage adenoidectomy misses a substantial amount of adenoid tissue. Rigid endoscopy-assisted adenoidectomy improves this result by enabling localization of any residual adenoid tissue as shown in a study by D Regmi *et al*. (2011) We performed this study with the aim of evaluating the aid of endoscopy, during conventional adenoidectomy, in ensuring complete removal.

## DEMOGRAPHIC DATA

**Age distribution:** In our study, youngest patient was of 4 years age and eldest patient was of 14 years age (range 4-14 years). The mean age of the patients was 8.8 years. Maximum number of patients in our study aged between 6 to 10 years. A similar age distribution was observed in a study by Regmi *et al*, with mean age 8.83 years and most patients in their study were in the range 7 to 12 years (Regmi *et al*., 2011). Also in a study by Yavuz Selim Yildirim *et al*, the mean age was 7.7 years. In their study, the age of patients ranged from 3 to 15 years (Yavuz Selim Yildirim, 2004).

**Sex distribution:** In our study, 52% were male patients and 48% female patients. The male to female ratio calculated was 1.08:1, which was comparable to that seen in a study by which had sex ratio of 1.56:1 (Regmi, 2) (Regmi, 2011). In a study by Huseyin Yaman *et al*, 34 males (55.73%) and 27 females (44.27%) were present (Huseyin Yaman, 2015). In a study by Yavuz Selim Yildirum *et al*, out of total 76 patients in their study, 44 (57.9%) were male patients and 32 (42.1%) were female patients (Yavuz Selim Yıldırım, 2014).

## DIAGNOSIS

In our study, most common symptom seen amongst the patients was mouth breathing, which was seen in 77 patients (96.2%). The next common symptom was nasal obstruction, in 76 patients (95%), followed by snoring seen in 73 patients (91.2%). Throat pain, nasal discharge, hearing loss, ear discharge and voice change were less commonly associated symptoms. In a study by D Regmi *et al*, similar incidence of symptoms was noted, with snoring being the most common symptom seen in 97.1% of their patients, followed by nasal obstruction in 95.1% and mouth breathing in 85.6 % patients. Other symptoms noted in their study included, sore throat, ear ache, sleep apnea, hearing loss, nasal discharge, ear discharge, voice change and epistaxis **(**Regmi, 2011). Most common diagnosis made in patients in our study was chronic adenotonsillitis followed by chronic adenoiditis.

**Type of surgery:** All 80 patients (100%) in our study underwent adenoidectomy with or without other procedure. Adenotonsillectomy was performed in 51 patients (63.8%). While, 16 patients (20%) underwent only adenoidectomy. Adenotonsillectomy with grommet was carried out in 10 patients (12.5%) and adenoidectomy with grommet insertion done in 3 patients (3.8%). In a study by Regmi D *et al*, the most common surgery performed was adenotonsillectomy (n=32), adenotonsilletomy with ventilation tube insertion (n=6) and isolated adenoidectomy was done in only one patient (Regmi, 2011).

**Hospital stay:** Average hospital stay of patients in our study was 1.9 days that is approximately 2 days. It was 3 to 5 days in a study by D Regmi *et al*. (2011)

**Grades of adenoids:** Maximum number of patients in our study were found to have Grade 3 adenoids, as seen in 55 patients (55%). Grade 4 adenoids was found in 15 patients (18.8%), while Grade 2 adenoids were found in 10 patients (12.5%). Graph-6 shows distribution of various grades of adenoids in the patients. In a study by Yavuz Selim Yildirum et al, Grade 4 adenoids was present in 43.4% of their patients. While, Grade 3 adenoids in 28.9% patients and Grade 2 adenoids in 25% of their patients (Yavuz Selim Yıldırım, 2014).

**Adenoid remnants:** In our study, remnants were found after conventional adenoidectomy in majority of the patients (92.5%), while in 6 patients (7.5%) complete removal of tissue was seen. In a study by Ahmed Hesham *et al*, the residual tissue post conventional curettage was seen in 82% patients and as high as 95.45% in a study by Elnashar *et al*. Residual tissue was seen in less patients comparatively in a study by Pagella *et al* (50%) and Abdel Aziz (20.5%) (Ahmed Hesham, 2014; Elnashar, 2014; Pagella; Abdel-Aziz, 2012).

The relation between grades of adenoids and post conventional-curettage remnants was analyzed and found to be statistically insignificant. Amr El-Badrawyin his study of transoral endoscopic adenoidectomy, concluded that transoral endoscopic adenoidectomy is the recent advancement of classic curettage adenoidectomy with direct vision of the nasopharynx that enables the surgeon to avoid injury of important structures as Eustachian tube orifices, and also it gives him the chance to completely remove the adenoidal tissue (Amr, 2009). Huseyin Yaman did a study to compare transoral/transnasal endoscopic guided adenoidectomy with endoscopic nasopharyngeal inspection at the end of curettage adenoidectomy and concluded that Transnasal endoscopic examination at the end of curettage adenoidectomy is an appropriate method to assess the residual adenoid tissue after conventional curettage adenoidectomy (Amr, 2009). As stated in a study by Hung-Meng Huang *et al*, in case of large adenoids, endoscopic removal requires more time than conventional adenoidectomy, which prolongs the need for anesthesia and hence the risks. Hence, in such patients, conventional method can remove the main bulk before endoscopic removal of remnants, thus reducing the operative time (Hung-Meng Huang, 1998).

**REMNANTS SITES:** The most common site for remnants in our study was nasopharyngeal roof as seen in 61.3% patients, followed by both in nasopharyngeal roof and peritubal area in 23.7% patients. Less commonly seen in peritubal region alone (11.2%) or involving the posterior nasopharyngeal wall (3.8%). Our findings were similar to that seen in a study by Ark *et al*, where most common site for adenoid residual tissue post conventional curettage was nasopharyngeal roof (81%) followed by around the torus tubarius (11.4%) (Ark, 2010). While in a study by Ahmed Hesham *et al*, Peritubaric region was the most common site for adenoid remnants as seen in 38.7% cases and in a study by D Regmi *et al*, superomedial choanae being the most common site for remnants (Regmi, 2011; Ahmed Hesham, 2014).

**Symptom relief at follow up:** In our study, the mean symptoms score using Visual Analogue Scale, at presentation was 8.3 and post surgery it was 1.2 which was highly significant with mean reduction of 7.1. Similar scale was used in a study by Y M Wan *et al*, for snoring in patients with enlarged adenoids, which showed significant improvement from 8 preoperatively to score of 1 postoperatively (Wan, 2005).

## CONCLUSION

Endoscopy assisted conventional adenoidectomy assures high level of precision in removal of adenoids completely. Also, this combined approach reduces operative time as compared to endoscopic removal alone (especially in large adenoids). Residual tissue is observed after most conventional adenoidectomies, which can further lead to recurrence, Eustachian tube dysfunction and foci for bacterial growth which can be avoided by combining it with endoscopic removal. Cost of equipments should be weighed against possibility of recurrence. With easy availability of endoscopes nowadays, it can be definitely utilized for assuring a complete surgery especially in view of rising medico-legal constraints.

**Conflict of interest**: There is no conflict of interest

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