



## Orofacial Myofunctional Disorders and Otolaryngologists

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### Abstract

**Objective:** The purpose of this editorial is to alert otolaryngologists to Orofacial Myofunctional Disorders (OMDs) and their primary causes of airway interferences and allergies. An understanding of the variety of OMDs should facilitate improved communications between otolaryngologists and orofacial myologists.

**Method:** OMDs are identified, and the dental alignment and other consequences of OMDs are detailed. Otolaryngologists are a primary resource for evaluating and treating airway interferences in patients with OMDs. Orofacial myofunctional therapy will not be successful without the resolution of airway issues.

**Results:** Tongue thrusting and oral rest posture differences and interactions are discussed. The importance of the dental freeway space in contributing to dental misalignments is detailed.

**Conclusions:** Following referrals from orofacial myologists, otolaryngologists can play an important role in identifying and treating airway interferences that serve to characterize most patients with orofacial myofunctional disorders (OMDs). Knowledge of the characteristics of patients with OMDs regarding rest posture of the jaws and teeth, and abnormal functional activities of the tongue, should facilitate improvements in interdisciplinary communications between otolaryngologists and orofacial myologists.

**Keywords:** Tongue Thrust; Orofacial Myofunctional Disorders; Orofacial Myology; Airway Interference; Mouth Breathing; Nasal Respiration; Allergies; Mandible Posture; Tongue Posture; Freeway Space; Differential Dental Eruption; Crossbite; Open Bite.

### Text of Editorial

The field of orofacial myology is a specialty area within **speech-language pathology and dental hygiene** that treats Orofacial Myofunctional Disorders (OMDs). Tongue thrusting is the most recognizable, over-emphasized and misunderstood of the many OMDs. Since the primary causes of OMDs are unresolved airway issues and allergies, patients with OMDs suspected of having airway interferences or allergies are referred to otolaryngologists to identify and treat airway interferences prior to the initiation of myofunctional therapy.

The purpose of this editorial is to alert otolaryngologists to the variety of orofacial myofunctional disorders (OMDs), their associated airway interferences, allergies, and selected malocclusions can develop.

An understanding of the variety of OMDs should facilitate improved communications between otolaryngologists and orofacial myologists who refer OMD patients for definitive evaluation and treatment.

What are Orofacial Myofunctional disorders (OMDs)? Orofacial myofunctional disorders include one or a combination of the following: (1) abnormal thumb, finger, lip, and tongue sucking habits; (2) an inappropriate mouth-open lips-open resting posture (lip

incompetence); (3) a forward interdental rest posture of the tongue; (4) a forward rest position of the tongue against the maxillary incisors; (5) a lateral, posterior interdental tongue rest posture; and (6) inappropriate thrusting of the tongue in speaking and/or swallowing (tongue thrusting) [1].

The common denominator of OMDs is a vertical increase in the rest position of the jaws, with the mandible hinged open beyond the normal rest position. The rest position of the jaws, with teeth slightly parted, is termed the dental freeway space or the resting inter-occlusal space. A normal freeway dimension is 2-3 mm at the first molar teeth, and 2-5 mm at the incisors [1,2].

An important distinction between the procedures and focus of dentistry and orofacial myology should be recognized: While dentistry focuses on dental occlusion, or teeth-together relationships, myofunctional clinicians focus on teeth-apart behaviors and postures that can lead to, or have already resulted in, malocclusion. This differentiates the muscle retraining therapy of the orofacial myologist from the dental-occlusal procedures of dental/orthodontic providers. A primary goal of orofacial myofunctional therapy is to create or restore an appropriate vertical resting position of the oral structures so that normal processes of dental development can occur [1].

There is a pressing need to recognize the importance of the dental freeway space in initial examination of patients with OMDs, in formulating the goals of treatment, and in evaluating the results and stability of the treatments provided.

## The Consequences of OMDs

The consequence of a freeway space open beyond the normal range for 6 or more hours per day due to airway interferences or allergies can result in changes to the dentition that can take three basic forms: (1) when the tongue assumes a forward, interdental rest posture with mandible hinged open, posterior teeth can over-erupt while anterior teeth are inhibited from further eruption because of the interposed tongue. This process is known as “differential dental eruption” [3,4], the result of which is an anterior open bite. (2) The second scenario of additional, unwanted dental eruption with the mandible hinged open, occurs when the tongue at rest is splayed over the occlusal surface of all mandibular teeth. In this scenario, upper teeth can continue to erupt downward and forward, following their normal curvilinear path of eruption while the lower teeth do not undergo any further vertical eruption. The result is the development of a Class II malocclusion with maxillary incisor protrusion [4]. (3) In this scenario, the mandible is habitually hinged open and the blade of the tongue follows the mandible and is repositioned inferiorly. When this occurs, the tongue loses the normal balancing and opposing pressure relationship with the cheek muscles in maintaining the position of the maxillary posterior dental arches. The buccinator complex of cheek muscles become more activate when the tongue is repositioned inferiorly with the mandible. Over time, the maxillary posterior dental arch narrows to create a posterior maxillary crossbite. The hard palatal vault may also appear to be heightened as the maxillary lateral dental arches are displaced downward along with the narrowing of the maxillary posterior arch segments [3,4].

When unwanted additional dental eruption occurs as in scenarios (1) and (2), the roots of teeth are not further exposed during the over-eruption process because the supporting alveolar bone follows along. This process is termed “vertical drift” of alveolar bone [4].

With the mandible habitually hinged open, changes in facial and oral structures can develop that may include, variably, a high and narrow hard palatal vault, posterior dental crossbite, a recessed chin, mandibular retrognathia, a short upper lip, lip incompetence, and hyperactive/strained mentalis muscle activity.

Conversely, some patients have a habit pattern of clenching that involves keeping the bite closed for hours per day. Closure of the normal freeway space for extended periods can lead to dental trauma and dysfunction of the temporomandibular joint apparatus [2]. Altogether, a change in the normal resting dental freeway space, either too far open or closed, can create negative consequences in dental eruption or the position of teeth.

While an open resting posture of the mandible with a forward resting tongue posture is the primary link with the development of selected dental malocclusions, the functional activity of tongue thrusting continues to be blamed by some clinicians inappropriately for the dental changes often seen [4]. The reasons for this are logical: tongue thrusting during speaking or swallowing is easily observed, while an accompanying abnormal open rest posture of the mandible is easy to miss in evaluations. Consequently, tongue thrusting continues to be incorrectly linked with any dental alignment changes observed. The false claim of dental changes resulting from tongue thrusting will likely continue until the proper roles of resting abnormal postures of the mandible and tongue in creating malocclusions are understood, accepted and appreciated [4].

## Tongue Thrusting

The term “tongue thrusting” is a misnomer, since the term implies incorrectly that the tongue is forcefully thrust forward [3]. A tongue thrusting behavior pattern does not move teeth because the duration of pressure applied by the tongue against teeth is insufficient to move them. Dental changes require a long period (6 hours or more) of light force applied at the dentition to affect dental changes [3]. Although a “tongue thruster” may exhibit this behavior during 1000 or more swallows per day, the pressures involved do not add up. The periodontium is resilient to such pressure applications and quickly rebounds from intermittent force applications at the dentition [3,4].

Tongue thrusting in the absence of an accompanying abnormal rest posture of the tongue and mandible, need not be treated just because it is there. Many adults with normal dentitions and a retained tongue thrust do not require treatment. When tongue thrusting is seen with an anterior open bite, the thrusting is considered to be an adaptive response to a structural condition already there, rather than being its cause [5]. The only reasonable claim that can be made for any negative impact of tongue thrusting on the dentition is that the thrusting may help to maintain or exacerbate a developing malocclusion linked to other causation [4,5].

In some instances, tongue thrusting and abnormal tongue posturing may signal the presence of a retained sucking habit. As long as the sucking habit persists, so will the tongue thrusting. Overall, the observation of tongue thrusting with a forward tongue posture with mandible hinged open should encourage orofacial myologists to refer patients to an otolaryngologist for evaluation of the posterior airway. Abnormalities seen anteriorly should serve as a clue to evaluate posterior structures and the airway [5].

## The Role of the Otolaryngologist with OMDs

The possible contributions of orofacial-pharyngeal-nasal airway interferences to the presence and elimination of OMDs need to be fully evaluated and treated by otolaryngologists before myofunctional therapies are initiated to resolve abnormal oral functions and postures. Airway interferences associated with OMDs may include obstructive tonsils and adenoids, structural nasal obstructions including hypertrophied nasal turbinates, a deviated septum, a constricted anterior nasal (liminal) valve, and allergic rhinitis, non-allergic rhinitis, and mixed rhinitis. Orofacial myofunctional therapy will not be successful until airway interferences are resolved. This clinical caveat in orofacial myology recognizes the importance of an airway and allergy assessment by an otolaryngologist prior to the initiation of orofacial myofunctional therapy.

## A Clinical Guideline

Prior to examination it is suggested to instruct young patients to blow their nose since many children have poor nasal hygiene. Nasal debris can increase nasal resistance during quiet respiration up to 50% [5,6,7]. An inability to properly manage nasal debris encourages a mouth open posture and mouth breathing. Teaching a young patient to monitor and clear nasal debris is an appropriate component of a myofunctional treatment plan and a logical recommendation an otolaryngologist can make regarding a patient’s self-management of the airway.

## The Role of the Orofacial Myologist

In addition to the goal of establishing a normal vertical rest dimension between the jaws and teeth, the therapy procedures of the orofacial myologist will also focus on establishing and stabilizing a nasal pattern of breathing following successful resolution of airway interferences by the otolaryngologist. A lips-together rest posture can be achieved if and when a nasal pattern of breathing is established.

Therapy procedures will include exercises to reposition the tongue tip at rest and during swallowing, usually at the area over the incisive foramen that orofacial myologists refer to as “the spot”. Tongue thrusting will be addressed during both speech and swallowing when there is an accompanying open freeway space.

The procedures of orofacial myofunctional therapy have been shown to be successful with regard to establishing nasal breathing, normalizing the freeway space, repositioning the tongue, and achieving a lips-together rest posture [8-19].

## Summary

Otolaryngologists can provide important evaluation and treatment services for patients with Orofacial Myofunctional Disorders (OMDs) since the primary causes of OMDs are unresolved airway interferences including allergies. While tongue thrusting has been historically over-emphasized and incorrectly linked as a primary cause of some dental malocclusions, the importance of the dental freeway space, a mandibular open rest posture, and adaptive repositioning of the tongue, have been identified as the primary links with some malocclusions such as anterior open bite, posterior crossbites, and Class II malocclusions with maxillary incisor protrusion.

Knowledge of the characteristics of patients with OMDs, and the differences between oral rest posture abnormalities and functional activities such as tongue thrusting, and the primary causes of OMDs of airway interferences, should help to facilitate and improve interdisciplinary communications between otolaryngologists and orofacial myologists.

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