

Lip Exercises in Orthodontics

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Introduction

- ◎ A “perfect smile” can be defined as interaction amongst teeth, gingival scaffold and lip framework .



Gummy smile

is one that shows more gum than usual when smiling.

- ◉ the proportion of gum that should be shown when smiling is about **3-4 mm** in the case of women, and **2 mm** in men, to be considered as a gummy smile.



The Excessive gingival display

caused by

- ⦿ vertical maxillary excess
- ⦿ short length of the upper lip
- ⦿ gingival enlargement
- ⦿ Short upper teeth
- ⦿ combination of above



Treatment of short lip



the injection of the
botulinum toxin of type
A

lip re-positioning

myectomy

hyaluronic injection

combinations

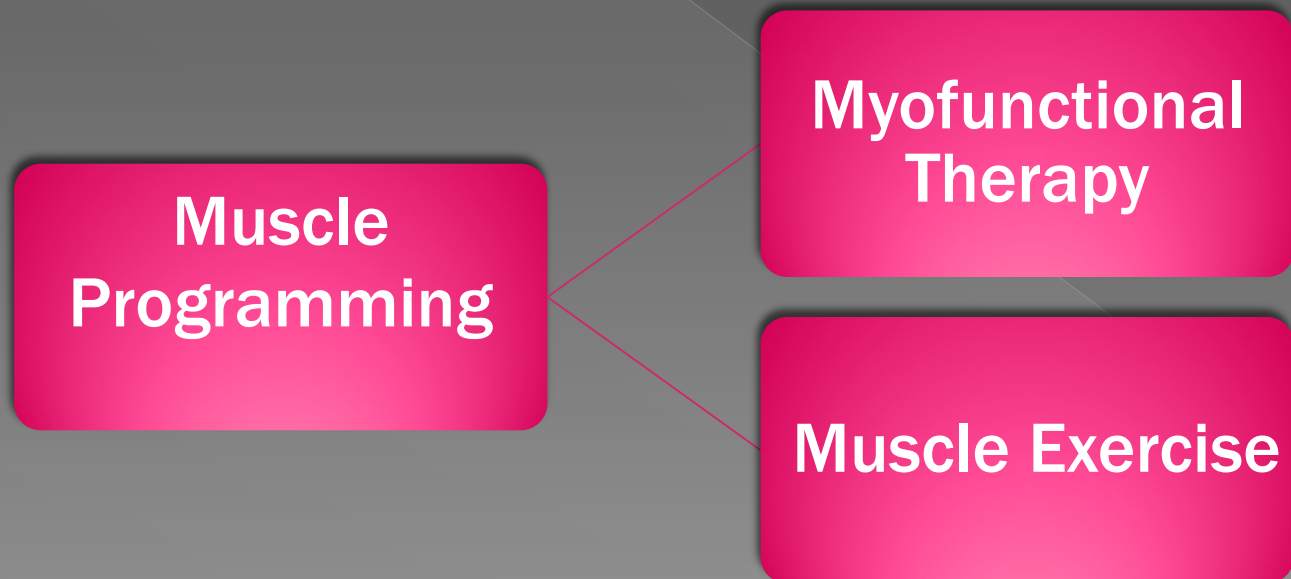
- ⦿ A modern muscle-training had been developed and Myofunctional therapy has been aided with using tools which have not been entirely orthodontic, referred to as exercisers



exercisers

Muscle Programming

- is a term applied to process by which muscles are trained in a specific way to attain proper form, function and stability of hard and soft tissues in surrounding.



Muscle Exercise

- the Controlled Rhythmic contraction of the muscles around the teeth and jaws to achieve normal function and development of these structures.



Lip exercises

⦿ A lip exercises is therapy simply utilizing the gymnastic exercises or the exercises for the neuro-muscular re-education.



History

- ◎ Roger in 1930 , Canadian student of Angle had designed exercise (salted hot water exercise)that remains utilized in the present day for the treatment of the hypertonicity in the orofacial musculatures.
- ◎ Ingervall in 1982 studied the effect of lip training on the morphology of the lips, which resulted in the increase of the height of both lips as well as the decrease of inter-labial gap .

- ◎ **Ooya** in 2009 examined lip training method by measuring **oxygen saturation (oxygenated hemoglobin and deoxygenated hemoglobin levels)** in the orbicularis oris muscle , determined effective training conditions as **aerobic exercise** and **hypoxic exercise**.
- ◎ **Yoshizawa** in 2018 study the effect of **hypoxic lip training on lip incompetence** by electromyographic analysis of the orbicularis oris muscle.

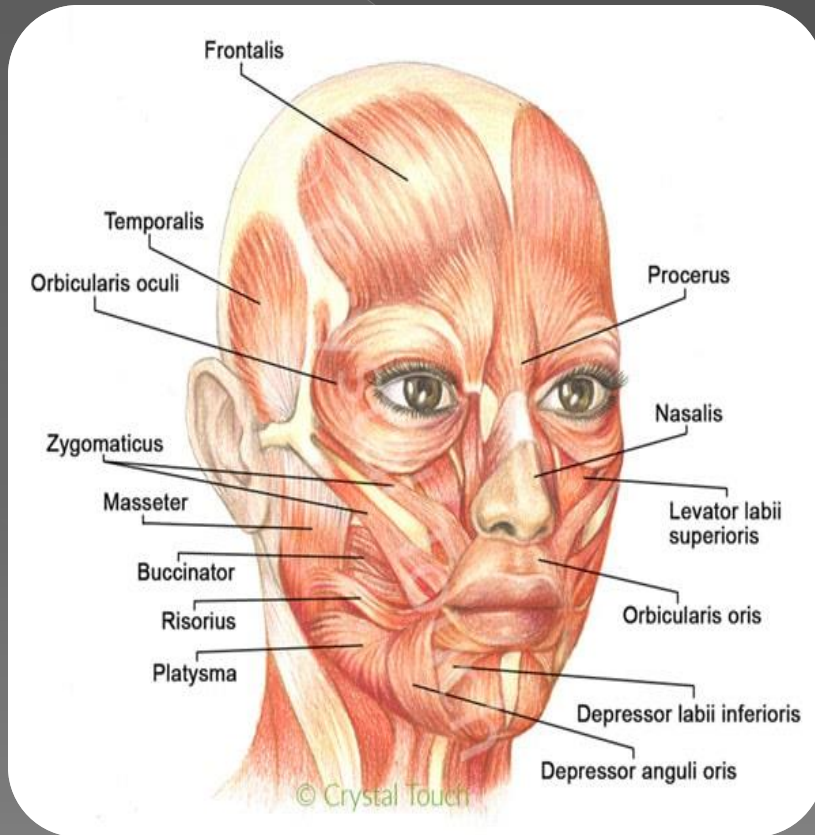
Purposes of lip Exercises

- ⦿ Increase the muscles strength and thickness, which is helpful in the creation of lip seal.
- ⦿ Correction of short upper lips, which is the main gummy smile causes.
- ⦿ Significantly decreases the obstructive sleep apnea through the increase of the lip closure force and the strengthening of lip muscles .

Growth of the Lips

- The upper lip grows at a steadier rate than the lower lip, reaching its full potential by **age 17-19**, while for the lower is between the ages of **9 - 13**.
- lip line in females is **1.5** mm higher than the lip line in males.
- the strength of the lip higher in the males than females.
- the strength of the lip is lower in older than young individuals.

Anatomy and Function of the lip muscles



Functional Group	Muscles
Oral constriction	Orbicularis oris
Lip depression	Depressor anguli oris Depressor labii inferioris
Lip elevation	Levator labii superioris Levator labii superioris alaeque nasal Zygomaticus major Zygomaticus minor Levator anguli oris
Lip retraction	
Upper lip	Zygomaticus major Zygomaticus minor Levator anguli oris
Commissure	Risorius
Lower lip	Depressor anguli oris Platysma
Lower lip protrusion	Mentalis

Orbicularis oris muscle consists of:

- ◉ 71.8 % muscle fibers of type II, which represent fast-twitch fibers → hypoxic exercises that are related to the strength of the muscle.
- ◉ 28.2 % type I muscle fiber, which are slow-twitch fiber types → aerobic exercise that is related to the endurance of the muscle

2 reasons for increasing the sealed lip ratio with the muscular training of the hypoxic orbicular oris.

- aerobic training cause reinforcement of type I muscle fiber that results in the increase of the muscular endurance of the orbicular oris instead of the muscular strength.
- hypoxic muscle training cause reinforcement of the type II muscle fibers enhancing the strength as well as endurance of the orbicularis oris muscle



Types of lip exercises:

1.Lip puffer

- ⦿ forcing of liquid or air between lower and upper lips and puffing lips out to maximum degree. It has to be repeated **5 to 10 times a day**.
- ⦿ Pump hot salt water behind the lips back and forth for **4-5 times** then spit that water out and repeat the process. Half glass of water is utilized at a time.



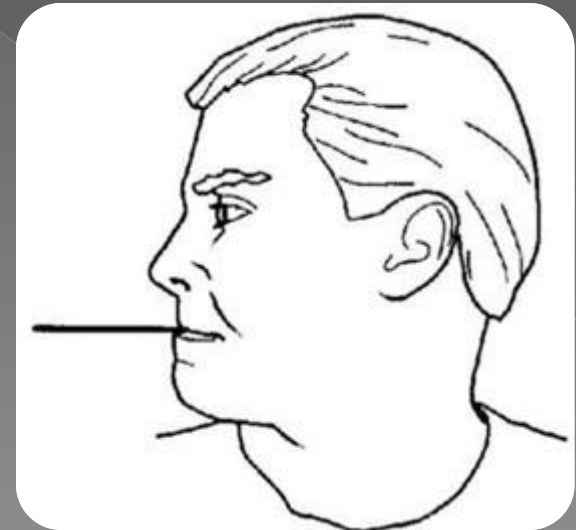
2.Lip pull Exercise

- the patient stretch upper lip over the lower one without opening mouth. The time of the holding is **30sec with a rate of 15-20 times** a day, which will result improve the upper lip's tonicity .
- helps to increase the competency.



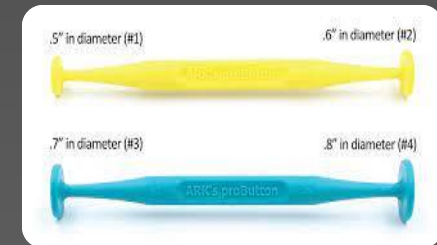
3.Card pull exercise

- The patients tightly hold a card between upper and lower lips and attempts to pull it by hand.



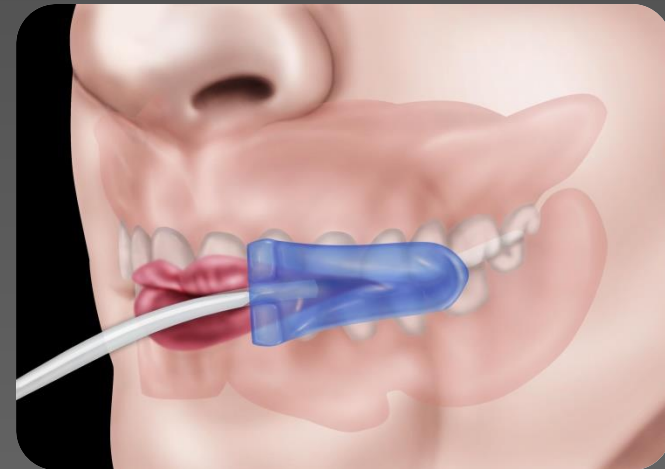
4. Button pull exercise

- A 1 -1.5 inch diameter button is taken, after that, a thread passes through the holes of the button.
- the patient to put the button behind their lips and pull thread outward whereas resisting it with a tight lip seal.



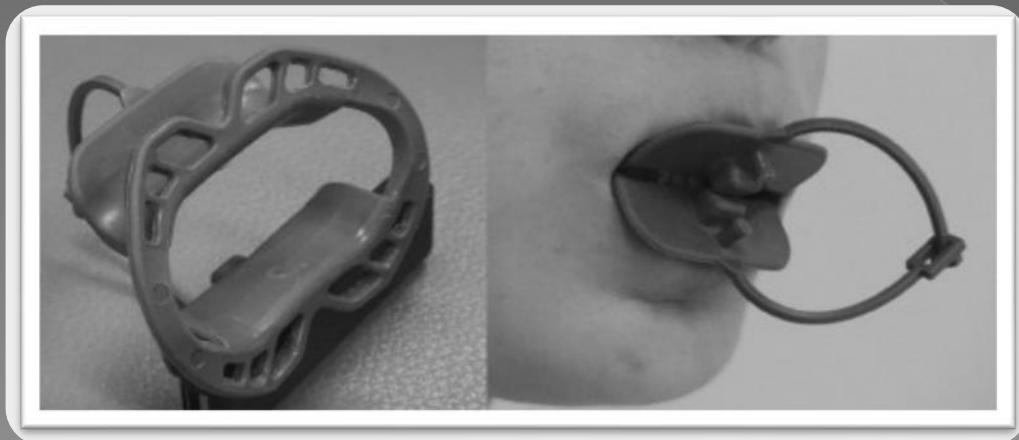
5.The Iowa Oral Performance Instrument (IOPI)

- developed in 2001
- utilized for the measurement of the strength of the tongue, cheek and lip
- Used for the strengthening the muscles of the lip with the bio-feedback characteristics for the exercising of the oral motor.



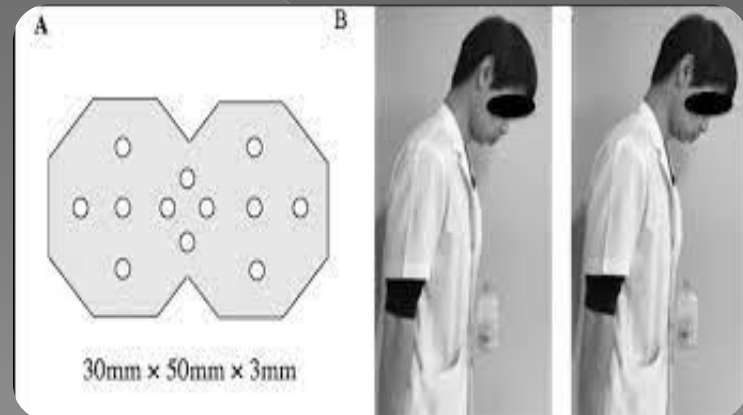
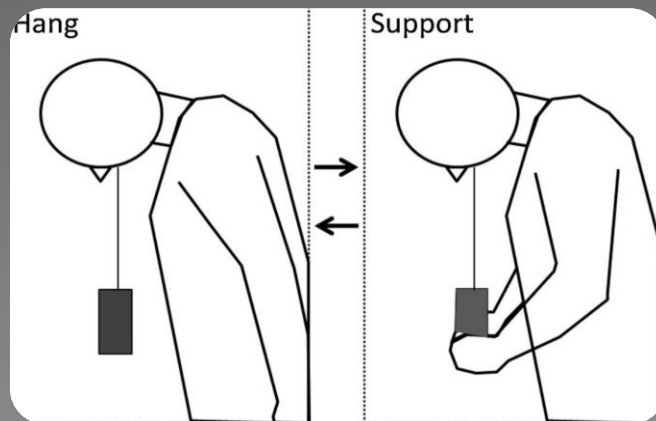
6. Lip muscle strength fixation device *Patakara*® lip trainer

- produced from resilient and flexible rubber and plastic set to lower and upper lips loads a force that expands those lips, the patient close the lower and upper lips against that force.
- **4 sessions daily**, each session was **5min** long for a period of **two months**, which results in the improvement of the strength of lip-closing.



7. Hypoxic training of the lip

- A traction plate is inserted in upper and lower oral vestibules and attached to weight (80% of the maximal tensile strength of the orbicularis oris) with the strings. Subjects stand and tip their head forward.
- This training involves hanging of the weight for 5s, supported by lips only and after that, supported in hands for 5s carried out five times .
- every day for four weeks. In the case where it had increased at two weeks after the beginning of this training, a weight that is equivalent to 80% of new value has been utilized instead.



8. Myobrace lip trainer

- designed for achieving sufficient lip seal and strengthening the muscles of the lips.
- utilized for **5min twice a day**.
- The lips are closed over Lip Trainer™, the strap is horizontally held and pulled on it at the same time as keeping lips tightly squeezed together.



Conclusion

- ❖ Lip exercise significantly Increase muscles strength and thickness and this will lead to creation of lip seal and Correction of short upper lips.
- ❖ Different types of lip exercise used for the creation of normal function and health in orofacial musculature, but not replace the mechanical appliances.

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