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# TO STUDY THE ROLE OF ENDOSCOPIC EVALUATION OF NASOPHARYNX AND MICRODEBRIDER ASSISTED RESIDUAL TISSUE REMOVAL FOLLOWING CONVENTIONAL ADENOIDECTOMY

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ABSTRACT

The study was aimed to evaluate endoscopically the size of residual pathology following conventional adenoidectomy and to identify the sites of residual adenoid tissue intraoperatively as well as to remove any residual tissue with microdebrider which may lead to recurrence of symptoms, thus avoiding revision surgeries. Patients were followed up for 1 year to check for any post-operative complication.

This work was done on 60 cases with clinical features of adenoid hypertrophy. X-Ray soft tissue nasopharynx lateral view was done according to classification given by ***Fujioka et al*** to confirm radiological findings of adenoid size. Further, it was compared with the findings of preoperative nasal endoscopy according to a scale given by ***Clemens and McMurray*** to confirm the size of adenoid. Adenoidectomy was initially performed by conventional curettage method which leads to residual tissue, intraop endoscopy was done to check the size of residual tissue according to ***Wang et al*** classification. Attempts were made to correlate the findings.

## INTRODUCTION

Adenoid or Nasopharyngeal tonsil is the most cranial part of Waldeyer's ring. It is an amassment of lymphoid tissue, situated at the junction of the roof and posterior wall of the nasopharynx, as initially described in 1868 by Meyer[1]. It develops from a subepithelial infiltration of lymphocytes after 4-6 weeks of gestation. Superiorly it is confined by sphenoid bone, sideways by fossa of Rosenmuller, nasopharyngeal end of eustachian tube and lateral pharyngeal wall, posteriorly by pharyngobasilar fascia and inferiorly by passavant's ridge[2]. It produces B-cells, which generate IgA and IgG plasma cells. Introduction of antigens through the nasal route is an essential part of natural acquired immunity in early childhood. The adenoid has a vital part in the upgrowth of 'immunological memory' in early childhood[3]. The excision of adenoid at a budding age is immunologically undesirable[4]. Adenoid enlargement may cause nasopharyngeal obstruction and further complications such as repetitive sinusitis, eustachian tube dysfunction leading to otitis media, snoring or sleep apnoea syndrome[5]. This chronic nasal blockage causes decreased sensation of taste and smell, denasal speech and sometimes even craniofacial abnormalities[6].

Adenoid Hypertrophy leads to unnatural appearance of the face, known as adenoid facies. Various signs of adenoid facies are prominent upper central incisors, pinched in nose, high arched palate, hitched up upper lip, an elongated, dull and expressionless face, hypoplastic maxilla and mouth breathing[7]. George Catlin, in his enlightening book Breath of Life[8], illustrated adenoid facies in many engravings and advocated nose breathing[9] which was published in 1861.

Surgical resection (Adenoidectomy) is recommended if the volume of adenoids obstruct the nasopharynx in such a way that produces respiratory, auditory or infectious complications before any growth or developmental delay occur.

Adenoidectomy is the second most common surgical procedure performed on children nowadays, on alone or in association with tonsillectomy or with grommet insertion[10]. The most common and conventional adenoidectomy method as described in 1885[1] is blind peroral excision of the adenoid tissue with an adenoid curette or adenotome[5,11]. This method has various complications like excessive bleeding, residual adenoid tissue, eustachian tube closure and nasopharyngeal fibrosis. These can be avoided by clear cut resection of adenoid tissue while saving other structures of the nasopharynx.

Any amount of residual tissue may lead to post operative bleeding, peritubaric obstruction, act as bacterial reservoir and cause choanal obstruction[12]. This highlights the importance of complete removal of adenoid tissue.

Dissatisfaction with conventional technique has led to the development of alternative adenoidectomy techniques such as use of endoscopes, diathermy along with suction, powered instruments and coblation in order to avoid such complications.

Powered instrumentation/Microdebrider precisely cuts the tissue, thus causing minimal trauma to normal mucosa thereby minimizing bleeding and post operative scarring. This being done under endoscopic guidance provides better visualization and illumination, thus ensuring complete clearance of obstructive adenoids with minimal complications.

The aim of our study was 'to study the role of endoscopic evaluation of nasopharynx and microdebrider assisted residual tissue removal following conventional adenoidectomy'.

## MATERIAL AND METHODOLOGY

The study was carried out in the patients attending ENT department OPD, MMIMSR, Mullana, Ambala with clinical features of adenoid facies (fig.1).

The study was undertaken from December 2016 to September 2018. 60 cases were taken up as per the given below criteria. Inclusion criteria for selection of patients was age group 04-18 year having clinical and radiological evidence of adenoid hypertrophy possesing symptoms of nasal obstruction, nasal discharge, post nasal discharge, voice change, ear ache, decreased hearing, delayed and defective speech, sleep apnoea, snoring and hyponasal speech. Features of Adenoid Facies (include prominent upper central incisors, pinched in nose, high arched palate hitched up upper lip, an elongated, dull and expressionless face, hypoplastic maxilla and mouth breathing).(Fig.1)

**(Fig.1) 6 year old child with features of Adenoid facies**

**Fig.2) Instruments Used for performing Conventional Curettage Adenoidectomy**

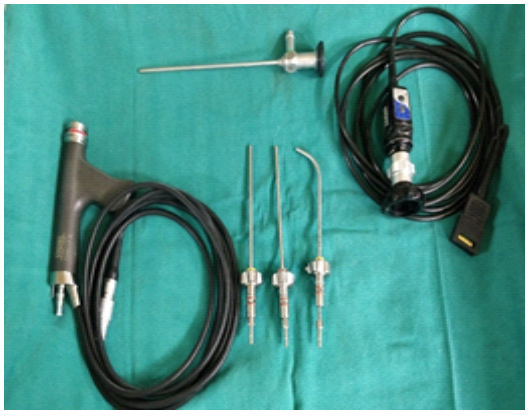

**Fig.3) Handpiece of Microdebrider with different blades for Adenoidectomy. Also 00 Endoscope with Camera**

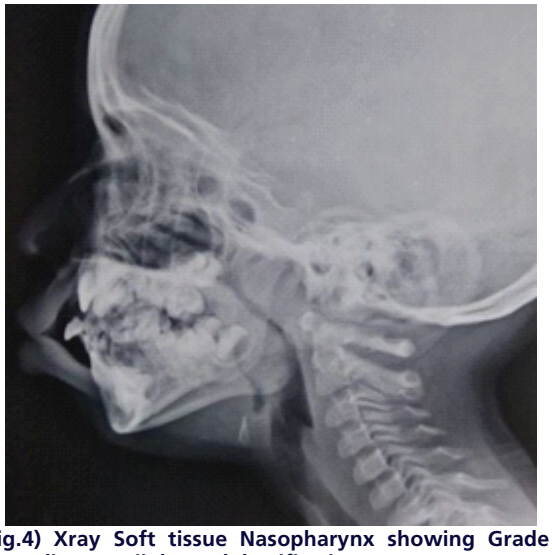

**Fig.4) Xray Soft tissue Nasopharynx showing Grade 3 according to Fujioka et al classification**

Exclusion criteria were age less than 4 years and more than 18 years. Patients with upper respiratory tract infection and with bleeding or coagulation defects were not included in the study. Patients with craniofacial abnormalities such as Cleft palate and Down's syndrome and past history of Adenoidectomy, were also not included in the study. Any suspicion of adenoid hypertrophy due to Lymphoma and any cervical anomaly or Anaesthetic contraindication, were excluded from the study.

X-ray soft tissue nasopharynx lateral view (Fig.4) was done to grade the adenoid hypertrophy as per the grading system given by Fujioka et al[13] which is as follows

**Grade 1-** distance between maximal bulge of adenoid and soft palate is more than 6mm.

**Grade 2-** distance between maximal bulge of adenoid and soft palate is 3-6mm.

**Grade 3 -** distance between maximal bulge of adenoid and soft palate <3mm.

Preoperatively nasal endoscopy (Fig.5) was done. The adenoid hypertrophy was graded according to scale as suggested by Clemens and McMurray[14] as given under:

**Grade I-** 1/3 vertical height of the choana filled with adenoid mass

**Grade II-** 2/3 vertical height of the choana filled with adenoid mass.

**Grade III-** 2/3 to nearly all, but not complete filling of the choana with adenoid mass.

**Grade IV-** Adenoid mass causing complete choanal obstruction.

After routine blood and urine investigations the selected patients were taken up for surgery for conventional adenoidectomy under general Anesthesia. The patient was placed in Rose position after orotracheal intubation. Boyle Davis mouth gag (Fig.2) was applied to keep the mouth open. St. Claire Thompson adenoid curette with guard (Fig.2) was introduced behind the soft palate to engage and shave off the adenoid tissue. 0° 4mm rigid fibreoptic nasal endoscope (Fig.3) was introduced via nose to examine the nasopharynx for any hypertrophied adenoid tissue left behind. The site and size of any residual tissue was examined.

The grading for size of residual adenoid tissue(Fig.6), in accordance to method given by Wang et al[15] in which estimation of the relative adenoid tissue was done as distance between the adenoid mass and vomer. The grading is as follows -:

1. If the distance between the adenoid mass and vomer is >1cm then it will be graded as small. (<1/3rd residual)

2. If the distance between the adenoid mass and vomer is 0.5-1cm then it will be graded as medium. (1/3rd-2/3rd residual)

3. If the distance between the adenoid mass and vomer is <0.5cm then it will be graded as large. (>2/3rd residual)

Any residual tissue found, was removed by powered shaver i.e. Microdebrider straight blade with cutting serrated edges (Fig.3 and Fig.8) introduced through opposite nasal cavity. Intraoperative nasopharyngeal packing was done for haemostasis.

**Fig.5) Preoperative DNE**

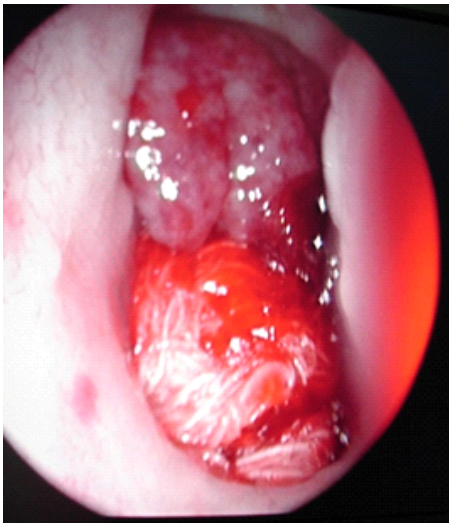

**Fig.6) Intraoperative DNE after conventional adenoidectomy**

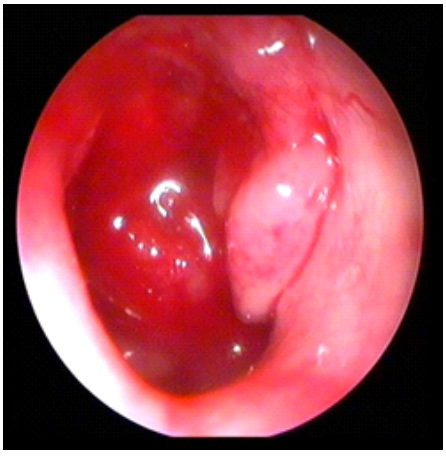

**Fig.7) Intraoperative final picture**

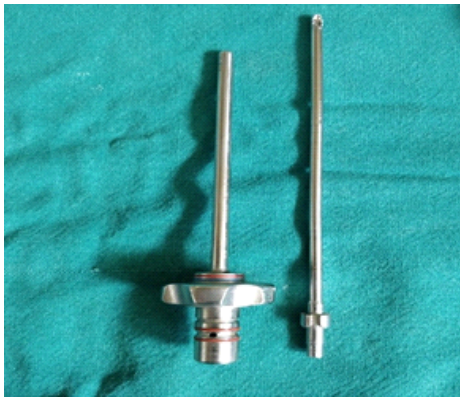

**Fig.8) Straight blade with serrated cutting edges.**

## RESULTS

The study was conducted on 60 patients. Of these patients, 39 were male (65%) and 21 were female (35%) with a ratio of 1.86:1. Their ages ranged between 4-18 years, 4-8 years being the commonest age group(50%). Nasal Obstruction (90%) was the most common presenting complaint followed by mouth breathing (88%), snoring (67%), fever (45%), nasal discharge (43%), obstructive sleep apnoea (17%) and decreased hearing (17%), post nasal discharge (12%) and hyponasal speech (7%). Signs of adenoid facies were noticed in 63.3 % of patients. According to x-ray soft tissue nasopharynx classification given by Fujioka et al grade 2(60%) was the most common. However, grade 3 was most frequently encountered in younger age group i.e. 4-8 years. According to preoperative nasal endoscopy findings grade 3(48%) was the most common. However, endoscopy was not possible in smaller age group (4-8 years) in 19 patients. According to classification given by wang et al[15], 1/3rd to 2/3rd residual tissue was the most common i.e. in 71.7% of patients and >2/3rd residual being the least encountered entity.

All the patients with grade 2 on x-ray shows grade 3 on nasal endoscopy. Moreover, all the patients with grade 3 on x-ray shows grade 4 on endoscopy. Out of 60 patients post op bleed followed by nasal packing was seen in 6 patients with the ratio of 1:10. After conventional curettage adenoidectomy, 100 % patients were found with residual adenoid tissue. Patients were followed up for period of 1 year, however no recurrence was seen in any of them.

## DISCUSSION

The study was done on 60 patients in the age of 4-18 years with clinical evidence of adenoid hypertrophy. They were subjected to nasal endoscopy and detailed radiological evidence for evaluating the nasopharyngeal area.

The vast comprehensive knowledge of pathophysiology and inflammatory conditions of adenoid hypertrophy, combined with accessibility of x-ray and advancement of endoscopically used instruments makes it necessary for the otorhinolaryngologist, to have concise mastery of anatomy of adenoid with their variation and diseases. Preop diagnostic nasal endoscopy in combination with x-ray soft tissue nasopharynx made decision of adenoidectomy precise, peculiar and well-reasoned. Microdebrider because of its magnificent response in resecting the adenoid tissue leaving behind no residual adenoid mass is the present-day choice for performing adenoidectomy.

Somani et al[16] suggested that nasal obstruction was the most common complaint in 90% of patients and also reflected the importance of postoperative nasal endoscopy to check thorough excision of hypertrophied adenoid mass chiefly in the region of intranasal protrusion and eustachian tube orifice. Mohammad R Dawood et al[17] studied in 80 patients with age group 4-12 years, grade 2 being commonest in 42.5% patients and most common age group affected was 4-8 years which was comparable to our study. Pruzansky et al[18] reported in his study that the maximum frequency was im the age group of 6 to 8 years, and this difference in the incidence was probably due to different culture and community lifestyle, as well as the socioeconomic status of the children. Parson SP et al[19] suggested power-assisted adenoidectomy which is completely administered through transnasal approach under endoscopic guidance. Lourenco et al[20] and Thadikonda et al[21] suggested that children possessing small size on X-ray soft tissue nasopharynx have medium size on nasal endoscopy and those having medium size on x-ray have large size on nasal endoscopy. These findings were seen in mouth breather. Hibbert J et al[22] suggested that X ray being a noninvasive procedure can be tolerated by children who cannot tolerate nasal endoscopy as well as it could give some assessment of the size of adenoid tissue in relation to the nasopharynx size. Saxby et al[23] and Regmi et al[24] studied that in 80% of cases residual adenoid tissue is left after conventional adenoidectomy technique. Approximately 20% left out mass was the mean percentage, typically in the choanal arch and peritubal regions. They inferred that palpation with finger is not a decisive method and examination of the nasopharynx intraoperatively is necessary for adequate removal of adenoid tissue. Elnashar et al[25] reported in a study that 95.45% patients undergoing curettage adenoidectomy (conventional) had residual adenoid mass on endoscopic examination. They also noted that more residual tissue was present in children of age 10 years or more. Anand et al[7] reported 100% complete removal by power-assisted method as comparable to conventional curettage method showing only 75% removal. They also suggested that the use of endoscopes (direct visualization) or mirrors (indirect visualization) would be useful for patients having otitis media with effusion (OME), for whom the fully excision of the peritubal adenoid tissue is essential for the benefits of surgery.

## CONCLUSION

We hereby conclude that in a case of adenoid hypertrophy, Powered instrumentation is a reliable tool for complete removal of adenoid tissue and pre-op nasal endoscopy is essential for

accurately diagnosing the size of adenoid. Such patients treated by conventional curettage method alone may never be relieved of symptoms and there are chances of recurrence.

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