

# Adenoid Hypertrophy and Oral Breathing: A Case Report

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## Abstract

**Background:** Adenoids are lymphoid tissues located on the posterior wall of the nasopharynx and form part of Waldeyer's ring. Adenoid Hypertrophy (AH) is a common condition in children, often resulting from recurrent infections and chronic antigenic stimulation. It can lead to nasal airway obstruction, resulting in mouth breathing, snoring, sleep-disordered breathing and even craniofacial changes if left untreated. The prevalence of AH in children varies between 34.5% and 70%, depending on diagnostic criteria and population studied.

**Case Presentation:** An 11-year-old boy reported to the ENT outpatient department with complaints of persistent snoring for one year, associated with mouth breathing and nasal obstruction. On clinical examination, the patient exhibited features of adenoid facies, including dull, expressionless appearance, open-mouth posture, sunken eyes, crowding and protrusion of anterior teeth, loss of nasolabial folds and a high-arched palate. Nasopharyngoscopic examination revealed Grade 3 adenoid hypertrophy. Lateral soft-tissue neck radiograph confirmed adenoid enlargement causing nasopharyngeal airway narrowing. The patient underwent endoscopy-assisted adenoidectomy with bilateral tonsillectomy under general anesthesia. Postoperatively, fluid was suctioned from the middle ear and the recovery was uneventful. On follow-up after three months, the patient demonstrated complete resolution of mouth breathing and snoring.

**Conclusion:** This case highlights the significance of early diagnosis and management of adenoid hypertrophy in children presenting with mouth breathing. Timely endoscopic adenoidectomy and tonsillectomy can effectively alleviate upper airway obstruction, improve quality of life and prevent long-term craniofacial and dental complications associated with chronic oral breathing.

**Keywords:** Adenoid Hypertrophy; Mouth Breathing; Nasopharyngeal Obstruction; Adenoidectomy; Craniofacial Changes

## Introduction

Adenoids, a prominent mass of lymphoid tissue located on the posterior wall of the nasopharynx, form part of Waldeyer's ring along with the palatine tonsils [1]. They normally enlarge after birth in response to antigenic exposure and increased immune activity during early childhood, reaching their peak size around five years of age before regressing at puberty. Similarly, the palatine tonsils grow until approximately four years of age due to recurrent infections and subsequently begin to regress [2]. According to Pereira, et al., the prevalence of Adenoid Hypertrophy (AH) in pediatric population was 34.5%, while studies using convenience samples reported higher rates ranging from 42% to 70% [3].

A prominent cause of Adenoid Hypertrophy (AH) in children is bacterial infections, which can constrict or restrict the nasal airways. Whether breathing through the nose or the mouth depends on the size of the nasopharyngeal airway [4]. AH has been linked to a number of local and systemic symptoms, such as obstructive sleep apnea, Mouth Breathing (MB), snoring and nasal

blockage, according to numerous research [5,6]. The reported prevalence of mouth breathing varies greatly, from 4.3% to 56.8%. This variation is probably caused by variations in age groups, geographic locations and the diagnostic techniques employed to evaluate breathing patterns [7,8].

Lateral cephalometric radiographs are used to evaluate the relationship between the adenoids, the nasopharyngeal airway and nasal resistance due to adenoid hypertrophy [9]. One of the clearest signs for tonsillectomy and adenoidectomy is a sleep-related breathing difficulties with apnea [10]. When palatine tonsils and adenoid tissue overgrow and result in Upper Airway Obstruction (UAO), adenoidectomy and tonsillectomy are performed to eliminate upper airway resistance [11,12]. Although they can be done at various periods, tonsillectomy and adenoidectomy are typically done in the same procedure. Depending on the patient's clinical findings, this choice could change [13]. Serious disorders such craniofacial abnormalities, pulmonary hypertension, cor pulmonale and in very rare instances, acute UAO, can result from ATH if left untreated [10]. The aim of this report was to contribute to the literature by presenting and discussing a 11-year-old male patient with Adenoid Hypertrophy (AH) presenting with snoring and mouth breathing that led to UAO requiring endoscopy assisted adenoidectomy with bilateral tonsillectomy.

### Case Presentation

A 11 year old boy presented to ENT OPD with complaints of snoring during sleep over past 1 year. It was found to be associated with mouth breathing and nasal obstruction. On examination, patients had typical adenoid facies including dull mask-like mass, sunken eyes, protruding teeth, overcrowding of teeth, loss of nasolabial folds. Intra-oral examination revealed a narrow and constricted maxillary arch associated with a high palatal vault. The maxillary anterior segment exhibited mild to moderate crowding with labial proclination of the incisors (Fig. 1). Lateral occlusal assessment showed an increased overjet, suggestive of a Class II incisor relationship, with the maxillary incisors positioned anterior to the mandibular incisors. The mandibular anterior region demonstrated mild crowding. The anterior overbite was reduced, with incomplete vertical overlapping of the incisors. The posterior teeth were relatively well aligned; however, the overall maxillary arch form appeared compromised. The gingival tissues were clinically healthy, with no evident signs of inflammation or gingival recession in the examined areas (Fig. 2-4). A lateral soft-tissue neck radiograph revealed the presence of adenoid hypertrophy, leading to a provisional diagnosis of adenoid hypertrophy (Fig. 5,6). This finding was further confirmed on nasopharyngoscopy, which demonstrated Grade III adenoid hypertrophy (Fig. 7). The patient subsequently underwent endoscopy-assisted adenoidectomy with bilateral tonsillectomy under general anesthesia. Intraoperatively, fluid was suctioned from the middle ear (Fig. 8). At the 3-month follow-up, the patient showed significant clinical improvement with no reported postoperative complications (Fig. 9).



**Figure 1:** Maxillary arch.



**Figure 2:** Frontal view.



**Figure 3:** Right lateral.



**Figure 4:** Left lateral.



**Figure 5:** Lateral cephalometric radiograph.



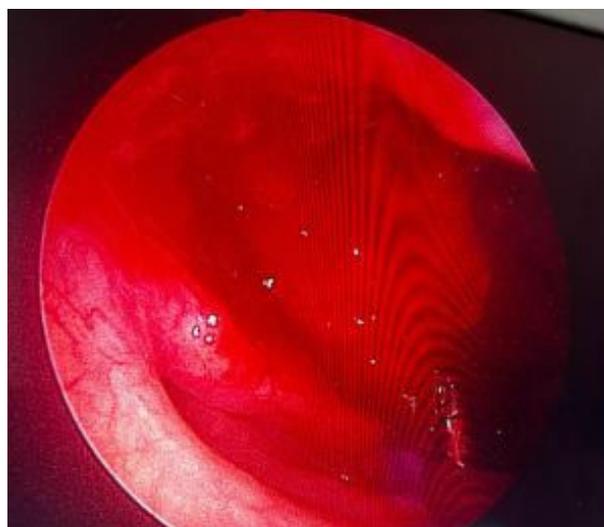
**Figure 6:** Orthopantomogram- OPG- showing mixed dentition with developing permanent teeth.



**Figure 7:** Endoscopic view of the nasopharynx during endoscopy-assisted adenoidectomy with bilateral tonsillectomy.



**Figure 8:** Excised adenoid tissue specimens.



**Figure 9:** Endoscopic view of the nasopharynx after excision of adenoid hypertrophy.

## Discussion

In children, Adenoid Hypertrophy (AH) is a common cause of Upper Airway Obstruction (UAO), frequently leading to sleep-disordered breathing, snoring, nasal blockage and habitual mouth breathing [13]. The adenoids, which form part of Waldeyer's ring, play a protective role by guarding the nasopharyngeal airway against inhaled pathogens; however, repeated antigenic stimulation during early childhood can result in lymphoid hyperplasia and progressive airway compromise [14]. The severity of adenoid hypertrophy is commonly graded based on the extent of nasopharyngeal airway obstruction as follows: Grade I-adenoids occupy <25% of the choanal space with minimal or no symptoms; Grade II-25–50% obstruction, often associated with intermittent nasal blockage and mild snoring; Grade III-50–75% obstruction, producing persistent nasal obstruction, mouth breathing and sleep-related breathing disturbances; and Grade IV->75% obstruction with near-complete choanal blockage, commonly associated with severe snoring, obstructive sleep apnea, hyponasal speech and recurrent otitis media. This grading system is clinically significant, as increasing adenoid size correlates with the severity of airway obstruction and guides treatment decisions ranging from conservative management to adenoidectomy.

The Waldeyer's ring's adenoids protect the nasopharyngeal airway from inhaled infections, but frequent antigenic stimulation can cause lymphoid hyperplasia and blockage [14]. In the present case, an 11-year-old boy with the symptoms of Adenoid hypertrophy-snoring, restless sleep and continuous mouth breathing-developed clinical signs of UAO and eventually needed endoscopy-assisted adenoidectomy with bilateral tonsillectomy. Adenoid hypertrophy-induced chronic mouth breathing causes a series of postural and dentofacial changes. It has been shown in the literature that mouth breathing causes abnormal maxillofacial growth by changing normal orofacial muscle balance, tongue posture and mandibular location [15-17]. A long and narrow face, a high-arched palate, a constricted maxillary arch, an enlarged overjet, an anterior open bite and incompetent lips were some of the characteristics displayed by the patient in this report. These results are consistent with the common "adenoid facies" reported in the literature [18]. The equilibrium between intra- and extra-oral muscle forces is impacted by continuous oral respiration. A V-shaped arch form results from the buccinator muscles constricting the maxillary arch due to insufficient pressure from the low tongue posture [19]. The mandible also has a tendency to twist backward and downward at the same time, which raises the lower face height and adds to the alternation in dentofacial skeletal pattern [20]. A vicious cycle between airway obstruction and craniofacial morphology may be created by this changed growth pattern, which could worsen airway compromise [11].

Children with AH frequently have dental malocclusions. Research shows that chronic mouth breathers are more likely to exhibit Class II skeletal patterns, posterior crossbites and open bites than nasal breathers [12,13]. Zicari, et al., observed that oral breathers had a greater overjet and reduced overbite [14]. While Harari, et al., showed that continuous mouth breathing after the age of six can result in irreversible alterations in maxillofacial growth [15]. These long-term repercussions of the altered breathing mode were evident in our case in the form of an anterior open bite, increased overjet and a narrow maxillary arch. Mouth breathing may also affect the state of oral health from the standpoint of dental development. Susceptibility to dental caries and gingival inflammation is increased by reduced salivary flow and altered oral pH brought on by constant airflow over the oral cavity [16]. The dryness of oral mucosa, combined with inadequate lip seal, favors plaque accumulation and anterior gingivitis. Furthermore, improper tongue posture might impact oral function and appearance by interfering with appropriate swallowing and phonation patterns [17].

Intermittent hypoxia and sleep-disordered breathing can cause behavioral abnormalities, poor concentration and delayed growth in children with AH [20]. Therefore, early identification and treatment are essential for normal craniofacial and dental development as well as airway management. In situations of severe blockage or recurring infections, surgical intervention is still the gold standard, even if pharmacologic therapy with leukotriene receptor antagonists or intranasal corticosteroids can improve minor symptoms [29]. In this instance, bilateral tonsillectomy and endoscopy-assisted adenoidectomy were carried out. By avoiding surgical stress, decreasing recurrence and enabling the entire removal of hypertrophic tissue under direct vision, endoscopic procedures have demonstrated superior results [20]. In these situations, postoperative results are usually positive, showing notable improvements in sleep quality, nasal breathing and the possibility for craniofacial growth [11]. Normalization of nasal breathing after airway correction may enable partial recovery of muscle balance and tongue position, which, if done during the active growth phase, can positively impact dental arch development [12]. Therefore, to accomplish both functional and aesthetic rehabilitation, prompt orthodontic and surgical coordination is crucial. This instance emphasizes the value of a multidisciplinary approach that includes pediatric dentists, orthodontists, otorhinolaryngologists and pediatricians. Using facial

and oral cues, pediatric dentists in particular can be quite helpful in the early detection of mouth breathing. Irreversible craniofacial changes may be avoided with early detection and referral for airway examination, improving the child's general health and quality of life.

### **Conclusion**

The significance of early detection, precise diagnosis and timely treatment of adenoid hypertrophy in young patients exhibiting prolonged mouth breathing is highlighted in this case. If adenoid hypertrophy is not addressed, it may result in persistent obstruction of the upper airway, which can cause a number of problems, including abnormal craniofacial development, sleep disorders and recurring infections. A minimally invasive and very successful method of reestablishing normal nasal airflow is early intervention with endoscopic adenoidectomy, which is frequently paired with tonsillectomy. This improves the child's sleep habits, nasal breathing and attentiveness during the day in addition to easing the symptoms of upper airway obstruction. Additionally, prompt surgical treatment can avoid long-term dentofacial effects that are frequently linked to prolonged oral breathing, including postural changes of the head and neck, high-arched palate, dental malocclusion and increased lower facial height. Therefore, a thorough evaluation and prompt intervention for the best functional and developmental results, a multidisciplinary cooperation between pediatricians, otolaryngologists and pediatric dentists is crucial.

### **Conflict of Interest**

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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### **Data Availability Statement**

Not applicable.

### **Ethical Statement**

Ethical approval was not required for this case report as it involved the description of a single patient. Written informed consent was obtained from the patient's parent/guardian for the publication of clinical details and associated images.

### **Informed Consent Statement**

Informed consent was obtained from the participant involved in this study.

### **Consent for Publication**

Informed consent for publication was obtained from the patient involved in this case report, as documented in the manuscript.

### **Authors' Contributions**

All authors have contributed equally to this work and have reviewed and approved the final manuscript for publication.

### **References**

1. Brodsky L. Modern assessment of tonsils and adenoids. *Pediatr Clin North Am.* 1989;36:1551-69.
2. Feng X, Li G, Qu Z, Liu L, Näsström K, Shi XQ. Comparative analysis of upper airway volume with lateral cephalograms and cone-beam computed tomography. *Am J Orthod Dentofacial Orthop.* 2015;147:197-204.
3. Pereira L, Monyror J, Almeida FT. Prevalence of adenoid hypertrophy: A systematic review and meta-analysis. *Sleep Med Rev.* 2018;38:101-12.

4. Goeringer GC, Vidić B. The embryogenesis and anatomy of Waldeyer's ring. *Otolaryngol Clin North Am.* 1987;20(2):207-17.
5. Sun YL, Zheng HT, Tao JL. Effectiveness and safety of Chinese herbal medicine for pediatric adenoid hypertrophy: A meta-analysis. *Int J Pediatr Otorhinolaryngol.* 2019;119:79-85.
6. Liu JL, Li SH, Cai YM. Automated radiographic evaluation of adenoid hypertrophy based on VGG-Lite. *J Dent Res.* 2021;100:1337-43.
7. Savian CM, Bolsson GB, Botton G. Do breastfed children have a lower chance of developing mouth breathing? A systematic review and meta-analysis. *Clin Oral Investig.* 2021;25:1641-54.
8. Yamaguchi H, Tada S, Nakanishi Y. Association between mouth breathing and atopic dermatitis in Japanese children 2-6 years old: A population-based cross-sectional study. *PLoS One.* 2015;10:e0125916.
9. Grewal N, Godhane AV. Lateral cephalometry: A simple and economical clinical guide for assessment of nasopharyngeal free airway space in mouth breathers. *Contemp Clin Dent.* 2010;1(2):66-9.
10. Liang C, Ruiz AG, Jensen EL, Friedman NR. Indications, clinical course and postoperative outcomes of urgent adenotonsillectomy in children. *JAMA Otolaryngol Head Neck Surg.* 2015;141:236-44.
11. Bhat VK, Shetty D, Nagaiah PH. Effects of adenoidectomy and adenotonsillectomy on the components of Waldeyer ring. *Int J Otorhinolaryngol Head Neck Surg.* 2017;3:290-7.
12. Berlucchi M, Salsi D, Valetti L, Parrinello G, Nicolai P. The role of mometasone furoate aqueous nasal spray in the treatment of adenoidal hypertrophy in the pediatric age group: preliminary results of a prospective, randomized study. *Pediatrics.* 2007;119:e1392-7.
13. Fujioka M, Young LW, Girdany BR. Radiographic evaluation of adenoidal size in children: Adenoidal-nasopharyngeal ratio. *AJR Am J Roentgenol.* 1979;133(3):401-4.
14. Di Francesco RC. Adenoid hypertrophy: Relationships with age, allergic rhinitis and nasal septum deviation. *Int J Pediatr Otorhinolaryngol.* 2008;72(6):767-73.
15. Peltomäki T. The effect of mode of breathing on craniofacial growth revisited. *Eur J Orthod.* 2007;29(5):426-9.
16. Souki BQ. Mouth breathing, nose breathing and facial morphology in children. *Angle Orthod.* 2009;79(1):54-8.
17. Harari D. The effect of mouth breathing versus nasal breathing on dentofacial and craniofacial development in orthodontic patients. *Laryngoscope.* 2010;120(10):2089-93.
18. Abreu RR. Etiology, clinical manifestations and concurrent findings in mouth-breathing children. *J Pediatr (Rio J).* 2008;84(6):529-35.
19. Moss ML, Salentijn L. The primary role of functional matrices in facial growth. *Am J Orthod.* 1969;55(6):566-77.
20. Lione R. Effects of adenotonsillectomy on facial growth in children with obstructive sleep apnea syndrome: A systematic review. *Eur J Orthod.* 2015;37(5):569-76.

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