Mouth Breathing Part II: HOW TO FIX THE MOUTH BREATHING FACE

A multi-disciplinary treatise on how to manage your mouth breathing patient

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According to the ENT profession, there are established links between upper airway patency and craniofacial development, and it is now great to see the Australian Society of Orthodontists finally jumping onboard.[1]

As evidence from multiple health sciences converge on the idea that mouth breathing can lead to poor craniofacial growth, the discussion must now turn towards an implementable, systemised treatment approach.

Thus, a multidisciplinary approach involving Dentists, Orthodontists, ENT specialists and Paediatricians is essential in the management of these children.

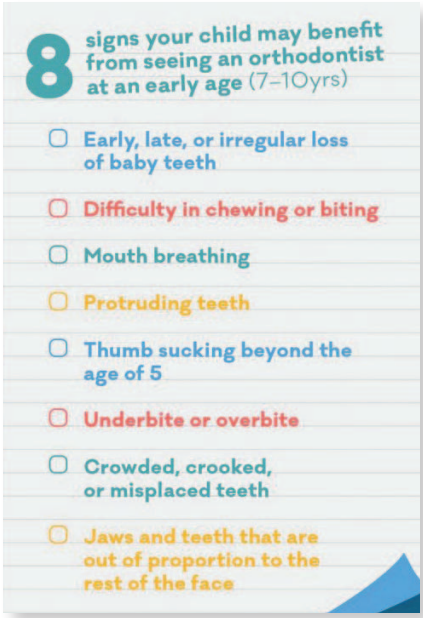

Figure 1: The Australian Society of Orthodontists now recognises mouth breathing has an association with malocclusion.

Effects of mouth breathing on craniofacial and dentofacial development

In normal children, 60% of facial growth is attained by six years and around 90% by 11-12 years of age. The chronic nasal obstruction leads to mouth breathing which in turn has an effect on the maxilla-mandibular skeleton; including halting growth, displacement of the mandible, increased mouth breathing and narrowing of the cranial skeleton.[3] This sequence of events is thought to be promoted by extensive eruption of the posterior molars with mouth breathing which exert a downward vector of force on the mandible causing the lower jaw to rotate down and back in a clockwise direction. With the backward mandible rotation, retrognathia and open bite deformities are common.

The tongue position is lowered so the lateral expansive forces of the tongue on the palate are lost and the unopposed medial forces of the buccinators and masseter muscles leads to a narrow and high arched palate. The lateral expansion of the maxilla often leads to a unilateral or posterior cross bite.

Numerous studies have demonstrated statistically significant disharmony in the growth and development of dentofacial structures including specific findings with mouth breathers showing a significant backward and downward rotation of the mandible, increased overjet, increase in the mandible plane angle, higher palatal arch, narrowing of the upper and lower arches at canine and first molar compared to nasal breathers. Posterior cross bite and abnormal lip to tongue anterior oral seal were also significantly more common in mouth breathers.[4] In the largest study of its kind in history, an ENT journal in 2016 found a close relationship between oral habits, mouth breathing and malocclusion in a sample size of over 3000 children.[5]

A study published recently in the American Journal of Orthodontics and Dentofacial Orthopedics (AJODO) examined the relationship between nasal resistance, adenoids, tonsils, tongue posture and craniofacial development in Class II and Class III patients.[6]

The study showed that various types of airway obstruction, whether nasal or pharyngeal, result in different types of malocclusion due to its effect on tongue posture.

Does treating airway obstruction improve malocclusion?

Studies supporting this have centred on nasal obstruction. A five-year study on children who underwent adenoidectomy for nasal obstruction showed improvements in upper and lower incisor inclination, upper arch width, sagittal depth of the nasopharynx and anterior facial height compared with a matched group of controls. It was noted most of the improvements post-operatively occurred in the first year but remained stable for up to five years postoperatively.[7]

Another often-quoted paper involves Harvold's studies on a group of unfortunate primates. He blocked their noses with latex plugs to induce mouth breathing, and detailed a sudden change from a horizontal to a less-attractive, vertical facial growth pattern.[8]

Importantly, he noted it was a change in the behaviour of the orofacial muscles,

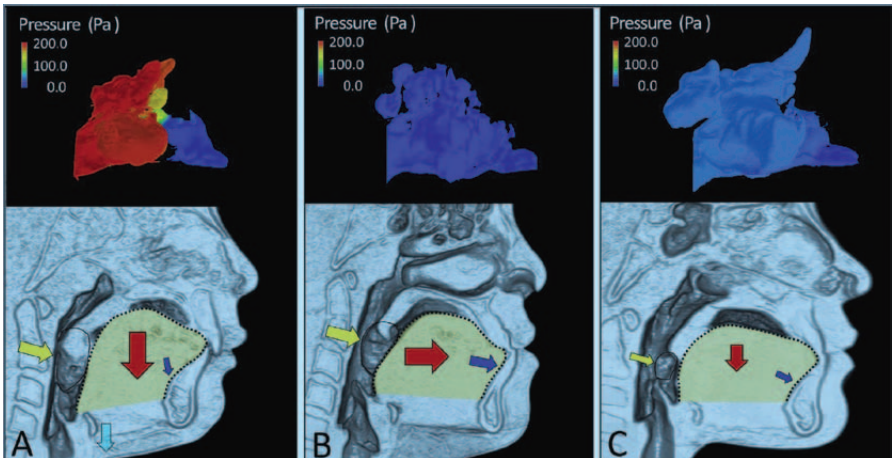

Figure 2: CBCT demonstration of the relationship between airway, tongue posture and malocclusion (Iwasaki et al, AJODO 2017) A: Class II subject had nasal obstruction (upper figure), enlarged tonsils (yellow arrow), low tongue posture (red arrow) and low hyoid bone (light blue arrow). B: Class III subject had no nasal obstruction, but tongue was lowered and postured forwards due to enlarged tonsils (yellow arrow). C: Class III subject had no nasal obstruction and small tonsils, but still inferior and forwards tongue resting posture has led to the malocclusion.

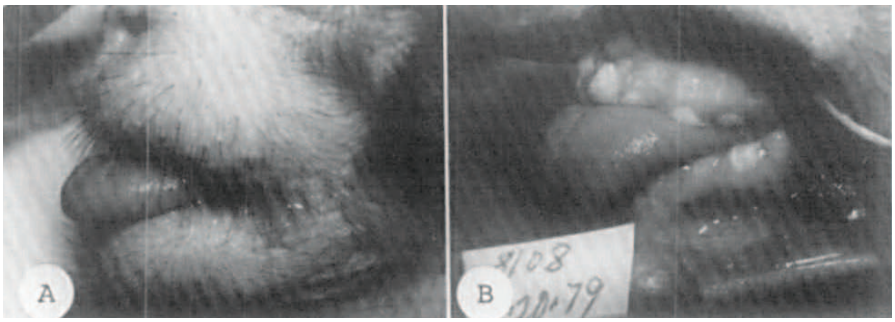

Figure 3: Some primates as part of Harvold's experiments lowered the mandible and protruded the tongue after their noses were blocked. This resulted in a severe open bite. [Image from Harvold EP et. Al. (1981) Primate experiments on oral respiration, *American Journal of Orthodontic*s 79 (4)]

References

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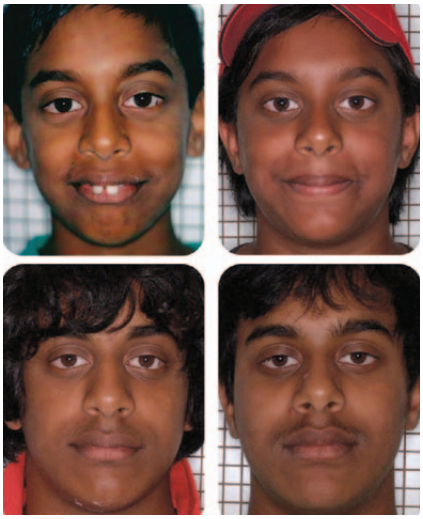

Figure 4: Identical twins look nothing alike before treatment (top); once breathing and muscular influences have been treated (bottom), the patients are allowed to express their full genetic potential.

which he described as "deviant muscle recruitment", that led to the change in facial development. [Figure 3]

A large systematic review and meta-analysis published this year in the European Journal of Orthodontics concluded that treatment of enlarged adenoids and/or tonsils affects dentofacial deformity.[9]

However, it seems further treatment is required in many cases to help restore proper muscular posture and function.

These identical twins [Figure 4] are an example of how mouth breathing and the resultant poor tongue posture can have the determining impact on development of the craniofacial skeleton; they have the same genetic make-up, but completely divergent growth patterns, due to the environmental causes.

The child on the left-hand side was treated with The Myobrace® System, together with a short course of braces, by Dr Chris Farrell (CEO and Founder of Myofunctional Research Co.), and the resultant facial development is striking – it seems as if the genetic potential of the child has been allowed to express, after the breathing and muscular impediments were removed.

The literature on the relationship between mouth breathing and craniofacial development has reached such a critical mass that it is impossible to ignore.

It is now almost tantamount to negligence if airway is not screened in all our orthodontic cases. If required, an ENT specialist should clear an obstruction, however, taking a scalpel to a patient has never been viewed as treating the cause. The breathing and muscular dysfunctions must be treated with myofunctional appliances and exercises, and this at times must also be combined with expansion appliances and braces.

Since the initial causes of malocclusion are not orthodontic problems, it stands to reason that a multi-disciplinary approach is required. Gone are the days that we can pretend the craniofacial complex exists in a vacuum, devoid of breathing and muscular influences. These realisations have given birth to a new evolution in the dental practitioner: The Dental Physician. ◆