

Richard B. Evans, D.D.S.

General Dentistry ♦ Craniofacial Pain ♦ TMJ & Sleep Disorders ♦ Orthodontics

The Influence of Airway on Facial Bone Development

Did you know that the way your child breathes can affect the development of his or her jaws and facial structure influencing how teeth fit together? Normal breathing should occur through the nose with the mouth closed. However, if the nasal passage is somehow obstructed, mouth breathing often results. Generally, nasal airway obstruction is caused by one or more of the following: (see Figure 1 A & B).

1. Enlarged Tonsils
2. Nasal blockage due to swollen tissue, allergies or polyps.
3. Underdeveloped nasal passages and/or underdeveloped jaw and cheekbones.
4. Deviated nasal septum
5. Enlarged nasal turbinates

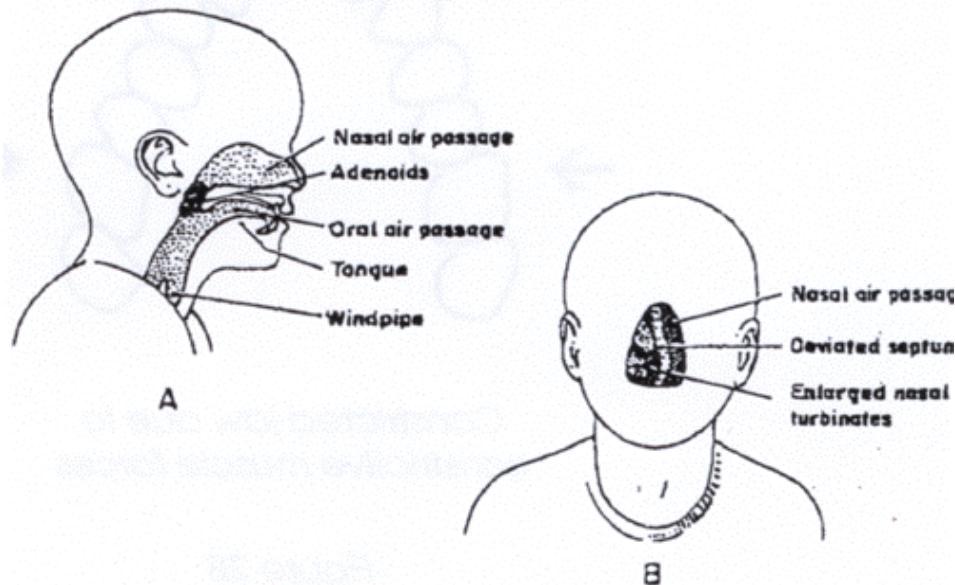
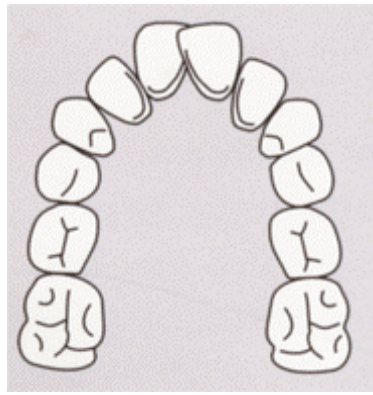


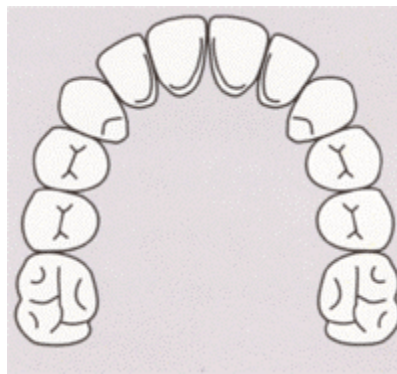
Figure 1

All of the above cause the child to breathe with his or her mouth open. This open mouth posture causes the facial muscles to generate unnatural constrictive forces on the underlying bony structures. Narrowing and elongation of the upper jaw often is the result of such forces (see Figure 2B). In addition, the jaws tend to grow apart, often causing front open bites which affect the position of the tongue and other facial structures.



Constricted jaw due to constrictive muscle forces

Figure 2B



Also, because the lower jaw is dropped for mouth breathing, it tends not only to grow apart from the upper jaw, but also becomes positioned further back than normal, causing an over-bite (see Figure 2C)

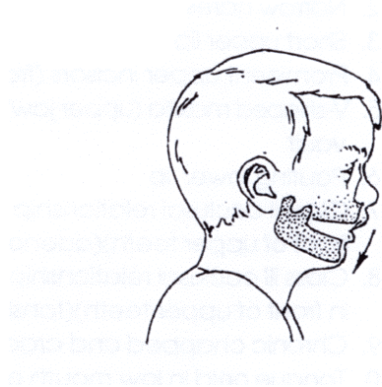


Figure 2C

How the tongue rests in the mouth can also negatively affect facial growth. The tongue at rest should be high in the mouth which stimulates normal growth of the maxilla (upper jaw). Enlarged tonsils force the tongue in a downward and forward position which pushes on the lower jaw and the lower teeth (tongue thrust). This in turn can contribute to prognathism (protruding of the lower jaw) by over stimulating jaw growth (see Figure 3).

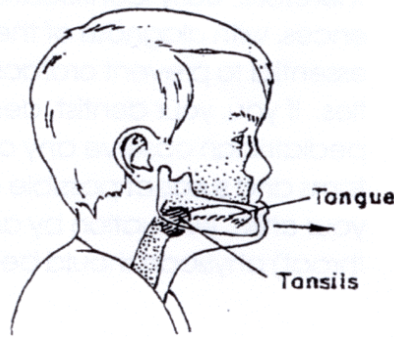


Figure 3

Facial asymmetries and some TMJ dysfunctions (jaw joint problems) can also be attributed to orofacial muscle imbalances and deviate tongue postures due to airway interferences. The following is a list of symptoms associated with airway obstruction:

1. Open mouth position (with possible open-bite)
2. Narrow nares
3. Short upper lip
4. Prominent upper incisors (front teeth)
5. V-shaped maxilla (upper jaw), high palatal vault
6. Pouting lower lip
7. Class II occlusal relationship (lower teeth in front of upper teeth)(adenoid problem)
8. Class III occlusal relationship (Lower teeth in front of upper teeth)(tonsillar problem)
9. Chronic chapped and cracked lips
10. Tongue held in low mouth position
11. Crease on nose (allergic salute)
12. Aggravated allergies
13. Gummy smile and red swollen gum tissues
14. Allergic shiners (constant dark circles under the eyes)
15. Excessive snoring at night

Eighty-five percent of orofacial growth is accomplished by the age of twelve. Therefore, early identification of airway interferences, with diagnosis of the underlying cause, is essential to prevent orofacial growth abnormalities. If you, your dentist, dental hygienist or pediatrician observe any of the above symptoms and suspect possible airway obstruction in your child, evaluation by an ENT (ears, nose and throat) physician should be undertaken.

Please keep in mind that there are many other factors beside airway considerations that affect dental-facial development (i.e. genetics, muscular tone, tooth and jaw sizes, allergies, etc.) Therefore addressing just these airway interferences will not always guarantee correction of dento-facial problems. However, if airway interferences are eliminated before facial growth is completed, a suitable environment will be established to promote a more normal development of the orofacial structures. This can eliminate or simplify the need for extensive orthodontic treatment. Also in cases where airway interferences have been eliminated, relapse of orthodontic treatment is greatly reduced. The results include not only a more stable dentition and bite, but also a more pleasing facial appearance for your child.

The following professional references have been provided for your pediatrician/physician if they would like to know more about the effects of airway obstruction upon facial growth.

McNamara, J.A. (ed): Naso-Respiratory Function and Craniofacial Growth, Center for Human Growth and Development, Ann Arbor, MI 1979.

Linder-Aronson, Woodside & Lundstrom: Mandibular Growth Direction Following Adenoidectomy, American Journal of Orthodontics and Dentofacial Orthopedics; April 1986.

Shapiro, G. (M.D.), Shapiro, P. (D.D.S., M.S.D.) The Effects of Nasal Obstruction on Facial Development and Orthodontic Treatment. Office of Continuing Education, Baylor College 1987.

Meredith, George M., The Airway and Dentofacial Development; Ear Nose Throat J. 1987, 66:196-200.

Weimert, Thomas A., Evaluation of the Upper Airway in Children; Ear Nose Throat J. 1987, 66: 196-200.

Richter, Harry J., Obstruction of the Pediatric Upper Airway; Ear Nose Throat J. 1987, 66: 209-211.

Petit, Henri, Upper Airway Problems and Pre-Orthodontic Orthopedics; Ear Nose Throat J. 1987, 66: 248-51.

Gray, Lindsay P., Rapid maxillary Expansion and Impaired Nasal Respiration; Ear Nose Throat J. 1987, 66: 248-51.

Timms, Donald J., Rapid Maxillary Expansion in the Treatment of Nasal Obstruction and Respiratory Disease; Ears Nose Throat J. 1987, 66: 248-51.

Brochure by Dr. Derek Mahony, copied with permission.