

The effects of the MYO appliance in children with malocclusions of the primary dentition

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The myofunctional device variously called: "Munchee," "Chewer" MYO or O.P. device has been extensively researched for the past 30 years both in Australia and Japan.

In Australia, clinical research has shown the "MYO" to be an excellent therapeutic modality in the treatment of open bites and anterior protrusions of the mandible. In Japan research was done at Osaka Dental University, under the chairmanship of the Dean Professor Toyoda Heida, involving faculty members Dr. Masihiko Mine, and Masihiko Yoshihara. Their results, involving plaque control, cranio-facial muscle competence, changes in gnathic relationships, salivary gland secretions, were all positive, suggesting that myofunctional therapy with the "MYO" should be routine therapy for all children, particularly those between the ages of 3 and 6 years, when the stomatognathic system is at its most important state of development. Many members of the Australian Academy of Orthopaedic Orthognathics have found the "MYO" to be a superb adjunct in the field of functional appliance therapy, where it not only gives authority to the cranio-facial musculature, but by therapeutic massage of the oral tissues, it maintains them in states of health through extensive treatment periods.

This exciting information has been researched at Osaka University for some time, with detailed findings to be published by Dr. Yoshihara in 1991.

Speech therapists are now very interested in the myofunctional device, noting that many speech defects in young children are directly related to faulty occlusion.

In cases of severe skeletal or dental malocclusion, the infant should be encouraged to exercise the stomatognathic system for about 30 minutes daily. In such cases improvement may be expected in the occlusion and appearance of the infant in periods sometimes as short as 3 months. As with functional appliance therapy, compliance can be a real problem, and so the dentist needs the help of a "Motivating Kit" which consists of a small album, showing the excellent before and after results, which have been obtained in other infants, after constant daily use.

Where no gross orthodontic problem exists, regular daily use of the myofunctional device (MYO) for about 4 minutes, helps improve the alignment of the anterior teeth and gives authority to all musculature of the

stomatognathic system. The appliance if used as directed has excellent preventive potential.

Practitioners involved in treating open bites, and tongue posture problems, have in the past, made use of myofunctional therapists and custom made appliances to discourage abnormal tongue habits. These appliances were constructed with spikes or guards to discourage aberrant tongue posture. Many practitioners found the above methods inconvenient for the parent or the child with unpredictable results. The use of the MYO suits well the philosophy of the functional orthodontist.

When the MYO appliance is placed in the mouth for a sustained period, such as when an infant is watching television, then that infant is trained to breathe through the nose. Most functional orthodontists emphasize the importance of nasal breathing for proper facial development.

Dr. R.M. Ricketts found that if the nasal cavity is not developing properly then the palate will frequently be elevated in front. The diet in the modern world is insufficient in fibre content to activate sufficiently the facial and pericranial musculature. There is much truth in the saying that "stasis is the basis of disease."

The MYO provides the necessary exercise to oxygenate and empower the muscles of the stomatognathic system. Just as modern man needs a combination of aerobic and strengthening exercises to keep his body fit so also does one need a non-traumatic exercise for the pericranial, facial and neck musculature.

When MYO therapy is used the blood supply to the musculature has been shown to increase between 6 and 20 minutes. Dr. R.M. Ricketts has stated that the need for early treatment, mentioning that he frequently commenced treatment on 4 and 5 year old children. Now with the availability of the "MYO," treatment may be commenced as early as 3 years. The young bone is very susceptible to environmental influences both good and bad, and many habits such as thumb sucking and mouth breathing can be countered and often completely nullified with MYO therapy.

Osaka Dental University has research work to show that the competence of the orbicularis oris can be doubled in most 3 to 6 year old children in a 3 month period.

TABLE 1 - Development of myodynamic lip force observed in the children who had used OP device for 20 minutes a day continuously for 9 months (Normal occlusion)

Sample	Age	Before Op	3m later	6m later	9m later
1	3	350	450	600	700
2	3	400	525	700	750
3	3	300	425	550	600
4	3	350	300	425	600
5	3	325	400	650	700
4	3	375	400	450	500
7	3	450	450	500	550
8	3	525	550	700	700
9	4	600	750	850	900
10	4	400	400	550	750
11	4	650	700	850	900
12	4	350	425	470	495
13	4	375	400	475	600
14	4	375	400	600	650
15	5	550	650	650	800
16	5	600	800	1000	1000
17	5	400	500	700	1000
18	5	500	650	725	800
19	5	550	660	800	800
20	5	300	350	500	600
21	5	550	650	700	900
22	5	650	700	850	850
23	5	700	750	900	925
24	5	500	600	60	650
25	6	500	575	625	700
26	6	450	650	650	700
27	6	575	650	1000	1000
28	6	375	450	800	850
29	6	475	550	750	900
30	6	700	650	900	1000

(unit:gram)

Table 2 - *Development of myodynamic lip force observed in the children who had used OP device for 20 minutes a day continuously for 9 months (Abnormal Occlusion).*

Sample	Age	Before Op	3m later	6m later	9m later
1	3	200	225	225	350
2	3	250	300	350	375
3	3	200	200	350	400

4	3	100	150	250	300
5	3	400	450	500	500
6	3	250	400	700	750
7	3	100	325	400	500
8	3	150	400	650	675
9	4	175	200	525	650
10	4	250	300	400	525
11	4	300	350	500	700
12	4	200	150	300	350
13	4	500	550	700	700
14	4	150	250	700	725
15	4	250	400	700	750
16	4	150	350	1000	1000
17	4	450	500	700	850
18	5	250	400	700	750
19	5	175	200	525	550
20	5	300	350	500	500
21	5	150	250	700	725
22	5	200	450	800	950
23	5	250	450	60	750
24	5	250	450	800	800
25	5	300	450	600	950
26	5	350	500	800	825
27	5	400	500	800	800
28	5	375	400	550	550
29	5	325	400	600	625
30	5	500	700	750	750
31	6	400	550	700	950
32	6	400	600	600	700
33	6	500	500	550	700
34	6	500	750	750	900
35	6	425	500	650	700
36	6	475	500	600	600
37	6	375	400	550	900
38	6	350	400	600	600
39	6	325	450	600	625
40	6	300	350	400	400

(unit:gram)

Note that the figures for children suffering abnormal occlusion are, after nine months' use of the MYO, generally better than those for children with normal occlusion.

They have scientifically shown that which we have always intuitively known that young children with developing malocclusions, always have impaired competence of the orbicularis oris. (See tables one and two)

Chewing on the device produces a copious salivary flow up to 30 times the resting flow rate, and certainly many times greater than any chewing gum which is currently being advertised as important in the remineralisation of interproximal enamel during the 20 minutes following food intake.

The MYO was originally called the "Chewing Brush" and the O.P. (Oral Prophylactic) device because of its capacity to physically remove plaque. As used by a child as a cleaning device only, it was shown to be about 20% more effective than a toothbrush, being exceptionally efficient on the lingual surface of the teeth.

As a therapeutic modality in the field of the physical therapist the myofunctional device may have an important part to play, both as a diagnostic device, and as an aid to treatment, when the occlusion is causing pathology in the cervical spine.

There are many instances in daily dental practice where a patient may gain help from the myofunctional device.

Case Reports

Case number 1: A.G. is a female aged 3 years and 4 months with a severe open bite and speech impairment related to the dental problem. (Fig 1) The child and mother were motivated for about 15 minutes on how to use the MYO. A.G. began chewing on the appliance twice daily for 2 minutes. This time was gradually increased to 4 minutes in a month. The open bite closed at the rate of 1 mm a month. (Fig 2)

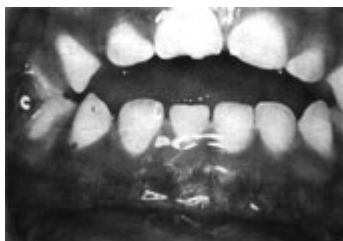


Fig. 1 A.G. is 3 years, 4 months old with a severe open bite and speech impairment.



Fig. 2 A.G. is shown posttreatment with an excellent occlusal relationship.

Currently, it is recommended in cases of this type that the child exercise with the appliance for 10 minutes daily after the first month and to leave it in the mouth for another 30 minutes. This results in faster improvement.

Case number 2: J.F. is a 2 1/2 year old female with severe Class III malocclusion (Fig 3) that was observed at age 2 years. Treatment was postponed until now and consisted of a Sim-type upper sagittal appliance with bands on the second primary molars. This appliance was activated for 3 months. The cross bite was corrected at this time, but it took another 3 months for the posterior to contact. (Fig 4)



Fig. 3 J.F. is 2.5 - years-old with a severe Class III Malocclusion



Fig. 4 J.F. is 3 - years - old with a Class I occlusion

All the time J.F. was chewing the MYO twice daily for 4 minutes.

Case number 3: A.E. is a 4 year 11 months old boy (Fig 5) who used the MYO appliance for a total of 18 months. The action of the MYO is thought to improve functionally of the musculature and esthetically the teeth and face. Perhaps all infants need aerobics for the face to keep the stomatognathic system developing to its full genetic potential.



Fig. 5 A.E. begins to use the appliance.

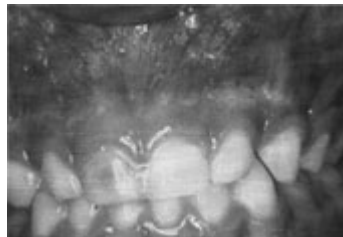


Fig. 6 A.E. is half way through the treatment



Fig. 7 A.E. is completed after 18 months of using the MYO.

Case number 4: S.B. shows a 48 hour plaque accumulation that has been stained. (Fig 8) After 3 minutes of chewing with the MYO most of the stained plaque has been removed (Fig 9). After 6 months of using the MYO, the open bite has been reduced and a normal occlusion is the result.



Fig. 8 S.B. shows stained 48 hour plaque accumulation



Fig. 9 S.B. uses the MYO for 3 minutes to clean her teeth.



Fig. 10 S.B.: after 6 months of using the MYO excellent occlusion is achieved