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**Research Paper**

# A Trainer That Trains the Teeth In To Position- A Case Report

Gupta S.S.B[1], Swathi.M[2], M.Sri Ramya[2], Manikanta[2]
*Department of Pedodontics, Lenora Institute of Dental Sciences, Rajanagaram, Rajahmundry, Andhra Pradesh, India*

*[1]PG student, [2] Reader,*
*Corresponding author: Dr. S.Sai Bharadwaja Gupta, Department of Pedodontics and Preventive Dentistry Lenora Institute of Dental Sciences, Rajanagaram*

***Abstract***
*Background:This paper reports acase with developing maxillary premolar crossbite, lower anterior teeth crowding. The case was successfully treated in a short time interval. Clinically significantimprovement in the dimensions of the maxillary and mandibular dental arch forms and sufficient space for the eruption of permanent teeth was observed. Conclusion: Therefore, it can be concluded that that pre-orthodontic trainer is a validtreatment of choice in mixed dentition where transverse expansion is a part of the treatmentplan, as the results obtained are within a shortperiod and have fewer chances ofrelapse because the correction of malocclusion is by elimination of soft tissuedysfunction.*

***Keywords:*** *Crossbite, Malocclusion, Pre-orthodontic trainer.*

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## I. Introduction

The term 'functional appliance' refers to a variety of removable appliances designed to alter the arrangement of various muscle groups that influence the function and position of the mandible to transmit forces to the dentition and the basal bone.[1]Typically, these muscular forces are generated by modifying the mandibularposition in the vertical and sagittal direction, thereby resulting in orthopedic and orthodontic changes.Since early times, usage of these appliances produced skeletal and dentoalveolar changes.[2]Theseappliances make changes via bringing modifications in the neuro-muscular system. A treatment based on only moving teeth would bring relapse until the underlying muscular forces are omitted.[3] Thus, the treatment plan must always aim to eliminate the forces exerted by the soft tissues like lip,cheeks, tongue.[4]Furthermore, the treatment plan in the previous decades included a two-phase system where a functional appliance is used to eliminate the abnormal muscular forces and followed by orthodontic brackets for correction of any relapse.[5] During the last decades, better functional appliances have been developed and have been reported to produce significant changes in oral function andstimulate mandibular growth.[6] The Trainer for Kids (T4K,[R] Myofunctional Research Co, Australia) is a prefabricated appliance aimed at eliminating the muscle forces and repositioning the mandible.[7] By initiating treatment at the patient's mixed dentition age, we can eliminate the orthodontic teeth extractions and orthognathic surgeries in later phases of life. They are also simple to use and economical compared to other orthodontic functional appliances. But the cases need to be carefully selected, and the operator should be well trained in their use.

The purpose of this paper is to present a clinical case where a patient with Angle's class I molar relation with developingpremolar crossbite and crowding of loweranteriorteethsuccessfully treated witha pre-orthodontic trainer in a short period. Thus, this case report substantiates theimportance of proper case selection and utilization of pre-orthodontic trainers as atreatmentof choice in the correction of malocclusionin mixed dentition, in children.

## II. Case Report

An eleven-year-old male child of Asian origin was reported to the Department of Pedodontics, Lenora Institute of Dental Sciences, Rajanagaram, India. The chief complaint of the patient was irregularly placed lower front teeth. The patient did not give any history of harmful oral habits.

**Diagnosis and Etiology**

Extra-oral examination revealed a convex profile and potentially competent lips. On intraoral examination U-shaped upper arch and lower arch were seen (Figure B). Bilateral Angle's class- I molar relation was present with premolar crossbite ontherightside. The patient had an overjet of 3mm andoverbite of 2mm was present (Figure A).Crowding was seen in the lower anteriorteeth (Figure b). Archanalysis revealedthat there was optimum space for both themaxilla and the mandible. Cephalometricanalysis revealed all skeletal and dentalparameters with the normal range.

**Treatment Objectives**

Treatment objective would includecorrecting the premolar crossbite of themaxillary teeth and relieving crowding inthe mandible anterior teeth.The arch expansion was also desired to accommodate the erupting permanent canines, improve the arch forms. Since, dental and muscular problems were involved, and the patient was in growing age, a myofunctional appliance was planned for the patient. Pre-orthodontic blue phasetrainer (Figure C) was suggested to the patient as the child was in the growth phase, and there were no apparent skeletal discrepancies, and he was found to be cooperative. Advantages of amount of cooperation required, and the importance ofregular use for treatment success wereexplained to both patient and parents.Thepatient was asked to wear the appliance for1-2 hours in the day and then overnight. Thepatient was followed up every 15 days forthe first two months and later once everymonth for six months.

**Treatment Results**

Six months later, there was a decrease in lower anterior crowding (Figure D). There was an improvement in the upper and lower arches (Figures D and E). An increase in the inter-canine distance was evident by accommodating the erupting canine in the lower arch, and crossbite correction of premolars is also apparent (Figure F). All these changes were seen just in a span of 6 months. The patient was givena pink phase of trainer to wear for six more months, which acts as a retention appliance. The patient was happy with the treatment results and did not opt for any fixed appliance therapy that was suggested to him for further fine detailing of positions of the teeth.

FigA:occlusion in frontal view

Fig B: Intra oral view of mandibular arch

Fig C: patient wearing blue phaseFig D: Intraoral view of mandible pre-orthodontic trainer post six months of the treatment.

Fig E: Intraoral View of maxilla post six months of the treatment.

Fig F: right side occlusal view with premolar crossbite correction after six months.

## III. Discussion

Since there were no skeletal discrepancies, the trainer was selected as a treatment of choice. Case selection is an essential criterion for the success of the treatment with this appliance. The case presented here required the decrowding of the lower anterior teeth, transverse expansion of the maxillary and the mandibular arches, correction of muscular imbalances, and reduced premolar crossbite. According to model analysis, there was no space deficiency in the maxillary and mandibular arches, but the decrowding of the lower teeth would require space. All these corrections were expected out of the use of a single appliance. The trainer is often unable to offset significant jaw discrepancies such as those at 11 years of age, but the other dental effects of the trainer were still desirable. The parents and the patient were cooperative and followed the instructions correctly. Hence, the patient was put on the pre-orthodontic trainer.

The soft tissue dysfunction was eliminated, and the resting position of the tongue was also corrected. The treatment goals were achieved within half a year, and further treatment became unnecessary.

The trainer acts by three effects thoseare tooth guidance, myofunctional training, and jaw positioning. It aligns the teeth and provides a functional advantage. *Tooth guidance* in a trainer is made from a non-thermoplastic silicone or polyurethane, which has both flexibility and inherent memory. The pre-molded upper and lower labial bows have a similar effect to that of the orthodontic archwire. They are premoulded to the parabolic shape of the natural arches and adapt to any arch size, large or small. The labial bows combined with anterior tooth channels afford a constant force on misaligned anterior teeth to assist in the correction of their position. These trainer components might have caused alignment of teeth,and hence the improvement in arch forms in this clinical case is observed.

*Myofunctional training* effects of the trainer correct the incorrect tongue position and function, tongue thrusting, and oral habits, which cause many malocclusions. The design incorporates a tongue tag for the proprioceptive location of the tongue tip. The raised section on the tag trains the child to place the tongue tip in the correct position with the trainer in place,which also acts as a “reminder” to put the tongue tip correctly without the trainer. The tongue guard prevents a tongue thrust swallow when being in place, which is a "position training" process for the tongue. Corrections of these soft tissue problems have greatly influenced growth, development, and long-term stability. Lip bumpers or mentalis stretchers are incorporated to stretch and deactivate overactive mentalis contraction. Lip bumpers have been shown to gain arch length in mild to moderately crowded cases. This component of the trainer might have helped relieve the crowding in the lower

arch in the present clinical case. The soft tissue problems were also taken care of by the tongue tag, tongue guard, and lip bumpers in the appliance.

The *jaw positioning* is by producing maxillary expansion, accompanied by a spontaneous mandibular response, which increases the dental arch perimeter[8,9] and rotates the mandible posteriorly.[10]

In the present clinical case, the growth of the jaws might have also caused the desired effects. Still, according to results of the study by Ramirez and coworkers, both maxillary and mandibular inter-premolar and inter-molar distances are significantly increased by the T4K. Thus, the arch perimeter is increased and provides more room for tooth alignment. It thus, appears that the prefabricated functional appliance stimulates further transverse development, overlapping that produced by natural growth, which became an asset in treating the present case.Thus, it may be inferred that most of the effects seen were because of the use of the pre-orthodontic trainer.

This paper only reports one patient. Controlled studies with an optimum sample have to be performed to confirm the actions of the T4K on various types of malocclusions. It is difficult to determine the reasons for the quick treatment success because it is given in periods of accelerated growth. But, it can be inferred that the development of jaws and position of teeth can be guided to more favorable positions using this appliance. The operator can be more confident of the results instead of waiting for the growth of the jaws to takeplace which may or may not take place.

## IV. Conclusion

It can be concluded that a pre-orthodontic trainer permits treating several problems that are participating in the malocclusions development and thus permits treating the problem at different points. Case selection must be made with utmost care. The key to the success of this appliance is a *daily use*, and there is no other substitute for the better results of this appliance.

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