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Myobrace in Treatment of Cl lll Malocclusion

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CERTIFICATION OF THE SUPERVISOR

I certify that this project entitled Myobrace in Treatment of Cl lll Malocclusion in orthodontic was prepared by the fifth-year student **Safa Kareem Chaloob** under my supervision at the College of Dentistry/University of Baghdad in partial fulfillment of the graduation requirements for the bachelor's degree in Dentistry.

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DEDICATION

I'd like to dedicate this project to my beloved **father** and to my beloved **mother** without both I would never make it to this point.

To all my **friends**, thank you for being always there for me with all you love and support.

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Introduction

Positioners have been around for nearly as many years as orthodontics. They are commonly used as retainers, and more recently used as complet orthodontic treatment. Functional appliances also have a long history, with similar attempts to be the complete answer. They all have advantages and disadvantages.

In 1991 the TRAINER System™ was first introduced with the Pre-Orthodontic TRAINER™ (T4K™). This expanded to the T4B™ and the T4A™ for the use with brackets and the permanent dentition. Effectively the system was designed as habit correction with some tooth aligning properties thrown in. It could not be defined as a positioner or a functional appliance, although sharing some features with both its ancestors. Many say, including Graber, that orthodontics has for too long relied upon the fixed brackets as the complete solution. After introduction by Angle 100 years ago, through the technological age, multi banded appliances still have many drawbacks. One of the major ones is relapse, which has plagued the Orthodontic profession **(Quadrelli *et al*., 2002).**

Myobrace System was introduced in 2004. It also consists of various appliances for different age groups and are available in various sizes **(Anastasi G and Dinnella A.2014).** Comprehensive research has shown that mouth breathing, tongue thrusting, reverse swallowing, and thumb sucking, known as incorrect myofunctional habits, are the real causes of malocclusion. These habits limit the child's craniofacial development resulting in orthodon-tic problems. Over the last 20 years, myofunctional research has developed orthodontic appliances to improve the dental and facial development of children from 5 to 15 years of age, using myofunctional orthodontic techniques instead of traditional orthodontics.This technique not only straightens teeth but also treats the causes of crooked teeth and incorrect jaw development **(Sander FG 2001).**

The treatment using Myobrace can avoid the limitations of fixe appliances while achieving better results and improved case stability all with less time.The treatment using Myobrace can avoid the limitations of fixed appliances while achieving better results and improved case stability all with less time **(Roberts WE *et al*., 1997).**

Myobrace appliance can be used as an alternative treatment for malocclusion in children, especially to class III malocclusion . In addition, this tool is also capable of correcting overbite, overjet, crowding of upper and lower anterior teeth, sagittal molar relationships, lip seals, facial asymmetry **(Harun Achmad and Nurul Auliya.2021).**

Aim of the study

The aim of this study to review myobrace appliance and discuss types of myobrace that are used to treatment class lll malocclusion .

CHAPTER ONE

review of the literature

1. Definition of Myobrace

Myobrace is an intraoral appliance system used in orthodontic interception. The mechanism is a combination of preventive and myofunctional therapy. This tool aims to straighten teeth and improve jaw development to prevent jaw backwards. In addition, it allows children to breathe through the nose and rest the tongue in the correct position. myobrace appliance is a prefabricated functional appliance with myofunctional training characteristics, which is used. to correct malocclusion in children who are in the development stag **(Chrysopoulos KN , 2017 ; Achmad, H *et al*., 2022).**

The goals of myobrace treatment are to assist the patient in reaching their full developmental potential and establish nasal breathing from mouth breathing, correctly position the tongue in the upper jaw, swallow properly, lips fused unless eating or speaking, healthy eating habits, correct alignment of teeth and jaw, uninhibited craniofacial development, no extraction or retention, minimal or no use of wires and optimal health is achieved **(Farrell C .2016).**

Myobrace system appliances do not require any impressions, moulding or fitting procedures. it consist of a single block, premoulded to the parabolic shape of the natural arches which contact both the arches, and it is built on an edge-to-edge incisal relation **(Gokce B *et al*,.2016; Aggarwal I *et al*,. 2016).**

The outer layer is made of flexible and soft silicone and it has separate slots for each tooth in dental arch. The inner layer is the hard part made of medical nylon-based material called ‘DynamiCore’. The pre-moulded arch form of inner layer produces arch lengthening by correcting the anterior arch form. In order to determine the appropriate size of the Myobrace for the patient, a sum of the widths of the upper left-right centrals and laterals is calculated using a scale.

After selecting the appropriate size of Myobrace, it is placed in the mouth, and the upper canine position corresponding to the Myobrace tooth slots is checked.

Wearing the Myobracefor a minimum of two hours each day and overnight, provides adequate arch expansion and positive forces to align the anterior dentition **(Gökçe *et al*., 2016).**

1.2 Treatment Actions

Myobrace devices are a three-phase device system designed to correct bad oral habits when treating jaw development problems. They aim to correctly position the tongue in the upper jaw, re-educate the oral musculature and exert force to align the teeth **(Fernandes LFT *et al* ., 2010)**. In phase 1, promotes a correction of habits and adapts easily because it is made of fl exible silicone. It has anterior and posterior air mattresses that improve muscle function in children in primary dentition. Phase 2 offers the development of the dental arch and the correction of habits. It consists of a medium hard material that helps in the enlargement and development of the jaws. The phase3 offers continuous jaw development and occlusal correction. The material it uses is hard polyurethane, which allows excellent alignment of the teeth. The extended tongue positioner completes the correction of the tongue **(Queluz PPD and Gimenz CCM, 2000 ؛ unha Busquet PD *et al*., 2021)**

1.3 Parts Of Myobrace Appliance

The parts of the myobrace appliance **(figure 1)** consist of:

- **a.** Guides For Teeth: as a guide to aligning the teeth in the correct position.
- **b.** Labial and buccal shields: To prevent interposition of lips and cheeks, as well as to provide some strength to misaligned anterior teeth.
- **c.** Tongue tag: Positioned on the retro-incisive papilla, acts as a proprioceptive stimulus to the tip of the tongue, and as a myofunctional trainer to improve tongue posture

d. Tongue Guard: To prevent tongue jostling and interposition, forcing the tongue in its original position, stimulating nasal breathing and preventing bad habits.

e. Lip Bumper: Prevents mentalist muscle hyperactivity

f. DynamiCore : inner layer is the hard part made of medical nylon-based material **(Das UM and Reddy D.2010).**

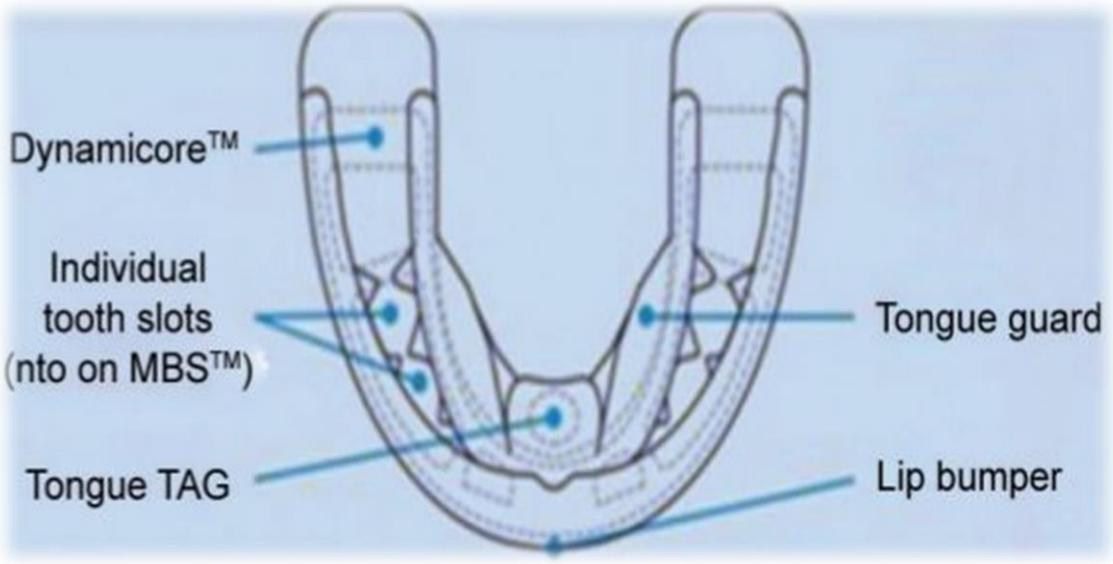

Figure 1. Component of myobrace (Aggarwal I *et al* .,2016).

1.4 Aims Of Treatment Using The Myobrace Appliance

a. Restoring nasal breathing.
b. from mouth breathing.
c. correcting correct tongue posture.
d. correcting correct swallowing.
e. Correcting alignment of teeth and jaw to the correct position.
f. achieve optimal health.
g. unhindered craniofacial development **(Farrel C. 2016؛ Čirgić E *et al*., 2015 ; Cirgic E *et al* ., 2018).**

1.5 Classification Of Myobrace

1.5.1 Myobrace For Juniors (Age 3-6 Years)

Myobrace for Juniors is a three-stage equipment system specially designed to correct bad oral habits while addressing developmental problems of the upper and lower jaw. Myobrace for Juniors is most effective on primary teeth from three to six years of age. This device is specially designed to correct mouth breathing problems, improve tongue position and swallowing pattern, train jaw muscles, change pacifiers, improve natural curve development, early treatment for open bites and cross bites **(Harun Achmad and Nurul Auliy,2021).**

1.5.2 Myobrace For Kids (Age 6-10 Years)

Myobrace for Kids is a three-stage appliance system designed specifically to correct poor oral habits while treating upper and lower jaw development problems. It is most effective after the child's permanent front teeth have come through and before all the permanent teeth have erupted and is available in three sizes **(Ramirez-Yañez GO and Faria P, 2008).**

1.5.3 Myobrace For Teens (10-15 Years)

Myobrace for Teens is a four-stage Myofunctional Orthodontic system designed to replace complex orthodontics with braces and extractions. Its main purpose is to correct oral breathing and poor myofunctional habits that can lead to malocclusion, while the stage 3 (T3) apparatus guides permanent teeth to grow in parallel positions that are in the developmental stage of the tooth. It is specially designed to treat class II malocclusion in the final stages of mixed teeth, class II division 1 and 2, crowding of upper and lower anterior teeth, deep bite, and open bite **(Harun Achmad and Nurul Auliya, 2021).**

1.5.4 Myobrace For Adults (> 15 Years)

Myobrace for Adults is a three-stage equipment system for permanent teeth. For adult patients, all growth has occurred and the tooth is in the most stable position. Improper mouth breathing and swallowing habits have developed over the years and are more difficult to correct. For this reason, outcomes in adults are not as predictable as in children. It is specially designed to treat most malocclusions in adult patients, crowding of upper and lower anterior teeth in mild to moderate cases, treatment of relapsed anterior teeth after fixed orthodontics, moderate cases of Class II division 1 and 2 malocclusion **(Achmad H *et al*.,2020).**

1.5.5 The Myobrace Interceptive Class IIl

Is a three-stage appliance system designed specifically to correct poor oral habits while limiting the excessive lower jaw development problems commonly associated with patients who have class III malocclusion. It is most effective before a child's permanent teeth are coming through and is available in three sizes **(Usumez S *et al.*, 2004).**

1.5.6 Permanent Dentition Class III

Often the opportunity for early treatment of class III malocclusion is missed in the growing phase and it persists into the permanent dentition as well. At that particular time, the myobrace appliance system to correct class III malocclusion is used **(Usumez S *et al.*, 2004).**

1.6 Patient Instructions

- The patient must wear the appliance for 1 to 2 hours each day and overnight while sleeping.
- Regular, everyday use is necessary. If it is not worn every day, it's not going to work.

- At least one myofunctional exercise must be completed every day.
- The patient must learn how to swallow correctly and position the tongue in the correct place in the mouth.
- Patients must keep their mouth closed when not speaking or eating **(Sander FG،2001).**

1.7 Age Selection

The myobrace can be used at any age mixed or permanent dentition but the ideal age is during the eruptive and growth period in the late-mixed dentition. The longer the permanent dentition is in place, the less effective the myobrace will be.Factors such as compliance, the degree of myofunctional correction required and degree of malocclusion all have an influence. The application of the myobrace will always improve dental alignment and treat myofunctional habits at any stage of development and therefore, just as in all orthodontic treatment, individual assessment is necessary. It is best to apply the myobrace in late-mixed dentition cases **(Ramirez-Yañez *et al*.,2005)**

1.8 Patient Selection

There are two components to patient selection - the degree of compliance and the severity of the malocclusion **(Ramirez-Yañez *et al*., 2005).**

1.8.1 Compliance

The most important component is to select motivated patients and parents. The motivation to use the myobrace regularly is the basis in obtaining good results. If the patient is motivated to get a result without the use of brackets, or with very minimal time with braces, and also is well-organized, this will be an ideal starting point for a good result **(Ramirez-Yañez *et al*., 2005).**

1.8.2 Malocclusion

Cases with mild to moderate maloclussion should be selected. The myobrace needs to fit the patient reasonably well from the commencement of treatment otherwise the teeth will not engage the tooth slots of the appliance. For this reason it is important to first evaluate each case by taking records with models and photos prior to setting a treatment plan involving the myobrace Generally, 4 - 6mm of crowding and 4 - 6mm of overjet would be the limit of the myobrace System prior to gaining more experience with more severe cases. More severe malocclusions do not allow the myobrac to engage the teeth and will therefore prevent it from working properly **(Ramirez-Yañez *et al*.,2005).**

1.9 Post-Initial Fitting

After the appliance is fitted , it is important to establish routine reviews to assist in ensuring that treatment is proceeding correctly. Regular reviews once every one to two months are important to ensure that the active treatment is progressing as planned. Soft tissue and dental changes should be seen in the fi rst two to three months. Regular evaluation of treatment progress is important as dental changes can be much more rapid than expected. Progressive models and photos should be taken at three-monthly intervals to record and measure progress. Patients should not be sent away for extended periods of use with the myobrace without close monitoring as the myobrace may “over-treat” to an undesirable result. The patient should be informed that it is essential to have these regular reviews for this reason. Generally, treatment time is between 12 – 18 months **(Ramirez-Yañez *et al*.,2005).**

1.10 Definition And Incidence Of Class III Malocclusion

According to the British Standard Institute (BSI), the class III incisor relationship is defined as one in which the lower incisor edge lies anterior to the cingulum plateau of the upper incisors, with reduced or reversed overjet **(**

British Standards Institute ،1983) in terms of angle classification, a class III malocclusion is one in which the lower molar is mesially positioned relative to the upper molar, with no specifications with regard to the line of occlusion

(Graber TM *et al*., 2005) **.**The prevalence of angle class III malocclusion varies greatly among and within populations (from 1% to more than 10%). The greatest incidence is found among Asian people **(Ideshi Ishii *et al.*, 1987).** Chinese and Malaysian populations show relatively higher prevalence of angle class III malocclusion (15.69% and 16.59%, respectively), while Indian populations show a relatively lower prevalence as compared to other races **(Soh J *et al* ,2005)** in the United States, the prevalence of class III malocclusion is only about 1% of the total population and only 5% of orthodontic patients **(Graber TM *et al*., 2005).**

1.11 Etiology Of Class III Malocclusion

The etiology of class III malocclusion is wide ranging and complex.

1.11.1 Skeletal

A. Genetic Factors

The most well-known example of inheritance is that of the Hapsburg royal family. The distinctive characteristics of this family included a prognathic lower jaw and hence a class III malocclusion. Out of the forty members of the family for whom records were available, thirtythree showed prognathic mandible and consequently a class III malocclusion **(Jacobson A *et al*., 1974).** They concluded that class III characteristics were related to genetic inheritance in offspring and siblings **(Litton SF *et al*., 1970).**

Figure 2 . Mandibular prognathism is best illustrated in the inherited prognathism within the Habsburg dynasty. Charles II of Spain (Hodge GP, 1977).

B. Environmental Factors

A wide range of environmental factors have been suggested to contribute to the development of class III malocclusion.

These include the ectopic eruption of the maxillary central incisor, enlarged tonsils, difficulty with nasal breathing, congenital anatomic defects, diseases of the pituitary gland (as in acromegaly) and the habit of protruding the mandible due to large tongue size or respiratory

problems, which may lead to class III development **(Proffit *et al* ., 2013).**

1.11.2 Soft Tissue

The Soft tissue indeed may act to reduce the severity of CL III, Lower incisor retroclination is adaptive due to soft tissue forces and tongue might procline upper labial segment. Exception in high angle case where there is tongue to lower lip seal and macroglosia that worsen the CL III **(Litton SF, 1970).**

1.11.3 Dental Factors

Rarely Upper labial segment retroclination and lower labial segment proclination. Hypodontia or microdontia in the upper arch Impacted upper teeth **(Litton SF, 1970).**

1.11.4 Habits

Tongue thrusting, mouth breathing, etc (**Litton SF, 1970).**

1.12 Treatment Of Developing Class III Malocclusion

It is very critical to make a decision for developing Class III malocclusion on whether to treat or wait for further growth and dental development. Although a Class III malocclusion may be identified in the developing dentition, a decision needs to be made as to whether it is better to treat it at this stage or wait for further dental development and growth. The timing of early treatment is crucial for a successful outcome. Some studies have reported that treatment should be carried out in patients <10 years of age to enhance the orthopedic effect **Campbell PM , 1983 ;Battagel JM and Orton HS , 1995 ; Baccetti T *et al*., 1998).**

In contrast, some studies found that age of the patient had little influence on treatment response and outcome **(Kapust AJ *et al*., 1998 ; Atalay Z and Tortop T, 2010).** There is no strong evidence to support the notion that early treatment would be beneficial. The main goals of early intervention are to create a more favorable environment for growth and to improve the occlusal relationship: for example, correcting the crossbite and facial esthetics **(Campbell PM , 1983)** Hence, interceptive treatment of Class III malocclusions should be undertaken if it prevents damage to the oral tissues and prevents or significantly reduces the amount, or severity, of future orthodontic and surgical intervention **(Turpin DL , 1981).**

1.13 Goals Of Early Interception Of Class III Malocclusions Are As Follows

help provide a more favorable environment for normal growth

1. achieve as much relative maxillary advancement as possible
2. To improve occlusal relationships
3. To improve facial esthetics for more normal psychosocial development

Treatment timing is debatable as each group has its own benefits and drawbacks. Accurate diagnosis and understanding of the individual growth pattern are very important in determining the proper timing of class III treatment. Optimal treatment timing for facemask therapy is in the deciduous or early mixed dentition period. Delaying appropriate treatment beyond the mixed dentition stage (10 years of age) will limit the effectiveness of orthopaedic correction **(Ngan P ,2006).**

1.14 Characteristics Of Class III Malocclusion

A Class III malocclusion can exist in a variety of combinations of skeletal and dental components within the facial skeleton.The combination of maxillary retrusion and mandibular protrusion was found to be the most frequent combination of skeletal anomalies in North American adults with Class III malocclusion, while maxillary retrusion was more commonly found in juveniles and adolescents. The most consistent characteristics of Class III malocclusions include Angle's Class III molars and canines, proclined maxillary incisors and retroclined mandibular incisors with an edge-to-edge incisor relationship or anterior crossbite **(Baccetti T., 2005).**

1.15 Factors To Be Considered When Planning Treatment (Ngan P, 2005).

1.15.1 Patient's concerns and motivation towards treatment

1.15.2 Severity of skeletal pattern

The severity of the skeletal pattern, both anteroposteriorly and vertically, should be assessed. This is the major determinant of the difficulty and prognosis of orthodontic treatment.

1.15.3 Amount and direction of any future growth

It is important to remember that average growth will tend to result in a worsening of the relationship between the arches, and a significant deterioration can be anticipated if growth is unfavourable. When evaluating the likely direction and extent of facial growth, the patient's age, sex, facial pattern and family history of Class III malocclusions should be taken into consideration.

1.15.4 Can patient achieve edge-to-edge incisor contact?

If the patient can achieve an edge-to-edge incisor contact and then displaces forwards into a reverse overjet, this increases the prognosis for correction of the incisor relationship.

1.15.5 Overbite

In Class III malocclusions a normal or increased overbite is an advantage, as sufficient vertical overlap of the upper incisors with the lower incisors post- treatment is vital for stability.

1.15.6 Amount of dento-alveolar compensation present

If considerable dento-alveolar compensation is already present, trying to increase it further may not be an aesthetic or stable treatment option.

Cephalometrically it has been suggested that an upper incisor angle of 120° to the maxillary plane and a lower incisor angle of 80° to the mandibular plane, are the limits of acceptable compromise

1.15.7 Degree of crowding

Malocclusions crowding occurs more frequently, and to a greater degree, in the upper arch than in the lower. Extractions in the upper arch only should be resisted as this will often lead to a worsening of the incisor relationship. Where upper arch extractions are necessary, it is advisable to extract at least as far forwards in the lower arch**.**

1.16 Treatment of class lll malocclusion by myobrace

1.16.1 Myobrace Interceptive Class III (Mixed Dentition)

allows for early treatment of Class III in the mixed dentition, which is a critical time period that allows habit correction to promote midfacial development and normalise the dental and skeletal relationship. The appliance group can be used from 5 to 12 years of age, but optimum results are achieved between 5 and 8 years. it is three stages of treatment.

Figure 3: Myobrace Interceptive Class III Mixed Dentition

http://goo.gl/bVoQHvod8XAyMBYfx7

1.16.1.1 Stage One (MYOBRACE P-3N)

The i-3N focuses on establishing nasal breathing and myofunctional habit correction. It is soft and flexible to give the best compliance, adapts to any arch form and malocclusion, as well as optimises staying in place at night. Only move to the i-3 when the i-3N is staying in at night and nasal breathing has been established.

1.16.1.2 Stage Two (MYOBRACE I-3)

The i-3 focuses on arch development and continued habit correction. It features a Dynamicore™ that has the Frankel effect, which assists in developing the upper arch form. This helps to correct the Class III malocclusion. Only move to i-3H when the arch orm has improved and tongue resting position and correct swallowing patterns have been established with good dental alignment

1.16.1.3 Stage Three (MYOBRACE I-3H)

The i-3H focuses on completing habit correction, Class III correction, final tooth alignment and retention with its firmer polyurethane construction. This appliance is essential for retention and should be used after treatment for at least 12 months or more to optimise results and stability. The hollow tongue tag facilitates final tongue position directly on the correct spot **(Chris Farrell ، 2016).**

1.16.2 Myobrace Permanent Dentition Class III

Class III presents a non-invasive treatment option for patients in the permanent dentition who have missed the opportunity for Interceptive Class III treatment. Since these patients are no longer growing, correction of the jaw discrepancy is difficult, which is why this range has a particular focus on dental Class III in addition to the improvement of habits. it is three stages of treatment.

Figure 4: Myobrace Interceptive Class lll permenent Dentition

https://images.app.goo.gl/kkMyTYQV5daDiWn9

1.16.2.1 Stage One (MYOBRACE P-3N)

The P-3N focuses on establishing nasal breathing and initial habit correction. It is soft and flexible, giving the best compliance while being adaptive to any arch form and malocclusion. The 3mm offset common to the entire range begins the process of dental Class III correction. Move to the P-3 when the P-3N is staying in overnight and nasal breathing has been established.

1.16.2.2 Stage Two (MYOBRACE P-3)

The P-3 focuses on arch development and continued habit correction. It features a revolutionary Dynamicore inner cage for arch development that further improves habit correction. The 3mm offset common to the entire range continues the process of dental Class III correction. Move to the P-3H when the P-3 has corrected the arch form, occlusion, breathing and myofunctional habits

1.16.2.3 Stage Three (MYOBRACE P-3H)

The P-3H focuses on final alignment of the teeth and retention of the arch form, breathing and myofunctional habits. By this stage of treatment, patients' teeth will be mostly aligned and the P-3H can be used to finalise correction, while the 3mm offset maintains the correct dental relationship. The breathing holes are absent as the patient should be nasal breathing by this stage **(Chris Farrell , 2016).**

Chapter two: disscussion

The results of this review show that Myobrace appliance can be used as an alternative treatment for malocclusion in children, especially to correct class III malocclusion **(Satygo EA et al., 2014 ; Dinkova M , 2015 ; Yanez Go and Flutter J , 2016 ; Wishney M , 2019).** Myobrace, in addition to guiding teeth and aiding proper alignment, increases the effectiveness of orofacial myofunctional therapy: Labial and buccal guards: prevents lip interposition. The Myobrace apparatus is a prefabricated functional apparatus with tooth positioning and myofunctional training characteristics, which is used to correct malocclusions in developing children, in conjunction with myofunctional therapy-via Myobrace **(Saccomanno S *et al*., 2012)** .

The key to this treatment is correcting the position and function of the tongue, obtaining correct nose breathing, and retraining the oral muscles to function correctly. Myobrace appliances effectively train the tongue to position correctly in the upper jaw, retrain oral musculature, and exert light forces to expand the jaws and align the teeth**(Sander FG, 2001**). The Myobrace System Kit has a structural element similar to that of a trainer system, consisting of a tough nylon element, called the Inner-Core or Dynamicore. The manufacturer states that dynamicore helps withstand the forces developed on the teeth by the buccinator and orbicularis muscles allowing correction of misaligned teeth by providing better arch shape. The presence of additional channels in the area of the anterior teeth on the Myobrace System device is claimed to increase its ability to align teeth because it can exert direct force on the teeth. They are available in a variety of sizes for primary, mixed and permanent teeth and for different treatment purposes **(Farrel , 2016 ؛Gokce B and kayaB, 2016 ؛ Nagda SC and Dixit UB, 2019).**

Myobrace Interceptive Class III in Mixed and permenent Dentition are used to treatment class lll malocclusion . Class III malocclusion, in particular, is best treated very early (3-8 years) with the Myobrace Interceptive Class III.

However, often the opportunity for early treatment is missed and the Class III malocclusion persists into the permanent dentition**.(Chris Farrell ،2016).**

Chapter three : conclusions

Myobrace appliance is a new development in orthodontic treatment is suitable for most children in the mixed or permanent dentition with mild to moderate malocclusions. This appliance system offers a new and fresh approach to address the public demand for modern orthodontic treatment options. It available in many sizes and colors for a variety of patients' age groups and treatment needs giving practitioners greater treatment options for a wider variety of patients. Myobrace treatment is often considered a better option because it prevents the problem from happing in the first place and It’s made of flexible silicone that is comfortable to wear and adapts to any arch form. Unlike traditional orthodontics, the aim of Myobrace treatment is not just to have straight front teeth, but also to remove the bad influences on the patients dental and facial development. In children, as a result of improving poor muscular habits patients can experience better facial development. Myobrace is used in interceptive orthodontics, designed for the treatment of malocclusion in pediatric patients particularly classlll malocclusion.

References

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- Achmad H, Djais AI, Syahrir S, Fitri A, Ramadhany YF.(2020) A literature us regarding the use of herbal medicines in pediatric dentistry. International Journal of Pharmaceutical Research , 12,PP. 881-897.
- Achmad H, Djais AI, Syahrir S, Fitria A, Ramadhany YF.(2020) Impact Covid- 19 in pediatric dentistry. A literature review. International Journal of Pharmaceutical Research, 12,p.830-840.
- Achmad H, Djais AJ, Petrenko EG, Larisa V, Putra AP.(2020) 3-d printing as a tool for applying biotechnologies in modern medicine. International Journal of Pharmaceutical Research, 12(4), pp. 3454-3463.
- Achmad H, Djais AI, Jannah M, Huldani, Putra AP.(2020) Antibacterial chitosan of milkfish scales (Chanoschanos) on bacteria porphyromonasgingivalis and agregatibacteractinomycetescommitans. Systematic Reviewa In Pharmacy, 11(6), pp.836-841 .
- Achmad, H., Areni, I.S., Ramadany, S., ...Agustin, R., Ardiansya, R. [2022]. Reduction of excessive overjet in pediatric malocclusion using myofunctional therapy accompanied by electromyography activity evaluation in orofacial muscles. JIDMR, 15(2), 656–668 .
- Aggarwal I, Wadhawan M, Dhir V.(2016) Myobraces: Say No to Traditional Braces. Int J Oral Care Res ،4(1):82-85 .
- Anastasi G, Dinnella A.(2014) Myobrace System: A no-braces approach to malocclusion and a myofunctional therapy device. WebmedCentral Orthodontics ،5(1):WMC004492 .
- Atalay Z, Tortop T. (2010)Dentofacial effects of a modified tandem traction bow appliance. Eur J Orthod ،32(6):655–661.

B

- Baccetti T, Reyes BC, McNamara JA Jr. (2005) Gender differences in class III malocclusion. Angle Orthod ،75(4): 510-20.
- Baccetti T, Tollaro I. A retrospective (1998)comparison of functional appliance treatment of Class III malocclusions in the deciduous and mixed dentitions. Eur J Orthod ,20(3):309–317.
- Battagel JM, Orton HS. (1995)A comparative study of the effects of customized facemask therapy or headgear to the lower arch on the developing Class III face. Eur J Orthod ,17(6):467–482.
- British Standards Institute.(1983) Glossary of Dental Terms, (BS 4492). London: BSI.

C

- Campbell PM. (1983)The dilemma of Class III treatment Early or late? Angle Orthod ,53(3):175–191.

- Čirgić E, Kjellberg H, Hansen K, Lepp M.(2015) Adolescents' experiences of using removable functional appliances. Orthodontics and Craniofacial Research ,18:166 .

- Cirgic E, Kjellberg H, Petzold M, Hansen K.(2018) A cost-minimization analysis of large overjet reduction with two removable functional appliances based on a randomized controlled trial. European Journal of Orthodontics ,40:439 .

- Cunha Busquet PD, Jesus Portelinha DD, Da Costa ML, Cancio de Paula VDA. (2021) How the myobrace appliance works: Advantages and disadvantages ,J Dent Probl Solut 8(1): 019-023.

- Chrysopoulos KN.(2017) Interception of malocclusion in the mixed dentition with prefabricated appliances and orofacial myofunctional therapy.J Dent Health Oral DisordTher ,7(5):343.

D

- Das UM, Reddy D. (2010)Treatment effects produced by preortho-dontic trainer appliance in patients with class II division I malocclusion. Journal of the Indian Society of Pedodontics and Preventive Dentistry ,32 .
- Dinkova M.(2015) Management of Deep Bite in Adults–A Combination of Myofunctional Appliances and Fixed Technique, IJSR 6(5):258.
- Djais AI, Achmad H, Dewiayu D, Sukmana BI, Huldani.(2020) Effect of Combination of Demineralization Freeze Dentin Matrix (DFDDM/0 and Moringaoleifera lam osteoprotegerin (OPG) and receptor activator of nuclear factor kappa Bligand (RANKL) as a marker of bone remodeling. Systematic Reviews in Pharmacy, 11(6), pp.771-779.
- Dr.Chris Farrell BDS. (2016) CEO & Founder of Myofunctional Research Compony .

F

- Farrel C.(2016) The Myobrace® System: Biologically focused treatment innovation-special reports, Australian dental practice :75.

- Farrell C. (2016)Achieving lifelong results with myofunctional treatment – Benefitting patient and dentist , Australasian Dent Prac :72.

- Fernandes LFT, Kochenborger R, Woitchunas FE, Woitchunas DR .(2010) A infl uência da deglutição atípica no padrão craniofacial e na morfologia mandibular ,RFO UPF. 15.

G

- Gokce B, Kaya B.(2016)Current Approaches in Myofunctional Orthodontics. J Musculoskelet Disord Treat ,2(3):1-6 .
- Gokce B, Kaya B.(2016) Current Approaches in Myofunctional Orthodontics. J MusculoskeletDisord Treat ,2(3):2-3.
- Gökçe et al. (2016)J Musculoskelet Disord Treat , 2:022.
- Graber TM, Vanarsdall RL, Vig KWL.(2005) Orthodontics Current Principles and Techniques,4rth ed St Louis: Mosby .565.

H

- Harun Achmad , Nurul Auliya.(2021) Management of Malocclusion in Children Using Myobrace Appliance: A Systematic Review Hasanuddin University Indonesia,2120 - 2136.
- http://goo.gl/bVoQHvod8XAyMBYfx7
- https://images.app.goo.gl/kkMyTYQV5daDiWn9

- Hodge GP.(1977) A medical history of the Spanish Habsburgs. JAMA 238: 1169-74.

I

- Ideshi Ishii, Shuichi Morita, Yutaka Takeuchi, Shinji Nakamura. (1987) Treatment effect of combined maxillary protraction and chincap appliance in severe skeletal Class III cases. A AmJ Orthod Dentofacial Orthop ,October 92(4):304–312..

J

- Jacobson A, Evans WG, Preston CB, Sadowsky PL.(1974) Mandibular prognathism. Am J Orthod ,66:140-71.

K

- Kapust AJ, Sinclair PM, Turley PK.(1998) Cephalometric effects of face mask/expansion therapy in Class III children: a comparison of three age groups. Am J Orthod Dentofacial Orthop ,113(2):204–212.

L

- Litton SF, Ackermann LV, Isaacson RJ, Shapiro BL.(1970)A genetic study of class III malocclusion. Am J Orthod, 58(6):565–577 .

- LoweAA, Tokada K.(1984)Association between anteriortemporal, masseter and orbicularis oris muscle activity and craniofacial morphology in children, Am J Orthod Oct;86 (4):319.

N

- Nagda SC, Dixit UB. (2019)Current Evidence on the Effect of Pre-orthodontic Trainer in the Early Treatment of Malocclusion.IOSR Journal of Dental and Medical Sciences 18(4):23-6.

- Ngan P.(2005) Early timely treatment of Class III malocclusion. Semin Orthod ,11(3):140–145.
- Ngan P. (2006)Early treatment of class III malocclusion: is it worth the burden? Am J Orthod Dentofacial Orthop 129:(4, Suppl)S82–S85.

P

- Proffit, William R, Henry W. Fields, David M. Sarver.(2013) Contemporary orthodontics. 6thed. St. Louis, Mo: Elsevier/Mosby.

Q

- Quadrelli C, Gheorgiu M, Marchetti C, Ghiglione V. (2002) Early myofunctional approach to skeletal Class II. Mondo Orthod
- Queluz DDP, Gimenez CMM. (2000) A síndrome do respirador bucal. Rev.CROMG (Impr.) Jan-Abr 4-9.

R

- Ramirez-Yañez GO, Faria P.(2008) Early treatment of a Class II, division 2 malocclusion with the Trainer for Kids (T4K): a case report.J Clin Pediatr Dent Summer;32(4):325-330.
- Ramirez-Yañez, GO, Junior E, Sidlauskas A, Flutter J, Farell C .(2005) Dimensional changes in the dental arches after using a pre- fabricated functional appliance.
- Roberts WE, Hohlt WF, Arbuckle GR.(1997) The supporting structures and dental adaptation.In McNeill C, editor. Science and practice of occlusion. Quintessenc, p. 79-92 .

S

- Saccomanno S, Antonini G, D'Alatri L, D'Angelantonio M, Fiorita A, et al. (2012)Patients treated with orthodontic-myofunctional therapeutic protocol. Eur J Paediatr Dent, 13:241-243 .

- Sander FG. (2001) Functional processes when wearing the SII appliance during the day. J Orofac Orthop Jul;62(4):264-274.

- Satygo EA., et al.(2014) Electromyographic muscular activity improvement in Class II patients treated with the pre-orthodontic trainer.Journal of Pediatric Dentistry , 381.
- Soh J, Sandham A, Chan YH. (2005)Occlusal status in Asian male adults: Prevalence and ethnic variation. Angle Orthod ,75:814-820.

T

- Turpin DL.(1981) Early Class III treatment. Presented at: 81st Annual Session, American Association of Orthodontists;; San Francisco.

U

- Usumez S, Uysal T, Sari Z, Basciftci FA, KaramanAI, Guray E.(2004). The effects of early pre orthodontic trainer treatment on Class II, division 1 patients. Angle Orthod ,74(5):605-609.

V

- Vierucci F, Francioli D, Giorgetti R . (2010) Modificazione del perimetro d'arcata e avanzamento mandibolare a seguito di trattamento con Myobrace.Il corriere ortodontico, vol. 1,Anno IX; Gennaio-Marzo;.

W

- Wishney M, Darendeliler MA, Dalci O.(2019)Myofunctional therapy and prefabricated functionalappliances: an overview of the history and evidence. Australian Dental Journal;64:135, 137.

Y

- Yanez GO, Flutter J.(2016) Facial Symmetry Improves After Treating Malocclusions with the Myobrace™ System. Ec Dental Science:712.