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The Myobrace Appliance Therapy: Modus Operandi And Beyond: A Case Report

Dr.Chatura Hegde[1], Dr.Debasis Das[2], Dr.Praveena Mittal[3], Dr. Sharmada[4].
[1,2,3,4]*(Department of Orthodontics and Dentofacial Orthopaedics, DayanandaSagar College of Dental Sciences,Bangalore,India)*

Abstract: *Interceptive orthodontics is that phase of orthodontics which is employed to recognize and eliminate the potential irregularities and malposition in the developing dentofacial complex. It aims to treat both dental and skeletal irregularities and also normalize aberrant functional and muscular patterns. Myofunctional appliances form an integral part of the interceptive orthodontics. Myobrace appliance is one such preformed myofunctional orthodontic device which is designed for the treatment of malocclusion in the patient in late mixed dentition. Its mechanism of action is a combination of a myofunctional device and a tooth positioner. We present a case report of a developing malocclusion in late mixed dentition stage which was intercepted successfully using this appliances. An attempt has been made to discuss the modus operandi of the myobrace appliance.*

Keywords: *Functional appliance, Interceptive orthodontics, Orthodontic trainers, Myobrace appliance,Mixed dentition.*

I. Introduction

Early treatment of skeletal and dental malocclusion has become an indispensable part of interceptive orthodontics. The benefits of early interception of malocclusion has been well documented in orthodontic literature.[1-4]Myofunctional appliances form an integral part of interceptive orthodontics as they can normalise aberrant skeletal, dental, muscular and functional patterns.

The **Myobrace Appliance** developed by the myofunctional research $ co. (MRC) has been directed towards improving the dental and facial esthetics of children between 5-15 years of age, instead of using traditional orthodontics.[5] This technique not only aligns teeth (often without braces) but also corrects skeletal mal-relationship as well. It can also act as habit breaking appliance and treat abnormal muscle patterns. A case report has been presented which was treated in late mixed dentition stage with Myobrace appliance. The modus operandi and indications of these appliances has also been discussed to provide a better understanding for its usage.

1.1 Case report

A 10 year old female patient reported to the Department of Orthodontics and Dentofacial Orthopaedics, Dayanandasagar College of dental sciences, Bangalore with the chief complaint of forwardly placed upper front teeth during her late mixed dentition period.

Clinical examination showed a convex profile with retrognathic mandible and increased lower anterior facial height with incompetent lips. (Fig 1a-1c)

Fig 1a Fig 1b Fig 1c

Fig: 1(a-c): Pretreatment extraoral photographs.

Intraoral examination revealed Angle's class I molar relationship bilaterally with a constricted maxillary arch. Crowding in the maxillary and mandibular anterior segments with an overjetof 6 mm and overbite of 4 mm. (Fig 2a-2e)

Fig: 2a

Fig: 2b

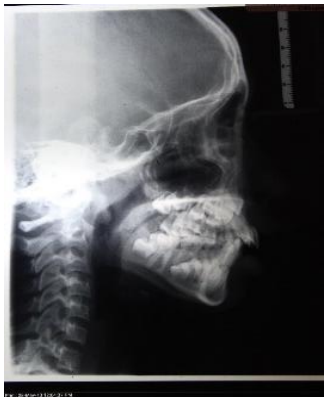
Fig: 2c

Fig: 2d

Fig: 2e

Fig 2(a-e): Pretreatment intraoral photographs.

Pretreatment cephalometric findings as shown in the table 1 indicated a developing skeletal class II on account of retrognathic mandible with increased lower anterior facial height. Upper and lower incisor were placed upright over the basal bone. The skeletal age as assessed by the cervical vertebrae showed that patient was in CVMI stage 3 indicating that 65- 85% of growth was still remaining. (Fig 3a,3b)



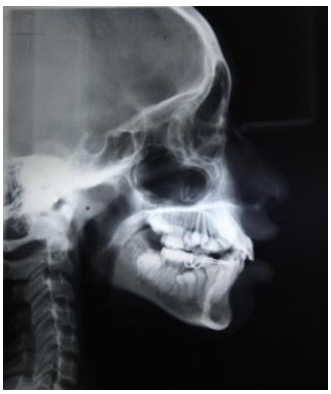


Fig 3a,3b: Lateral cephalogram at the pretreatment and post phase I.

Myobrace appliance was given to enhance the basal bone development, relieve crowding, normalize maxillo-mandibular relationship and control the vertical growth pattern. (Fig 4)

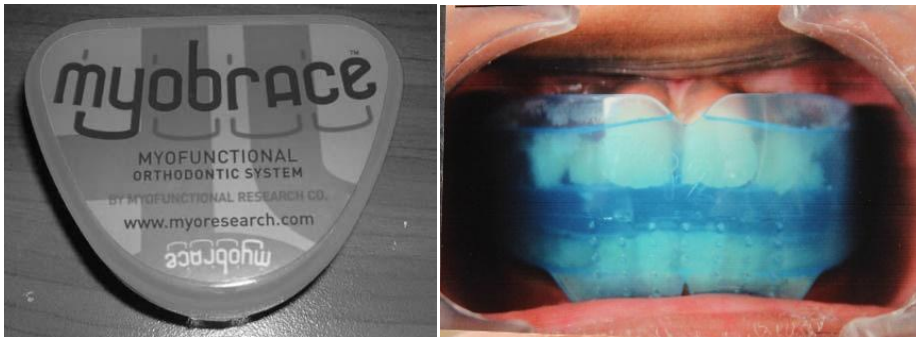


Fig 4: Myobrace appliance

As the patient was in late mixed dentition period, soldered lingual arch was given as space maintainer in the lower arch and Nance palatal button in the upper arch to utilise the leeway space judiciously along with the myobrace appliance.

The extraoral and the intraoral photographs are shown with the myobrace appliance after 12 month period of treatment. (Fig 5, 6) The appliance allowed for arch development which helped to relieve the crowding and also reduced the gumminess of her smile.

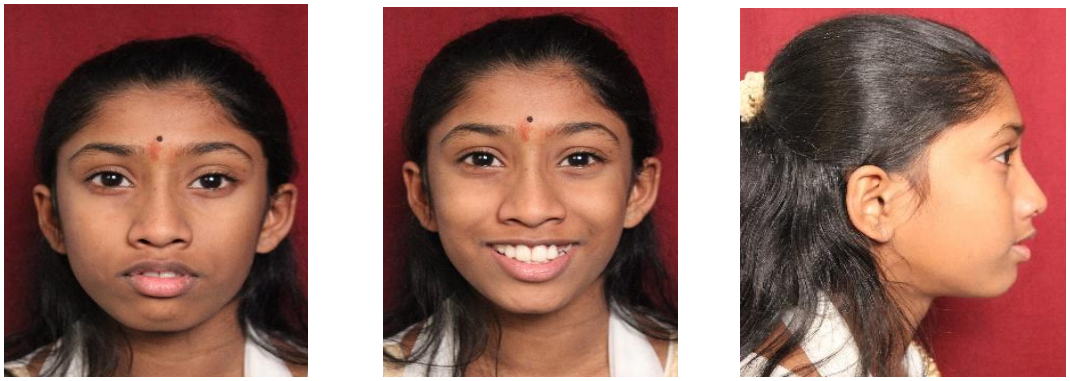


Fig 5a Fig 5b Fig 5c

Fig 5(a-c): post phase I extraoral photographs

Fig 6a Fig 6b Fig 6c

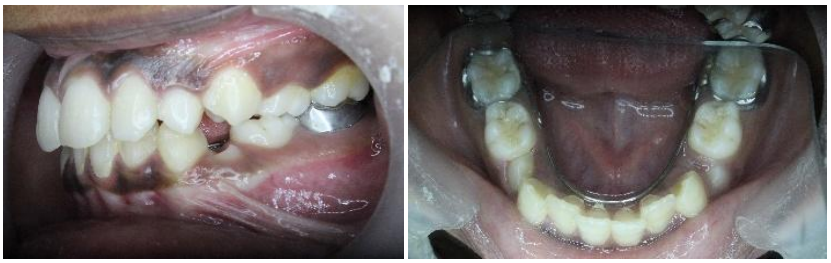


Fig 6d Fig 6e

Fig 6(a-e): post phase I intraoral photographs.

The cephalometric readings of postphase 1 has also been enlisted in table 1. The appliance resulted in improving the sagittal skeletal discrepancy and controlling the vertical growth pattern and in addition to reduce the upper lip protrusion.

Table 1: The cephalometric readings of pre-treatment is enlisted.

Cephalometric findings	Pretreatment	Post phase I
SNA	79 deg	77 deg
SNB	74 deg	75 deg
ANB	5 deg	2 deg
Witts appraisal	AO ahead by BO by 5 mm	BO ahead of AO by 1 mm
Sn- GoGn	38 deg	36 deg
Sn-U1	103 deg	98 deg
LI to MP	93 deg	98 deg
Interincisal angle	121 deg	124 deg
TVL- Upperlip	6mm	4mm
TVL- lowerlip	-4mm	-2mm

II. Discussion

2.1 Modus Operandi of Myobrace Therapy:

Myobrace therapy aims at correcting the functional aberrations of the stomatognathic system namely the position and function of the tongue, abnormal nasal breathing patterns and the tonicity of the oral muscles. The treatment not only corrects skeletal mal-relationship of growing jaw bases but also intercepts habits which cause aberrant facial and dental development.

Thus the appliance therapy has the following goals

- To correct nasal breathing.
- To retrain oral facial musculature.
- To expand the constricted arch forms
- To align teeth.

2.1.1Effect on the Stomatognathic Functions:

With the Myobrace therapy, the tongue gets positioned correctly in the upper jaw. This ensures correct swallowing and breathing patterns. The appliance also retrains the oral musculature which in turn exert light forces that expand the jaws and align the teeth. The Tongue tag, guard and the elevators in the Myobrace Appliance train the tongue to position properly and prevents thumb sucking. The extended lip bumper discourages strong, overactive lip muscles thus improving their tonicity.

2.1.2 Effect on dentition and arch forms:

With the retraining of aberrant oral musculature the resulting forces are directed towards the jaws which help in expanding the arches and alignment of irregular teeth. This is enabled by the Frankel Cage which assists in widening and developing the jaws. The Air spring allows gentle and active stimulation to the growing facial and jaw muscle.

2.2 The treatment is designed for the following stages namely:

1) Primary dentition (junior)
2) Mixed dentition (kids)
3) Developing permanent dentition (teens)
4) Permanent dentition (adults)
5) Mixed dentition (interceptive class III)

2.3 Indication of the Myobrace appliances:

Class II Division 1 malocclusion
Class II Division 2 malocclusion
Deep bite
Open bite
Anterior upper and lower crowding.

Table 2: Myobrace appliance in all stages has a three phase appliance system as recommended by the manufacturer.

Stages	**Primary dentition (Junior)**	**Mixed dentition (Kids)**	**Developing permanent dentition(Teens)**	**Permanent dentition (adults)**	**Mixed dentition Interceptive Class III**
STAGE 1 Habit correction	J1 Flexible appliance with air springs	K1 Flexible appliance with air springs	T1 Flexible appliance with air springs	A1 Flexible appliance	i 3 N
Available sizes	Single size	Three size	Seven sizes	Regular and large size	Three sizes
STAGE 2 Arch development	J2 Medium hardness appliance	K2 DYNAMICORE with Frankel Cage	T2 DYNAMICORE with Frankel Cage	A2 Medium hardness appliance	i 3
Available sizes	Single size	Three size	Single size	Regular and large size	Three sizes
STAGE 3 Tooth alignment and occlusal development	J 3 Rigid appliance with tongue tag	K 3 Rigid appliance for final alignment and retention	T 3 DYNAMICORE with Frankel Cage.	A3 Rigid appliance with tongue tag	i 3 H DYNAMICORE with Frankel Cage.
Available sizes	Single size	Three size	Seven sizes	Regular and large size	
STAGE 4 Retention	Not available	Not available	Rigid appliance with hollow tongue tag	Not available	
Available sizes	--	---	Regular and large size	--	

The current case was treated with K2 which was directed towards arch development. This was brought about by the help of frankel cage based upon force elimination principle. Widening of the upper and lower basal arches prompted the relief of crowding. The tongue tag helped to correct the tongue position. A short phase of fixed orthodontic correction was required to obtain the finer finishing and detailing of occlusion. (Fig 7a-7c)

Fig 7a Fig 7b Fig 7c

Fig 7(a-c): Fixed mechanotherapy intraoral photographs.

III. Conclusion

Myobrace appliance is a removable appliance that combines the rehabilitation of the oral musculature to the properties of a dental positioner, acting on the mouth breathing, atypical swallowing and on the thumb-sucking. It can be used in replacement of other functional appliances: in fact it is a viable alternative for the treatment of malocclusions at an early age, as it acts advancing the mandible and improving dental alignment. Myobrace appliance provides brace free correction of skeletal and dental discrepancy however short phase of fixed orthodontic correction may be necessary in some patient for finishing and detailing.

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