REVIEW ARTICLE

Oral gymnastics - Way to a harmonious dentition

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Abstract

The facial musculature has important roles in performing a variety of orofacial functions such as speech, mastication, and swallowing. Exercises associated with the function of the muscles of the face and lips can be called orofacial myofunctional exercises. One of the important elements of myofunctional therapy includes facial and tongue exercises in order to promote proper tongue position, improved breathing, chewing and swallowing. Orofacial muscle exercises are a part of interceptive orthodontic treatment, which if employed in early ages can help to reduce the severity of dental malocclusion. Furthermore, the management of deleterious oral habits can be carried out via these exercises. In addition, there can be an improvement in the muscle tone and speech of the patient that leads to a harmonious orofacial functioning. This therapy doesn't just address the oral cavity but all the facial muscles; the head and neck. It facilitates nasal breathing, proper functional posturing, and chewing.

Keywords: Facial musculature, myofunctional exercises, oral gymnastics

Introduction

The teeth and surrounding structures are constantly under the influence of the surrounding musculature. Tongue along with the muscular mechanisms holds the teeth and supporting structures in a state of equilibrium. Any imbalance in the equilibrium alters the balance and leads to malocclusion. Various circumoral exercises help to intercept aberrant muscle activity and the resultant malocclusion.[1]

Malocclusion may be caused by abnormal functions such as mouth breathing, tongue thrusting, abnormal swallowing and unilateral chewing. All muscles exert their influence by virtue of their origin and insertion. Forces from unintentional and habitual behaviors, constantly acting on the maxillofacial and alveolar regions can cause the bony structure to deform resulting in jaw non-uniformity and malocclusion. The muscles of the tongue, lip, cheeks are important in guiding teeth into their final position and any variation in muscle form and function affects the position of the teeth.

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Goals of Muscle Exercises

Muscle exercise/gymnastic is a functional therapy by which muscles are trained in a specific way such that they attain the proper form, function along with the stability of surrounding hard and soft tissues. The goals of oral gymnastics are to promote a lip seal, palatal tongue rest position, a proper swallow and facilitating nasal breathing. They also help in correcting dysfunctional habit patterns. Muscle exercises are divided into four major types. They are lip exercises, tongue exercises, masticatory muscle exercises and breathing exercises.

Lip Exercises

The lip seal therapy or exercises have been valuable in the correction of the poor posture of musculature, which is required for increasing the thickness of muscles that helps for creating a lip seal and helps the patients acquire normal habits.[3] Lip training also increases lip size and improved lip function in people with incompetent and small lips.

If there is a patient with hypotonic short upper lip, the patient is asked to stretch the upper lip over lower lip without opening the mouth. The holding time is 30 s with a frequency of 15 to 20 times a day [Figure 1a]. This will improve the tonicity of upper lip. Another exercise is asking the patient to stretch the upper lip in a posterior inferior direction towards chin by overlapping the lower lip, which additionally helps in maintaining the oral seal during swallowing.[4]

Another lip exercise is performed by tightly closing the lips together that helps to increase the competency [Figure 1b]. Lip puffer exercise involves forcing the air or liquid in between the upper and lower lips and puffing out the lips to the farthest extension. It should be repeated 5-10 times/day [Figure 1c].

Button pull exercise is another one in which a button of 1-1.5 inch diameter is taken, and a thread is passed through the button holes. The patient is asked to place the button behind the lips and pull the thread outwards while resisting it with tight lip seal. Next lip exercise involves holding and splashing of water back and forth behind the lips as if done during gargling between the lips until they get tired. The patient is also asked to puff the air behind the lips and cheeks. Patient should not break the lip seal. In the case of incompetent lips, to achieve a satisfactory lip closure, the patient is asked to press lips tightly together for 5 s, relax and repeat 5 times.

Another useful exercise recommended by the dentists is the "gum drop exercise" in which a large size gum drop is taken, approx. 1 ounce. An 18-20 inch string, depending on the height of the patient is taken. One end of the string is attached to the gum drop, and the other end is behind the teeth and held with the lips. The patient is asked to place his/her hands behind the back and to bend forward till the face is parallel with the floor and the string is stretched. Then the patient is asked to open his lips and stretch them as far down as possible, and the same procedure is followed 5-10 times a day.

A similar exercise is the "card pull exercise" that follows the principle of tug of war, in which the patient holds the card with one hand and tries pulling it. At the same time, the patient tries to holds the card tightly between the upper and lower lips [Figure 1d].

Tongue Exercises

Many malocclusions develop as a result of abnormal tongue habits like tongue thrusting or aberrant tongue swallowing patterns. Intervening such habits with the institution of popping myotherapeutic tongue exercises and training in correct swallowing techniques as early as possible is one of the recommended methods for curbing the habit in most patients.[5]

One of the effective exercises is the 4S exercise. This includes identifying the spot by tongue, salivating, squeezing the spot and swallowing. The 4 steps are as follows:

i. Spotting exercise (1S) - Spot should be the rest position of the tongue.
ii. Salivation exercise (2S) - The tongue is placed on the spot, which results in salivation.
iii. Squeezing exercise (3S) - The tongue is squeezed vigorously with the teeth closed against the spot followed by relaxing.
iv. Swallowing exercise (4S) – After squeezing, the next step is to swallow the spot. This new swallowing pattern should be practiced at least 40 times a day.

In this exercise, the control of reflex is transformed from conscious to unconscious at a conscious level, and it is necessary that the patient should reinforce the new swallowing pattern subconsciously. Patient is instructed to hold the citric acid tablet with bi-concave surface using the tongue tip against the hard and soft palate as long as possible. Gradually the duration is increased. The parents should be informed to divert the patient's concentration towards a hand held clock and patient should be asked to note down the duration of holding the tablet in the correct position.[6]

The patient can be guided regarding the correct posture of the tongue during swallowing by the use of elastics also.[1] These exercises are the one or two elastic swallow [Figure 2a and b].

"Hold pull exercise" is a tongue exercise, in which tip of the tongue is made to contact the palate in the midline at the crest of the hard palate. Then the patient is asked to gradually open the mouth without a tongue losing the contact with a palate. This exercise helps in stretching the lingual frenum [Figure 2c].

Figure 1: (a) Lip pulling exercise (b) Lip pressing exercise (c) Lip puffing exercise (d) card pulling exercise

Figure 2: (a) One elastic swallow tongue exercise (b) Two elastic swallow tongue exercise, (c) Hold pull tongue exercise (d) Tongue extension/protrusion exercise

Tongue retraction exercise is performed by touching the back of your tongue to the roof of your mouth and holding it for 1-3 s. It is also repeated for about 5 times.

Tongue extension exercise is performed by protruding the tongue between lips and holding it steady and straight for 3-5 s. It is repeated for about 5 times [Figure 2d].

Habit Breaking Exercises

Mouth breathing habit is one of the deleterious habits having many causes ranging from sinus problems to sleep Apnea, enlarged tonsils or adenoids. This type of breathing is dangerous, increasing the risk of coronary disease, anxiety and dental problems in children. To get rid of mouth breathing, one can take steps at home that will help in retraining oneself to breathe through the nose instead of the mouth. There are 3 main steps to be performed.

i. In the first step, cold and allergies should be treated as soon as symptoms become apparent. Blockage in the nasal passage worsens mouth breathing, especially during sleeping hours.
ii. In the second step, breathing through the nose is practiced several times during the day. Rapid inhalation and exhalation is performed through the nose, keeping the mouth closed but relaxed. This is tried for three in-and-out breath cycles per second while it promotes a proper breathing technique.
iii. The third and final step is to sleep on the back. This opens the airways and takes pressure off the sinus cavities, stimulating air exchange through the nose instead of the mouth.

Cheek Exercises

In order to enhance the tonicity of the cheek muscles, water is taken inside the mouth and move from side to side. Furthermore, the tongue is rolled from right-left/left-right cheek [Figure 3a and 3b]. If it is done properly, it also works on lateralization and coordination of tongue movement.

Puffing of cheeks is another exercise in which the cheeks are filled with air, and the air is moved from one cheek to the other 5-10 times. It should be kept in mind that no air should escape from around the lips or the nose. It is repeated for about 5 times.

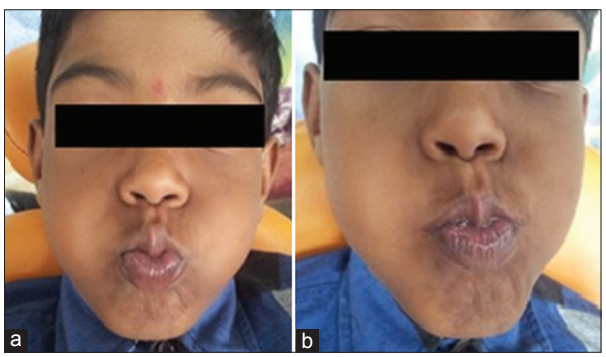

Figure 3: (a) Water holding cheek exercise (b) Cheek puffing exercise

Breathing Exercises

The morphology and overall facial appearance is greatly affected by mouth breathing especially during the growth period. Nasal breathing apart from enabling an adequate growth and development of the craniofacial morphology also interacts with other physiological functions such as chewing and swallowing. There are three major breathing exercises i.e. pranayam, blowing balloon and holding water in the mouth and breathing through the nose.

In order to perform pranayam, inhalation and exhalation is done rapidly through the nose, keeping the mouth closed but relaxed [Figure 4]. Three in-and-out breath cycles per second should be tried and done.

Blowing of balloon exercise can be done by breathing deeply through the nose and then exhaling through the mouth. Balloon in your mouth and repeat the breathing exercise until you have exhaled a total of 5 breaths into the balloon.

Exercises by Wind Instruments

Playing wind instruments crucially depends on the ability to control the orofacial muscles and actually may be an interceptive orthodontic procedure.[7] Both vocal and wind instrument sound production entail the use of involved facial muscles, for example, in the movement patterns of lips, jaw, and tongue during the articulation. Therefore, motor control of these structures is a key component of sound production for both vocal and wind instrument performance.[8]

Use of trumpet will help in strengthen the lips and cause the tongue to confine its action within a definite area. The area of lips, which come in contact with a mouthpiece will feel a stimulating effect and fuller flow of blood to the musculature. By continued use of this instrument hypotoned tissue will develop a normal tonicity and short flabby lips will lengthen. During the use of this instrument, the tongue is raised from the floor of the mouth and stimulates the tissue of lower lip and reduces tension in the upper lip [Figure 5].

Figure 4: Pranayam breathing exercise

Figure 5: Trumpet blowing exercise

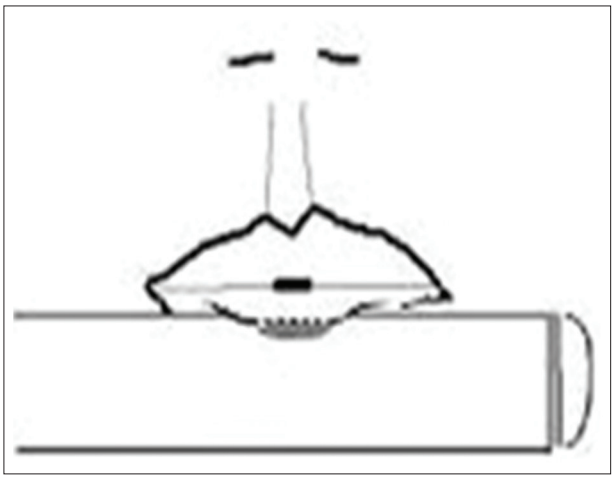

Figure 6: Flute playing exercise

For playing Flute, the lower lip rolls over the side of the head of the instrument and upper lip is stretched downward, and the air is directed into the instrument [Figure 6]. This instrument is useful in those cases where patient is having short upper lip; strong muscle activity and protruding lower lip.

Conclusion

A change in muscle function can initiate morphologic variation in the normal configuration of the teeth and supporting bone, or it can enhance an already existing inherent malocclusion due to compensatory or adaptive muscle activity and functions. These simple and effective orofacial muscle exercises can help in the creation of a favorable lip seal along with other muscular changes as early as possible to; thereby assisting in the normal dentofacial development. It eliminates/reduces the complexity of the orthodontic treatment as the deformity is limited.

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