

The use of customized trainers in Class II division 1 malocclusion.

Dr. Boukhazani Fouzi, Assistant Professor, Department of human anatomy, Faculty of Medical sciences, Kasdi Merbah University, Ouargla, Algeria.

Corresponding Author: Dr. Boukhazani Fouzi, Assistant Professor, Department of human anatomy, Faculty of Medical sciences, Kasdi Merbah University, Ouargla, Algeria.

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Introduction

The class II division 1 malocclusions, in growing patients, are usually associated to functional disorders. The treatment plan of these malocclusions must include the treatment of oro-facial dysfunctions.

Case Description: This is a case report of 9-year-old girl diagnosed as *Class II division 1 malocclusion*. Functional treatment approach was decided using a customized orthodontic trainer: with the mandible in protruded position and a new occlusion plane.

At the end of this phase of treatment, improvements have been evaluated with lateral cephalograms superimposition between T1 and T2.

Discussion: The customized orthodontic *trainer* allowed a good dento-skeletal result after 18 months application.

Conclusions: The customized orthodontic *trainers* can be a real alternative for early treatment of class II malocclusions with functional patterns.

Keywords: customized trainer, class II division 1 malocclusion, early treatment.

Introduction

The most frequent skeletal problem in class II division 1 malocclusions, in growing patients, is mandibular retrognathia [1][2] associated to functional disorders.

Several interceptions techniques and appliances have been proposed to eliminate functional [3], mechanical and psychological interferences with mandibular growth.

In this context, prefabricated orthodontic trainers are used to unlock mandible growth and to correct functional associated disorders [4].

At the same time, it is well known in orthodontics that customized orthodontic appliances give a better result with higher comfort for the patients [5].

So, in this paper a customization of prefabricated functional appliance is made to allow the class II correction with best stability results.

The aim of this case report is to evaluate the skeletal and dento-alveolar effect of the customized orthodontic trainer in 10 year-old girl diagnosed as class II division 1 malocclusion associated to functional disorders. These treatments effects are evaluated with superimposition of T1 and T2 Cephalograms.

Case description

Diagnosis: A 9-year-old girl was reported to our department by school dentist with main complaint anterior teeth crowding.

At the clinical examination, she presented a convex profile with mouth breathing signs (Figure 1).

Intra-orally, she presented a mixed dentition with early loss of 53, 54, 63, 64, 75 and 85 which caused a “V”

maxillary arch form and a reduced place for the eruption of 13, 14, 23, 24, 35 and 45 (Figure 2).

Furthermore, she presented class II molars relationship, an increased over jet (+6 mm) and a deep overbite (+5.5 mm).

Cephalometrically, the convexity of point A was +4mm and the corpus axis was 54mm suggesting a class II skeletal pattern due to the mandible brachygnathia. The lower incisors inclination to A-Po and extrusion to the occlusion plane was 26° and +5mm respectively (Figure 3). Signs of anterior and posterior discrepancy with high risk of inclusion of the 35 and 45 were noticed on the orthopantomogram.

Treatment plan: Following a comprehensive clinical and data-base analysis, three objectives were planned:

Objective I: Oral functions rehabilitation

Objective II: Maxillary and mandible expansion

Objective III: Achieve skeletal and molar Class I relationship

The VTO (Figure 4) provided to us the predictable results of our strategy.

Appliance choice: *Orthodontic trainers* (Figure 5) are functional appliances which become active through muscular forces and bring dentoalveolar and skeletal changes. They can be used to obtain expansion by the correction of the tongue posture. Some types are used to treat mandibular retrognathia by enhancing mandibular growth; they are constructed in protruded position of the mandible (Activator effect) [6].

But prefabricated trainers do not allow occlusion plan reorientation which is recommended in class II malocclusions associated to retrognathia.

So, the trainer has been customized by eliminating biting plan posterior to the second premolar as showed (Figure 6).

Treatment progress: The patient was referred to an otorhino-laryngologist for evaluation of the upper airway condition. An allergic rhinitis was diagnosed and treated. The patient was instructed to wear the trainer for 14H/24H to achieve the other objectives. The patient compliance was preserved, during the treatment period, by continuous information about treatment goals and short term rewards [7].

Treatment Results: Treatment results (Figure 7) were obtained after 18 months and they were evaluated with superimposition of T1 and T2 cephalograms.

Discussion

The application of the customized orthodontic trainer induced a good dento-skeletal results after 18 months comparing to the objectives visualized (VTO) before the treatment (Figure 8). The same results were obtained in the study of DAS and REDDY in India after 15 months[1] and in the study of USUMEZ and coll in Turkey after 13 months [8].

The literature reported that these results required the patients and the parents compliance [1][8] which was the case in our report.

At the end of the interception, the corpus axis improved from 54mm to 62mm which can be explained by the mandibular growth forward. DAS and REDDY have reported also the decrease of the class II skeletal pattern in the group treated by trainers after 15 months application [1].

The occlusal plan was successfully reoriented thanks to the appliance customization, as shown in the superimpositions. This reorientation is a guarantee for the treatment results long term stability.

The customization allowed, in the other hand, a better patient compliance because it increases the comfort and acceptance of the appliance [9].

Conclusion

The customized orthodontic trainer with a compliant patient induced an interesting treatment results after 18 months application. It can be a real alternative to other techniques and appliances for the correction of the class II division I malocclusions in growing patients specially in low income countries.

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Legends Figure

Figure 1



Figure 2



Figure 3

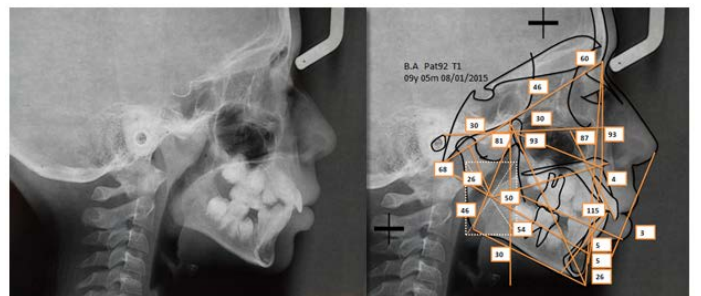


Figure 4

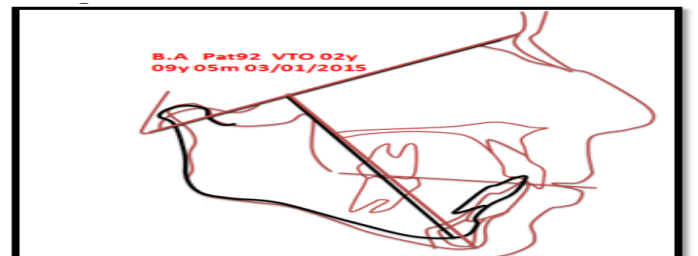


Figure 5



Figure 6

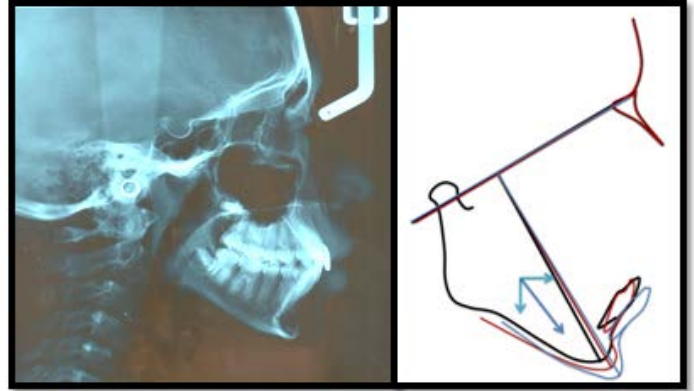
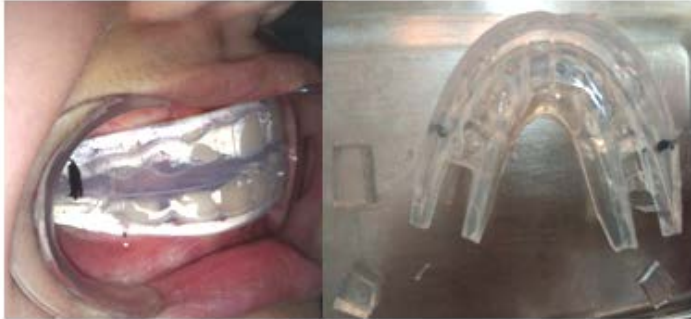


Figure 7

