

Original Research Article

# A study of Adenoid Facies: Clinico-radiological correlation and its sequelae

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## Abstract

**Introduction:** This study aimed to clinically correlate adenoid facies with various clinical features related to ear, nose and throat and to broadly study the various sequelae of adenoid hypertrophy on the physical, mental as well as the social conditioning of children.

**Materials and methods:** After taking approval of the institutional ethics committee the study was carried out in the department of Otorhinolaryngology and Head and Neck Surgery Netaji Subhash Chandra Bose Medical College and Hospital, Jabalpur from January 2012 till December 2012. Patients who presented to the outpatient clinic or were admitted in the indoor ward with adenoid facies were included in the study. After detailed history taking and clinical examination, data was analysed with appropriate statistical methods.

**Results:** 30 patients with adenoid facies of varying degrees were included in the study. Nasal block was the most commonly presenting symptom. Pain in throat was complained of by 66.66% of cases. In 50% of cases the parents complained of irregular dentition. Decreased airflow upon functional examination of the nose was seen to be bilateral in majority of cases. A hitched upper lip was found in 100% of cases. High arched palate was seen in all cases, grade III tonsil enlargement was seen in 63.33% cases while grade II tonsil enlargement was seen in 30%. It was seen that mastoid pneumatization was affected by adenoids, being partial cellular in 48.33% of the cases and sclerosed in 18.33% ears.

**Conclusions:** This study concluded that adenoids affect each part of ear nose and throat system, thus its effect can actually be quite devastating in growing children.

## Key words

Adenoids, Outcomes, Nasal obstruction, Nasopharyngeal.

## **Introduction**

Adenoid is a collection of lymphoid tissue in the mucous membrane overlying the basisphenoid area. It has an oblong shape, similar to that of a truncated pyramid. It in fact virtually hangs from the roof of the nasopharynx. The anterior edge of this tissue is vertical and lies in the same plane as the post-nasal aperture. Its posterior edge gradually merges into the posterior pharyngeal wall and its lateral edges incline towards midline. It is lined by ciliated columnar epithelium. The surface of adenoid has deep clefts, but no crypts or capsule like palatine tonsil. The adenoid normally enlarges during childhood between 3-4 years. This is a period during which the child is most prone to respiratory infections [1]. As the child grows older the adenoid regresses in size, may even disappear during puberty. The initial reduction in the size of adenoid has been attributed to the rapid enlargement of the nasopharynx when compared to the size of the adenoid [2].

This study aimed to assess the relevance of adenoid facies as a diagnostic benchmark for morbidity in otorhinolaryngology, to clinically correlate adenoid facies with various clinical features related to ENT. We also aimed to correlate radiologically the presence of adenoid facies with mastoid pneumatisation and nasopharyngeal thickness impact and to broadly study the various sequelae of adenoid hypertrophy on the physical, mental as well as the social conditioning of children.

## **Materials and methods**

### **Study design and patient population**

The present study was carried out in the department of Otorhinolaryngology and Head and Neck Surgery Netaji Subhash Chandra Bose Medical College and Hospital, Jabalpur from January 2012 till December 2012. The patients with features of adenoid facies with relevant clinical features pertaining to ear, nose and throat or overall physical, mental and social development of a child were included.

### **Data collection and analysis**

After taking approval of the institutional ethics committee, the patients were consented and enrolled for the study. A thorough history was taken for each patient in the greatest detail so as to cover symptoms pertaining to ear, nose and oral cavity as well as mental, physical and social development of the patient. A detailed general, rhinological, otological and oral examination of the patient was done, along with adenoid examination by way of palpation and posterior rhinoscopic examination will be done. Depending on the history and clinical examination a provisional diagnosis was reached. Equipment used in the study were Bull's eye lamp, head mirror, tongue depressor, nasal speculum, indirect laryngoscopy mirror, posterior rhinoscopy mirror, ear speculum, Siegles speculum, tuning forks, Jobson horn probe, Otoscope, Eustachian tube catheter, pure tone audiometer and endoscopes were used when required. Data obtained from hospitals was codified and entered into Microsoft excel sheets. Data were then analyzed using the Statistical Package for Social Sciences (SPSS) version 21.

## **Results**

The present study was conducted in total 30 patients with adenoid facies of varying degrees. It was observed that nasal block was a presenting symptom in most of the cases (83.33%) followed by nasal discharge. Nasal bleed and frequent headaches accounted for 10% and 13.33% of cases respectively. Most cases were found to be bilateral (96% of symptomatic patients) while 4% of patients showed laterality to left side. None of the cases under study showed laterality to right side. Most of the cases were seen in children between 5-9 years of age (56.66%) while 43.33% cases were seen in children of age >10 years. No cases were seen in <5 years of age. It was observed that patient presented with pain in ear, decreased hearing and blocked ear in maximum number of patients i.e. 40%, 36.66% and 33.33% of patients respectively while discharging ears were seen in 26.66% of cases. Pain in throat on and off was complained of by

66.66% of cases. In 50% of cases the parents complained of irregular dentition. A pinched nostril was found in 73.33% of children with a normal of 26.66%. Septal deviation was maximally seen as being to the left side (70%), while in 30% of cases it was seen to the right. Decreased airflow upon functional examination of the nose was seen to be bilateral in majority of cases (73.33%), in 20% of cases airflow was found to be normal while airflow decreased only on the left side was found in 6.66% of cases.

In majority of the cases, adenoid hypertrophy was found directly visualized in posterior rhinoscopy examination, in one single case it was seen that a nasal polyp was visualized. It was seen that most children with adenoid facies presented with open mouth for breathing (70%). A hitched upper lip was found in 100% of cases. Merely enlarged central upper incisors were seen in 80% of cases, while 40% of cases showed crowded central upper incisors, sometimes with enlargement or sometimes without. High arched palate was seen in all cases (100%), grade III tonsil enlargement was seen in 63.33% cases while grade II tonsil enlargement was seen in 30% cases. 3.33% cases showed an extreme of Grade I or Grade IV tonsil enlargement. Most of cases (71.66 %) had clear ear canals, 16.66% and 13.33% of cases had ear discharge and ear wax respectively. An equal number of cases (33.33%) had an intact or retracted tympanic membrane while 15% cases presented glue ear and 13.33% cases had a central perforation. Cholesteatoma was seen in 5% of cases. When hearing loss was assessed, 65% of ears were found to be having conductive hearing loss, while a further 33.33% had normal hearing, while only 1 ear was found to have sensorineural hearing loss. It was seen that mastoid pneumatization was affected by adenoids, being partial cellular in majority of the cases (48.33%) and sclerosed in 18.33% ears. A normal cellularity was seen in 33.33% of the ears (**Table – 1, 2, 3**).

**Table – 1:** Characteristics of patients involved in the study.

|                                      |    |
|--------------------------------------|----|
| Total patients enrolled in the study | 30 |
| Males                                | 24 |
| <b>Age distribution</b>              |    |
| Less than 5 years of age             | 0  |
| 5-9 years of age                     | 17 |
| More than 10 years of age            | 13 |
| <b>Nasal symptoms</b>                |    |
| Nasal blockage                       | 25 |
| Nasal discharge                      | 19 |
| Nasal bleed                          | 3  |
| Frequent headache                    | 4  |
| <b>Laterality of disease</b>         |    |
| Right side                           | 0  |
| Left side                            | 1  |
| Bilateral                            | 24 |
| <b>Ear symptoms</b>                  |    |
| Blocked ear                          | 20 |
| Decreased hearing                    | 22 |
| Pain in ear                          | 24 |
| Ear discharge                        | 16 |
| <b>Oral symptoms</b>                 |    |
| Frequent sore throat                 | 21 |
| Pain in throat                       | 20 |
| Mouth breathing                      | 27 |
| Irregular teeth                      | 15 |
| <b>Other symptoms</b>                |    |
| General ill health                   | 19 |
| Poor nutrition                       | 13 |
| Dullness                             | 7  |
| Lack of attention                    | 7  |
| Lacking in studies                   | 7  |

## Discussion

The present study is an attempt to analyse patients with the atypical appearance of the face, often referred to as adenoid facies and the actual disease prevalence in such children, the disease morbidity in them as a sequelae of possessing such facial features, due to affection by upper respiratory obstruction symptoms caused by adenoid hypertrophy, be it clinically or radiologically. The present study was conducted at NSCB Medical College and Hospital, Jabalpur

(M.P) in total 30 number of patients with adenoid facies of varying degrees, where some of the patients were seen in our outpatient department while some of them were admitted in ENT ward of the same hospital for surgical interventions. While most cases presented with the expected complaints of nasal obstruction or nasal discharge due to rhinosinusitis, or even those related to tonsils like frequent sore throat or pain in throat, some cases presented with primary complaints related only to ear which later turned out to be recurrent acute otitis media, chronic suppurative otitis media, serous otitis media etc.

Though our study shows a male preponderance of 80% compared to females 20%, in the form of more boys presenting with disease rather than girls, this may be ascribed to more environmental exposure in males leading to more upper respiratory tract infections as well as better medical exposure of the male child, which may actually be telling on the discrimination towards the female child rather than significant as a statistical finding. When age groups were reviewed, most of the cases were seen in children between 5 - 9 years of age. No cases were seen in < 5 years of age, which may be due to a chance factor though cases have been described of adenoid hypertrophy even in infants as well [3]. It was observed that nasal block was a dominant presenting symptom in most of the cases (83.33%). It also leads to mouth breathing, obstructive sleep apnea and snoring. Nasal obstruction also interferes with feeding or suckling of a child. As respiration and feeding cannot take place simultaneously, a child with adenoid enlargement fails to thrive. Nasal bleed i.e. epistaxis is seen when adenoids are acutely inflamed; in some cases epistaxis may occur even with nose blowing. In one recent study, 6 out of 50 patients above age 15 were found to be suffering from enlarged congested adenoids [4].

This study showed most cases to be bilateral in terms of nasal symptoms (96% of symptomatic patients) while 4% of patients showed laterality to left side. None of the cases under study showed laterality to right side. Most cases are

expected to be bilateral as adenoids are classically situated at the junction of roof and posterior wall of nasopharynx, and nasopharynx being the common pathway for both nostrils. Later septal deviation was maximally seen as being to the left side (70%) which could be a contributory factor in a number of cases, but one that is difficult to separate from the original factor under study. We saw that mouth breathing at presentation was not a commonly observed feature by parents, but when probed in detail and the parents were asked to observe the child while sleeping, in 90% of cases it was reported positively. Behlfelt showed that 62.58% of the children with adenoid hypertrophy had mouth breathing during the day and 84.78% during nights, which is only slightly less than the figures observed here, hence one would like to point out the need to deeply probe this aspect, asking the right questions and asking the parents to be vigilant as well as the value to the clinician of following up the patient [5].

Upon nasal examination, more attention was paid to the outward appearance of the nasal dorsum as an important part of adenoid facies. An elongated nasal dorsum was found in around 90% of children that suggests craniofacial dysmorphic trait in the child. Pinched in nostrils were found in about 73.33% of cases which can again be considered a facial landmark for such children. This finding while expected to be bilateral due to the anatomical positioning of the adenoids, though in 20% of cases airflow was found to be normal, perhaps emphasizing the importance of infectious status of adenoids, as well as confounding factors like use of vasoconstrictor nasal drops at the time of examination etc. and one has not even mentioned the wide availability of various antibiotics at every step. High-arched palate is associated with difficulties, including disrupted sleep caused by obstruction of the nasal passages, besides the sleep apnea discussed above, speech problems, and with dental problems, such as crowding of the molars, as discussed above. It also poses challenges for feeding and speech, hence

resulting in poor feeding and undernourished child.

**Table – 2:** Examination findings in the included patients.

| <b>Nasal examination</b>           |    |
|------------------------------------|----|
| <i>Nasal dorsum</i>                |    |
| Elongated                          | 27 |
| Normal                             | 3  |
| <i>Nostril</i>                     |    |
| Pinched in                         | 22 |
| Normal                             | 8  |
| <i>Functional airflow</i>          |    |
| Decreased in right only            | 0  |
| Decreased in left only             | 2  |
| Decreased in both sides            | 22 |
| Normal                             | 6  |
| <i>Post rhinoscopy examination</i> |    |
| Adenoid hypertrophy                | 29 |
| Other                              | 1  |
| Normal                             | 0  |
| <b>Oral cavity examination</b>     |    |
| <i>Outer appearance</i>            |    |
| Open mouth at presentation         | 21 |
| Normal                             | 9  |
| <i>Upper lip</i>                   |    |
| Hitched up                         | 30 |
| Normal                             | 0  |
| <i>Teeth (upper incisor)</i>       |    |
| Enlarged                           | 24 |
| Crowded                            | 12 |
| Normal                             | 0  |
| <i>Hard palate</i>                 |    |
| High arched                        | 30 |
| Normal                             | 0  |
| <i>Tonsil enlargement</i>          |    |
| Grade I                            | 1  |
| Grade II                           | 9  |
| Grade III                          | 19 |
| Grade IV                           | 1  |
| <b>Ear Examination</b>             |    |
| <i>Ear canal</i>                   |    |
| Discharge                          | 10 |
| Wax                                | 8  |
| Clear                              | 43 |

| <i>Tympanic membrane</i> |    |
|--------------------------|----|
| Intact                   | 20 |
| Retracted                | 20 |
| Effusion                 | 9  |
| Perforation              | 8  |
| Cholesteatoma            | 3  |
| <i>Hearing loss</i>      |    |
| Conductive               | 39 |
| Sensory                  | 1  |
| Normal                   | 20 |
| <b>Face Examination</b>  |    |
| Elongated                | 30 |
| Frontal bossing          | 26 |
| Dull expression          | 9  |

**Table – 3:** Radiological examination of the patients.

| <b>Radiological examination (Schuller's view)</b> |    |
|---|----|
| Cellular  | 20 |
| Partial cellular                                  | 29 |
| Sclerosed   | 11 |
| <b>X-ray Nasopharynx soft tissue lateral view</b> |    |
| Adenoid grade I                                   | 3  |
| Adenoid grade II                                  | 7  |
| Adenoid grade III                                 | 17 |
| Adenoid grade IV                                  | 3  |

The adenoids are in the midline of the nasopharynx, situated at the junction of roof and posterior wall of nasopharynx and the Eustachian tubes open to the right and left of them. Very large adenoids will physically block the Eustachian tubes opening which can lead to otitis media. The benefit of adenoidectomy in the management of otitis media with effusion (OME) has traditionally been ascribed to the relief of anatomical obstruction of the Eustachian tube [6]. While this may be a contributory factor, it is clear that adenoid size and physical obstruction alone cannot account for the benefit following adenoidectomy where the adenoid is small. It is likely that recurrent acute or chronic inflammation of the adenoid also play a role. These changes increase bacterial adherence. This is likely to contribute to the development of a 'biofilm' infection resulting in middle ear

effusion [7]. There is now good evidence to support consideration of 'adjuvant' adenoidectomy in children over the age of three who are undergoing insertion of tympanostomy tube. Low dose prophylactic antibiotic treatment is preferred to adenoidectomy in this group as a means of preventing recurrent otitis media and the sequelae of infection until maturation of the immune system occurs naturally [8].

An elongated face was one defining characteristic of this study like hitched up upper lip seen earlier being seen in 100% of cases, it can be explained in the same way as high arched palate, due to unopposed medial forces of the buccinators and masseter muscles leading to the face being rather long drawn. An Elongated nasal dorsum is an accompanying part of an elongated face, as seen earlier, during nasal examination. Forehead bossing was seen in 86.66% cases, being a rather prominent feature, though it is not described at all places as being a part of adenoid facies. Vacant dull expression – has been described being due to the open mouth and hearing loss combining to give the child a dull idiotic look, which need not be elaborated further will be seen only in cases, with larger grades of adenoid hypertrophy, though 65% of ears were found to be having a conductive type of hearing loss, but it was mild in most cases, in this study was noted in 9 cases (30%) out of which all cases of grade 4 adenoids in this study were present and none of the remaining cases had adenoid enlargement less than grade 3.

The role of Eustachian tube in the pneumatisation of the mastoid air cells is an important one. In a child with Eustachian tube compression/ edema due to adenoid infection or hypertrophy, it is the mastoid that is likely to suffer after the affection of the middle ear, though their relation to some extent is still under research, but one must remember the theories of Wittmaack regarding the development of cholesteatoma in order to gain more insight into this relationship who gave a normal middle ear to be a prerequisite for a normal mastoid development [9]. This was later supported by the

studies of Tumarkin who further emphasised that middle ear diseases are the cause of reduced mastoid pneumatisation [10]. The degree to which mastoid pneumatization affected by adenoids was the aim here, with mastoid antrum being partial cellular in majority of the cases (48.33%) and sclerosed in 18.33% ears. A normal cellularity was seen in 33.33% ears. Hence we conclude that majority of the antrums were affected to some extent thus concluding with earlier studies and making a point to go in for X-ray mastoid in all patients of adenoids, especially to look for the life threatening CSOM unsafe type in such patients.

## **Conclusion**

This study was conducted in total 30 patients with adenoid facies of varying degrees. The most common age group affected were children between the age group of 5-9 years, thus signifying the early effect of adenoid hypertrophy in this age. Dullness, lack of attention, lacking behind in studies was seen very commonly. These are indicative of the need for vigilance in children at school level, with school teachers playing an important role as well as the need for regular ENT checkup in all school going children. Thus in summary this study concludes that adenoids affect each part of ear nose and throat system, thus its effect can actually be quite devastating in growing children, hence the need to be on the look out for its facial features in all pediatric ENT patients, which makes for a very quick and easy diagnosis, and a major clinical strong point for all ENT practitioners.

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