The TRAINER System in the context of treating malocclusions

By Dr. German Ramirez-Yañez, DDS,
& Pedo Spec, MDSc, PhD

Part 1 of three

Functional maxillary orthopedics (FMO), also known as dentofacial orthopedics, is the subject in dentistry that studies the treatment of malocclusions by stimulating or inhibiting the activity of the masticatory and/or facial muscles. Doing so stimulates modeling and remodeling of the maxillaries, permitting a better tooth alignment.

FMO helps to correct and treat all the functional problems that can be associated with incorrect positioning of the teeth (Ramirez-Yañez and Farrell, 2005) due to erroneous force delivered on the teeth by the muscles (Fujiki et al., 2004). Consequently, teeth tend to position better and to align correctly.

Therefore, the first matter that must be understood is that FMO's goal is to correct the position of the teeth, similarly to fixed orthodontics. However, traditional orthodontics only moves the teeth, and it is expected that the entire craniomandibular system (CMS) is going to adapt to the new position of the teeth.

FMO, on the other hand, produces a balance between the muscles of the CMS, followed by improving the relationship between the upper and lower maxillaries. Consequently, the teeth tend to position better.

In other words, orthodontics and FMO have the same goal — the way that goal is achieved is totally different.

There is a huge variety of removable appliances that may be classified as FMO appliances. However, they do not all produce the same effect on the CMS.

Some work by increasing the muscular activity of the masticatory muscles by positioning the mandible forward (e.g., Monoblock and Bionator); others stimulate the masticatory and/or facial muscles, thus improving the relationship between the mandible and maxilla through increasing the lateral excursions of the mandible (e.g., Bimler and some Simoes Networks); and others work on the buccal area of the mouth, stimulating the transverse development of the maxillaries while improving the position of the mandible (e.g., Frankel's Function Regulator).

Fig. 1: The T4K for treatment of developing malocclusion and myofunctional habits.

Fig. 2: The MYOBRACE for dental alignment and arch development.

More recently, new appliances have been developed that stimulate the masticatory and facial muscles and furthermore re-educate the posture of the tongue, bringing the CMS into a physiological equilibrium of the force delivered on the maxilla mandible and teeth. Some of these new appliances are the Simoes Network 2 and 3, as well as all the appliances composing the TRAINER System™.

It is very important to understand the modus operandi of each of the FMO appliances that are available to treat malocclusions. This permits the health professional to understand the philosophy behind each appliance, what the successes are and what the limitations that can be expected are when treating with each of them.

The TRAINER System

The TRAINER System is composed of various appliances that can be used accordingly with the age of the patient, including the Infant TRAINER, the TRAINER for Kids (T4K™) (Fig. 1), the TRAINER for Adolescents/Adults (T4A™), the TRAINER for Brackets (T4B™), the TRAINER for Class II malocclusion (T4CII™), TRAINER Lingua™ and the MYOBRACE® (Fig. 2). Although their indications may vary, all appliances within the TRAINER System, including the MYOBRACE, work in an identical way.

The goal of this paper is not to give the indications for each of the trainers, but to explain the way that all the appliances in the TRAINER System produce their effect when treating the various types of malocclusions. Those readers not familiarized with these appliances may find the indications for each of them and the appliances manuals at *www.myoresearch.com*.

Many orthodontists tend to see the MYOBRACE as a different appliance as it does not have the name TRAINER attached to its name. The MYOBRACE works similarly to the other trainers, stimulating the muscular balance of the facial and masticatory muscles, as well as re-educating tongue posture.

The only difference is that the MYOBRACE has a structure added (inner-core) to increase the resistance of the buccal shields, therefore counteracting the force delivered by the buccinators on the posterior teeth when the activity in those muscles is increased. This is further explained later. Also, the MYOBRACE includes additional channels at the area of the anterior teeth, which can deliver a direct force on the teeth improving their alignment.

Otherwise, the MYOBRACE maintains the specifications and features of the other trainers, and therefore, all the information provided regarding the modus operandi and the scientific evidence regarding the trainers is applicable to the MYOBRACE.

Thus, the purpose of this document is to explain how the appliances comprising the TRAINER System produce the changes observed in thousands of patients treated with these appliances around the world and to explain why the TRAINER System appliances guide the facial and masticatory muscles to work properly, as well as correct the imbalance of the force produced by an incorrect posture of the tongue. This document also shows scientific evidence supporting the use of FMO appliances and, particularly, the scientific research gathered from using the TRAINER System.

Modus Operandi of the TRAINER System appliances

As suggested by the name, the appliances of the TRAINER System just train or exercise the muscles at the CMS to physiologically load the bones, stimulating growth and development in the structure composing the CMS. Through development of the maxilla, the mandible and the dental arches, as well as by re-educating tongue posture, the teeth tend to position better and align correctly.

The effects produced by the trainers on the maxilla and mandible have been demonstrated through scientific studies (Usumez et al., 2004; Ramirez-Yañez et al., 2007), as well as through clinical cases successfully treated with these appliances and reported in the literature (Ramirez-Yañez GO and Faria P., 2008; Kanao et al., 2009).

Currently, there is ongoing research with the TRAINER System appliances focusing on understanding their effect on the muscular activity of the masticatory and facial muscles, as well as further investigating the positive effect the appliances can have in mouth-breathing patients and on some altered oral functions, such as swallowing.

In the next two parts of this article, the modus operandi of the TRAINER System appliances will be explained, considering separately their effect on the three dimensions of the mouth: sagittal, transverse and vertical.

Scientific literature supporting the physiological concepts involved on the effects produced by the trainers will be presented to further support the concept that the TRAINER System appliances (including the MYOBRACE) are a viable alternative to treat malocclusion.

Look for Part 2 of this article in the October issue of Ortho Tribune. References will appear at the end of Part 3. OT

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Analyzing the *modus operandi* of the TRAINER System Appliances

By German Ramirez-Yañez, DDS, MDSc, PhD

Part 2 of three

As suggested by the name, the appliances of the TRAINER System™ just train or exercise the muscles at the craniomandibular system (CMS) to physiologically load the bones, stimulating growth and development in the structure composing the CMS. Through development of the maxilla, the mandible and the dental arches, as well as by re-educating tongue posture, the teeth tend to position better and align correctly.

The effects produced by the trainers on the maxilla and mandible have been demonstrated through scientific studies (Usumez et al. 2004; Ramirez-Yañez et al. 2007), as well as through clinical cases successfully treated with these appliances and reported in the literature (Ramirez-Yañez GO and Faria P. 2008; Kanao et al. 2009).

Currently, there is ongoing research with the TRAINER System Appliances focusing on understanding their effect on the muscular activity of the masticatory and facial muscles, as well as further investigation of the positive effect the appliances can have in mouth-breathing patients and on some altered oral functions, such as swallowing.

In the following sections, the *modus operandi* of the TRAINER System Appliances are explained, considering separately their effect on the three dimensions of the mouth: sagittal, transverse and vertical. Scientific literature supporting the physiological concepts involved in the effects produced by the trainers is presented to further support the concept that the TRAINER System Appliances (including the MYOBRACE®) are a viable alternative in treating malocclusion.

Sagittal growth and development (antero-posterior)

The effect produced by the TRAINER System Appliances is in part similar to those functional appliances designed to stimulate mandibular growth and development by bringing the mandible forward into an edge-to-edge position (bionator, monoblock, twin-block, etc). By placing the mandible in such a position, the muscles protruding the mandible are stretched (masseter, medial pterigoid and lateral pterigoid muscles).

The TRAINER Appliances are recommended to be worn one to two hours during the day and 10 to 12 hours at night while sleeping. It was explained by Van der Linden and colleagues (Van der Linden, Frans & Proffit 2004) that all action maintained for more than six continuous hours produces an effect on the CMS.

The trainers maintain the mandible in a forward position for 10 to 12 hours during the night, keeping the muscles protruding the mandible stretched.

This makes the blood vessels in the muscle decrease their diameter, which hinders sufficient blood flow, therefore decreasing the gas and substance exchange in the muscle through the blood. This situation produces muscular tiredness due to an accumulation of lactic acid in the muscle.

A similar physiological process occurs in our body when people initiate an exercise routine at the gym, and muscles that had not been used for a certain period are activated. This is the reason a patient wearing any of the trainers complains of muscular soreness on the face and mouth during the first couple weeks of treatment.

When the appliance is taken out of the mouth, the muscles protruding the mandible fall into hyper-contractibility (involuntary and repeated contractions of the muscles), which moves the mandible forward and backward. This explains why at the beginning of treatment (about three to four weeks), patients report that in the morning when they remove the TRAINER (or MYOBRACE) from the mouth, they

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cannot maintain the teeth in maximum contact (maximum intercuspation) and cannot maintain the mandible in a relaxed position. The muscles protruding the mandible are still performing contractions.

This muscular hyper-contractibility produces higher blood flow in the muscles protruding the mandible, and thus the excess of lactic acid accumulated during the period the trainer was in the mouth is removed from the muscles. This increase in blood flow brings to the muscles more undifferentiated cells, which have the ability of differentiating into myoblasts that can produce new muscular fibers in those muscles.

One of the muscles playing an important role in stimulating mandibular growth and development when these kind of functional appliances are used is the lateral pterigoid muscle. This muscle inserts on the mandibular condyle and is in charge of moving the mandibular condyle forward, together with the articular capsule and the interarticular disc at the temporo-mandibular joint, when the mandible protrudes or performs lateral excursions.

As previously explained, there are small movements of the condyle within the glenoid fossa at the temporo-mandibular joint that are interpreted by the patient as discomfort in the morning. It is nothing more than the movement of the mandibular condyle, produced by the hyper-contractibility of the lateral pterigoid muscle raising after the appliance is removed from the mouth.

These forward and backward movements of the mandibular condyle within the glenoid fossa stretch the retro-discal pad (also known as Zenckel's zone) where the blood vessels release nutrients and growth factors that reach the mandibular condyle, stimulating mandibular growth and development through endochondral ossification.

This was reported by Prof. Alexandre Petrovic, who showed through his studies (Petrovic et al., 1991; Stutzmann and Petrovic 1990) how these FMO appliances maintain the mandible over a certain period of time in an edge-to-edge position and how mandibular growth is stimulated by this action. (It is

Fig. 3: Patient is 8 years old. After treatment with a TRAINER Appliance (T4K) for more than 16 months (two bottom photos), the mandible is positioned forward and the inclination of the maxillary incisor teeth improved.

EasyFit Jumper

FORESTADENT introduces a fixed functional orthodontic appliance for the protrusive movement of the mandible with its new EasyFit™ Jumper. This modified Herbst appliance is attached in the maxilla within the molar area (between teeth #5 and #7) and in the mandibular within the premolar area (teeth #3 and #5), similar to the well-known mandibular protrusion hinge by Prof. Dr. Herbst.

The EasyFit Jumper is not attached to bands or splints but placed directly on the archwire of the multibracket appliance. It is fixed in position using special nuts with integrated rectangular tubes that are simply slipped onto the archwire to be fitted, adjusted and clamped using pliers.

The majority of Class II appliances have to be disassembled several times due to the use of spacers, but this is not necessary with the Easy-Fit Jumper, which operates without spacers. Instead, the thread construction in the guide tube ensures smooth adjustment of mandibular advancement.

The key supplied is simply inserted into the hole of the sleeve on the guide tube and turned in the required direction until the planned protrusion is reached. There is no longer the need for time-consuming laboratory procedures or several appointments for individual adjustments of the appliance. All working stages can now be performed directly at chairside in one appointment. The appliance can also be easily reactivated intraorally.

The dorsal angulation bar of the Class II device automatically produces a horizontal movement, which is parallel to the occlusal plane. Applied forces can therefore be channeled to a favorable direction on the square archwire and multibracket appliance.

The intelligent design of the Easy-Fit Jumper also enables left-handed or right-handed activation without having to alter the position of the patient. Furthermore, the unique construction eliminates the risk of accidental aspiration of loose parts.

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important to remember the mandibular condylar cartilage, as all cartilages, does not contain blood vessels and receives its nutrients and growth factors through its surrounding structures.)

This repetitive stimulation every night, maintaining the mandible in an edge-to-edge position, induces new muscular fiber formation in the muscles protruding the mandible and improves the activity in those muscles.

This allows the mandible to be kept in a forward position without muscular tiredness due to lactic acid accumulation. In other words, the mandible is now in a forward position held by the muscles.

On the other hand, this muscular hyper-contractibility, occurring in the muscles protruding the mandible the moment the appliance is removed from the mouth, stimulates endochondral ossification, which leads to more mandibular development. These effects together bring the mandible forward through an increase in the performance of the muscles protruding the mandible and endochondral ossification.

This explains the significant clinical results presented in Figure 3, and those reported in the literature where a significant improvement in the relationship between the maxilla and the mandible was observed in patients Class II, division 1 and 2 when treatment was performed with the TRAINER System Appliances (Quadrelli, et al. 2002; Usumez et al. 2004; Ramirez-Yañez and Faria 2008). OT

Look for Part 3 of this article in the November issue of Ortho Tribune. References will appear at the end of Part 3.

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The TRAINER System in the context of treating malocclusions

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Part three

Another effect reported with the TRAINER System™ Appliances is transverse development of the dental arches. All the Frankel-like appliances, which have a buccal shield in their structure, move the cheeks away from the buccal aspect of the upper and lower posterior teeth. This action produces two effects on the craniomandibular system (CMS).

First, the presence of the buccal shields releases a force produced by the buccinators (muscles of the cheeks) on the buccal aspect of the posterior teeth, which normally is of about 2.7 g/cm^2, but can increase up to 20 g/cm^2 in patients with a digital sucking habit or tongue thrust.

In the same way, these buccal shields in the appliance release excessive force (up to 80 g/cm^2) that can be produced at the corner of the mouth on the cuspid teeth, which can be present in those patients with the same habits. Such a force tends to reduce the inter-canine distance, badly affecting the shape of the dental arches and crowding the dentition (Lindner and Hellsing 1991; Mew 2004).

Second, the presence of the buccal shields in the appliance stretches the buccinators and orbicularis oris (muscles of the lips), creating a tension zone at the area of insertion of those muscles.

As it has been extensively explained in the literature (most orthodontics and cranio-facial growth books), on the tension zone there is bone apposition (Frost 2004). Therefore, by creating a tension zone by stretching the muscles (buccinators and orbicularis) through the buccal shield in the appliance, there is an increase in bone apposition at the maxilla and mandible. The presence of the buccal shield at the anterior area of the mouth encourages the patient to produce a better lip seal, which will be explained later.

Be aware that this effect is higher in the MYOBRACE®. As explained in part two, one of the assets of the MYOBRACE is the inner-core embedded in the buccal shields. This inner-core provides more resistance to the appliance and counteracts the force released by the buccinators and orbicularis muscles when they are hyperactive.

The first effect referred to above permits that the force produced by the tongue on the lingual aspect of the posterior teeth (about 1 g/cm^2) stimulates the development of the dento-alveolar units of those teeth toward buccal. Due to this, there is no force counteracting in an opposite way as it has been neutralized by the presence of the buccal shields. In this way, transverse development is stimulated.

The other effect regarding creating a tension zone at the insertion area stimulates bone apposition at the borders of the mandible and maxilla, thus stimulating further development of the jaws with bone formation that will give more space for tooth alignment.

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Fig. 4: Patient, age 7. In this case, there is also a mandibular advance and an improvement in the inclination of the upper incisors. Furthermore, a significant improvement in lip seal (right side) can be observed in this patient after treatment during 14 months with a TRAINER Appliance (T4K).

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An additional effect to stimulate transverse development of the dental arches with the Trainers is changing the posture of the tongue. When relaxed, the tongue stays in a physiological position (Fig. 4), which is encouraged by the lingual tab located on the upper-lingual side of all the appliances of the TRAINER System, including the MYOBRACE.

It has been scientifically proven that the TRAINER System Appliances stimulate transverse development of the dental arches. A paper published in the Journal of Clinical Pediatric Dentistry (Ramirez-Yañez et al. 2007) shows the results of a study of the effect of the T4K on the dimensions of the dental arches of 60 children with Class II, Div 1. These results show that there is a significant increase in the inter-canine, inter-premolar and inter-molar distances when treatment was performed with the TRAINER Appliance.

This effect is produced by posturing the tongue in a more physiological position and by the buccal shields in the appliance releasing the force produced by the muscles of the cheeks and lips. In other words, the effect with the TRAINER is similar to that reported in patients treated with the function regulator appliance (Frankel R. 1977).

Vertical growth and development

Clinically, the TRAINER System Appliances produce an improvement in the vertical relationship between the upper and lower teeth (overbite) in patients that have either a deep or an open bite. This has been scientifically demonstrated in two studies (Usumez et al. 2004; Ramirez-Yañez et al. 2007) — one where it was reported that patients with deep bite have a significant increase in the vertical dimension (Fig. 5) and another where patients with open bite have a significant reduction in the negative overbite (Fig. 6).

To explain the effect of the TRAINER System Appliances on the vertical development, it is necessary to use concepts from the physiology of the CMS. Furthermore, it is necessary to explain separately how the Trainers work to correct each of these problems, as the same appliance works in a different way when there is a deep bite or an open bite.

Deep bite

When the mouth is closed, the masticatory muscles, particularly the masseters (deep masseter) and temporalis (posterior fibers), increase their activity when the first teeth contact occurs. This is a physiological response that permits a higher force to move the teeth closer and smash any piece of food that may be between them. Patients with a deep bite have stronger muscles closing the mouth (Farella et al. 2003), and some reports have shown that deep-bite patients have more type II fibers in the masseter muscle (Rowlerson et al. 2005), which has been associated with an increase in the average of bite force (Ringqvist 1973).

Fig. 5: Cephalic lateral X-rays of a 5-year-old patient. The left X-ray shows the patient before treatment, the X-ray in the middle shows the patient at the end of treatment, and the X-ray on the right shows the patient one year after treatment with the mandible correctly positioned and with an ideal overbite and overjet for his age. This patient used the TRAINER Appliances for 15 months, starting with the T4I and then switching to the T4K when the first permanent molars erupted.

The presence of the TRAINER in the mouth does not permit tooth contact because of the silicon surface between the upper and lower components of the appliance, which avoids contact between the teeth. As there is no contact between the teeth and maximum intercuspation is not reached, the increase in muscular activity when closing the mouth does not occur, reducing the loading at the teeth and their dento-alveolar units at maximum intercuspation. As the loading at maximum intercuspation is reduced, the dento-alveolar units can develop and teeth can come to that plane given by the occlusal surfaces of the appliance. Thus, an occlusal plane (Spee curve), which is generally

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curved in deep-bite patients, tends to flatten, improving the vertical dimension (Fig. 5).

Open bite

On the other hand, open bite closes when treatment is performed with the appliances of the TRAINER System (Ramirez-Yañez et al. 2007). To understand how these appliances can produce a positive effect when treating open bites, it is necessary to understand the physiology of tongue posture.

First, it is important to remember the tongue, the mandible and the hyoid bone are linked through a muscular system and work as a team.

When the tongue is relaxed, its tip positions on the incisal papilla at the anterior part of the palate, which is its natural position when relaxed. With the tip of the tongue in this position, the dorsum of the tongue runs at the cervical third of the crowns and roots of the upper premolars. The base of the tongue goes downward at the molars, leading to insert at the hyoid bone.

When the tongue is relaxed, the hyoid bone, where the anterior digatric muscle inserts, is positioned approximately between the third and fourth cervical vertebras, and antero-posteriorly, about the middle of the body of the mandible (Rocabado 1983; Tallgren and Solow 1987). The anterior digastric muscle, which is located between the mandibular symphysis and the hyoid bone, plays an important role in the growth and orientation of the mandible (Spyropoulos et al. 2002), as it loads the anterior area of the mandible.

In patients with tongue thrust, the tongue is protruded. Therefore, the tip of the tongue is positioned forward and downward (the dorsum of the tongue comes downward and the base of the tongue moves forward). This causes the hyoid bone to move backward and upward (Ono et al. 1996; Haralabakis 1993), which stretches and increases the muscular activity of the anterior digastric muscle.

Increasing the muscular activity of the anterior digastrics increases the pulling produced by that muscle on the anterior area of the mandible, pulling the mandibular symphysis backward and downward, stimulating a clockwise rotation of the mandible aggravating the open bite.

Fig. 6: Patient, age 8. She had an open bite, which closed after 20 months treatment with a TRAINER Appliance (T4K). Lingual thrust present at the beginning of treatment was corrected, and her occlusion is stable after two years of treatment without using any retention.

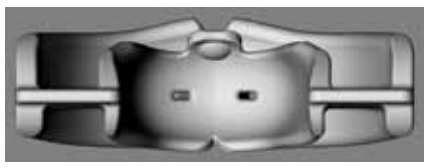

Fig. 7: The lingual tab on the T4K is a key feature of each appliance as it stimulates the tip of the tongue and repositions the tongue in its physiological position.

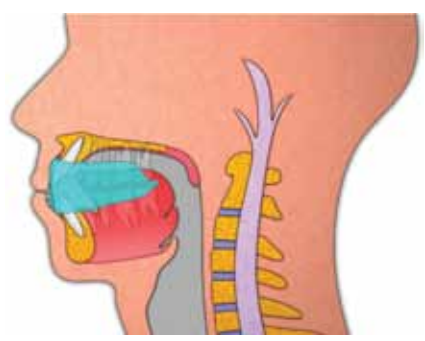

Fig. 8: T4K in place, assisting tongue positioning and lip seal and reducing mentalis activity.

Thus, the effect observed when open bites are treated with the TRAINER System Appliances is produced in part by stimulating re-education of the tongue posture, which is encouraged by the lingual tab located in the upper lingual area of these appliances. When the appliance is in the mouth, the lingual tab stimulates the tip of the tongue (Fig. 7). It does not position between the incisors or even downward, but at the area of the incisal papilla. As previously explained, when the tip of the tongue is at its physiological position, its dorsum and base tend to reposition at their physiological positions as well, with the base descending at the molar area.

In this context, the hyoid bone locates in a better position, decreasing the activity in the anterior digastric muscle. Reducing the pulling at the anterior area of the mandible by the anterior digastric muscle, the mandible is not stimulated to rotate backward and downward anymore, and the muscles elevating the mandible may stimulate a counter-clockwise rotation, which help to close the open bite (Fig. 6).

These significant results when treating open bite patients with the TRAINER System Appliances were explained by Usumez and colleagues (Usumez et al. 2004). They found a significant reduction in the angles FH-MP (frankfort/mandibular plane) and SN-GoGn (sella-nasion/gonion-gnathion), which means the Trainers produce in some way a counter-clockwise rotation of the mandible.

Another effect contributing to the closure of open bites with the Trainers is that the appliance does not allow the tongue to position between the incisors teeth. This allows the teeth that are under-erupted to re-erupt (secondary eruption process) with development of their dento-alveolar units at the anterior area of the mouth. Thus, the appliance of the TRAINER System helps to treat an open bite by re-educating the tongue to position in a more physiological pattern, therefore permitting a counter-clockwise rotation of the mandible as well as stimulating or permitting development at the dento-alveolar units at the incisors.

Lip seal

One of the problems associated with mouth breathing and teeth crowding is unsealed lips. This is caused by a low muscular activity in the lip muscles (orbicularis).

There is an antagonism between the orbicularis and the mentalis muscles; when the lip muscles reduce their activity, the mentalis muscles increase their activity and vice versa (Tosello et al. 1999; Lowe and Takada 1984). In patients who do not maintain a correct lip seal, the mentalis muscles maintain higher activity. So, the muscular activity at the orbicularis is very low or even non-existent.

Lip seal is reached through increasing the activity at the mentalis muscles, which pushes the lower lip up to reach the upper lip, which is generally short because of a lack in development of the upper orbicularis muscle.

The TRAINER System Appliances have some elements on the antero-inferior area of the buccal shield that touch the internal mucosa of the lower lip when the lip is being raised by the mentalis muscles (Fig. 8). When the mucosa of the lower lip is stimulated by any element, the activity in the mentalis muscles is inhibited (Stavridi et al. 1992). Reducing the activity of the mentalis muscles increases the activity of the orbicularis due to the antagonism explained previously (Tosello et al. 1999). This way, development of the lip muscles is stimulated to produce a better and permanent lip seal through the activity of the lip muscles rather than the activity of the mentalis muscles (Fig. 4).

Conclusions

The various appliances of the TRAINER System work similarly, improving the muscular activity of the masticatory and facial muscles as well as re-educating the tongue to sit in a more physiological position when relaxed. By maintaining the mandible in a forward position during a period of approximately 10 hours per day, there is a change of the mandibular posture, which improves the sagittal aspect in those patients with a disto-occlusion.

Through their action on the muscles of the cheeks and lips, the TRAINER System Appliances produce transverse development of the dental arches. Finally, through their action on the muscles closing the mouth and their action on the posture of the tongue, these appliances can improve the vertical aspect in those patients with either deep or open bite.

Thus, it can be concluded that the appliances of the TRAINER System (including the MYOBRACE) are a valid alternative to treat malocclusions, as they improve the sagittal and transverse development of the maxilla and mandible as demonstrated by scientific research. These appliances also improve the muscular activity of the masticatory and facial muscles, as well as the posture of the tongue, as it has been shown in successful cases treated with the Trainers as well as published in the literature.

There is ongoing research with the appliances of the TRAINER System to evaluate their action on the muscular activity of the muscles in the CMS, an action that has been already demonstrated with other functional maxillary orthopedics (FMO) appliances (Stavridi et al. 1992; Sessle et al. 1990).

All changes produced in the mouth and the CMS by the Trainers permit the teeth to have more space and position better in the dental arches — in other words, to have better tooth alignment. The MYO-

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BRACE appliance maintains all the characteristics and elements of the Trainers. Therefore, it can produce the same effects reported by other Trainers as these effects are the result of the elements found in all TRAINER System Appliances.

By stimulating development of the dental arches, there will be more room for the teeth, and the MYOBRACE can guide the teeth to align in a correct position through the tooth channels included in the appliance. This is one of the features that differentiates the MYOBRACE from the other Trainers.

Based on all evidence presented here, it can be stated that the TRAINER System Appliances (including the MYOBRACE) are a viable and scientifically proven alternative to treat those patients who require treatment for malocclusions but who do not want treatment with fixed appliances such as brackets. OT

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