

TREATING LIP INCOMPETENCE

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INTRODUCTION

Treating children with lip incompetency raises several questions that should be asked and answered: **1)** Since the growth of the lips continues up to age 17, and since lip competency should be expected around age 13 (Vig and Cohen, 1979), on what basis should therapy be offered, or declined, for those children under age 13, or even up to age 17? **2)** How can clinicians who provide lip exercises for children determine whether the gains achieved in lip length are related to the therapy provided or to spontaneous lip growth? and **3)** What morphological factors can account for lip incompetence?

With regard to the first two questions, the clinical protocol for accepting individuals into therapy who have lip incompetence should involve a frank and detailed discussion with the child and parents about the growth patterns for the lips, as per the data of Vig and Cohen (1979). Also, the various morphological factors that can contribute to lip incompetence that may preclude success in therapy should be discussed with patient and parents following the initial patient examination.

Morphologic Factors Related to Lip incompetence: As mentioned, there are several morphological factors that may accompany lip *incompetency* at all ages and that may preclude therapy success if not corrected prior to orofacial myofunctional therapy. Some of these contributing factors include: **1)** Untreated airway interferences that may include, variably: enlarged faucial tonsils; adenoidal hypertrophy that interferes with airflow into the nose; allergies including allergic rhinitis; hypertrophy of mucous membranes of the nose; bony irregularities within the nose such as hypertrophy of nasal turbinates or a deviation of the nasal septum; polyps at the posterior choanae; or a constriction of the anterior nasal valve (liminal valve). A thorough examination by an ENT specialist and allergist is needed prior to orofacial myofunctional therapy when any airway interference is observed or suspected. **2)** Protruded upper incisors that prohibit individuals from achieving lip competency (Simpson, 2016); **3)** A severely retruded mandible which may need to be advanced orthodontically or surgically; **4)** The dental condition of an anterior open bite that can be severe enough to render the individual incapable of achieving lip competence due to the severe increase in the dental and skeletal vertical dimensions of the lower face; and **5)** A lack of lip closure often seen with the skeletal condition of *vertical maxillary excess* in which there is excessive, unwanted downward growth of the entire maxilla.

If the maxillary posterior dentition is displaced downward more than the anterior dentition during unwanted differential eruption, bite closure occurs in a manner in which the lower molars meet sooner than normal with the over-erupted maxillary molars, and an anterior, very “toothy”, skeletal open bite is the expected result. The dental result that includes a gummy smile relates to over-eruption of anterior teeth along with vertical drift of the anterior maxillary alveolus –although maxillary posterior eruption is greater (Mason, 1988; Hanson and Mason, 2003).

A Possible Role for Orofacial Myofunctional Clinicians With Adults There is currently an untapped role for the orofacial myofunctional clinician with such patients. After surgery to superiorly reposition the maxilla has been performed on patients with *vertical maxillary excess*, additional therapy by an orofacial myofunctional clinician may be needed to exercise the flaccid lip muscles that characterize such patients (Mason, 1988; Hanson and Mason, 2003) and to further normalize the relationship between the upper lip and upper incisors.

Orofacial myofunctional clinicians can also play a role with patients under orthodontic or oral surgical care. In some instances before or after orthodontic treatment, and before or after oral surgical correction of orthognathic jaw deformities, therapy to exercise and strengthen flaccid lips will be helpful.

Since it is not always possible for an orthodontist or oral surgeon to ‘set up’ the dentition with lips together in repose, and with the lower lip covering 2-3 mm of upper incisors (Vig and Cohen, 1979), some additional therapy protocols intended to exercise and lengthen the lips may be needed. Information regarding the ideal relationships of upper and lower lips, the anterior teeth and excess gingival display are considerations that orofacial myofunctional clinicians should note and address in the initial exam of such patients.

Many patients with jaw growth problems will also exhibit flaccid lips (Mason, 1988) that will need to be lengthened and strengthened following jaw surgery or during or following orthodontic treatment. Orofacial myofunctional clinicians are encouraged to remind referring orthodontists and oral surgeons about the important role they can play by providing post-operative exercises to lengthen and strengthen the lips for those patients with retained lip incompetence.

Eversion of the Lower Lip: Because a flaccid, everted lower lip is often seen in individuals referred for orofacial myofunctional therapy, a brief discussion of an excessive “roll” or eversion of the lower lip seems warranted. An everted lower lip, with flaccidity, is a common finding among children with repaired unilateral or bilateral cleft lip (Bateman and Mason, 1984). The reason for this is usually linked with the difficulty in initial lip closure surgery at around 6 weeks of age to join the parts of the separated orbicularis oris musculature across the upper lip area. The result of a lack of muscle integrity in the upper portion of the anterior oral sphincter becomes evident later on as an everted lower lip, with palpable flaccidity.

The clinical situation involving a lack of muscle unity across the upper lip area, with an everted lower lip, presents another important opportunity for orofacial myofunctional clinicians. For children with a repaired cleft lip who are facing an additional revision surgery to achieve muscle union across the upper lip area, many surgeons, parents and patients may appreciate a period of trial orofacial myofunctional therapy to attempt to reduce or eliminate an everted lower lip with resistance exercises. If therapy is successful, perhaps no further lip surgery will be needed? This scenario is another example of an untapped role for orofacial myofunctional clinicians with patients seen on a cleft lip and palate team.

The Unique Anatomy of Lip Musculature: The musculature of the lips presents a unique anatomical situation for applying the myofunctional therapy techniques of muscle resistance. As is well known, resistance exercises result in the shortening and thickening of skeletal muscle fibers. Adding stretching exercises to the primary therapy exercises for the anterior oral sphincter can result in lengthening of the upper lip. How does this occur? The Button Pull exercise strengthens the many muscle fibers imbedded within the orbicularis oris. Stretching exercises applied downward from the upper limit of the labial vestibule at the base of the nose serve to create vertical resistance against the horizontal fibers of the oral sphincter. The resistance within the oral sphincter itself, both horizontal and vertical, combine to lengthen the philtrum. The unique anatomy involved within the orbicularis oris sphincter, in the absence of any bony connections, involves the bulk of musculature directed horizontally across the upper and lower lip areas. The resulting shortening of muscle fibers within the sphincter then helps to elongate the upper lip as stretching exercises are applied perpendicular to the horizontally-directed orbicularis oris musculature.

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