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# Can the Occlus-o-guide be used in mixed dentition as interceptive therapy of Class II? A literature review

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# Can the Occlus-o-guide be used in mixed dentition as interceptive therapy of Class II? A literature review

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## Abstract

The Occlus-o-guide is an elastodontic Eruption Guide Appliance, which could achieve the ideal occlusion by exploiting the natural forces of growth to obtain harmonic occlusion in a balanced craniofacial context. This study is a literature review and was conducted in order to know if the Occlus-o-guide can be used as an interceptive therapy of Class II malocclusion.

In this review, 4 articles were included. According to these studies, the Occlus-o-guide is a removable, elastodontic appliance which could be used as interceptive therapy of Class II malocclusion and as guide of the eruption of teeth into ideal occlusion. Moreover, this appliance could be used as retainer after the active phase of treatment until the eruption of all permanent canines, premolars, and second molars.

Therefore, the Occlus-o-guide is a safe appliance that allows for simultaneously solving the skeletal, dentoalveolar and dental problems in interceptive therapy phase during mixed dentition and guarantee the long-term efficacy of the obtained results with moderate and constant strength, of correction and stabilisation of overbite and overjet.

## Introduction

The Occlus-o-guide is an Eruption Guidance Appliance, which, according to Bergesen E.O. theory of guided occlusion, could achieve the ideal occlusion by supporting, intercepting and guiding the innumerable variables of times and methods of each element of tooth eruption. In fact, it could exploit the natural forces of growth to obtain harmonic occlusion in a balanced craniofacial context.

The Occlus-o-guide is a monoblock appliance, built on a head-to-head incisal relation, it exists in various series and sizes, depending on the clinical case and the phase of dentition. This device is indicated for patients aged between 6 and 12; it is made of soft elastomeric silicone, a vinyl resin that is called *ElvaxR* which has optimal characteristics of resilience, in fact it is removable, comfortable, safe and simple in

construction and function, and is indicated both in primary and in secondary dentition.

## Materials and Methods

This study was conducted to evaluate if the Occlus-o-guide could be used in clinical practice as interceptive treatment of Class II malocclusion. The review was conducted by consulting *Pubmed* database. The following key word was used: *occlus-o-guide*. Review articles, systematic reviews, case-control studies, randomized studies were included. Articles not in English were excluded.

## Results

According to inclusion and exclusion criteria, 4 articles were included. The Occlus-o-guide is used in these articles in order to evaluate if it could treat Class II malocclusion as interceptive appliance.

Condo' et al. evaluated in two identical twins suffering from the same malocclusion the clinical effectiveness and stability of the functional Class II division 2 interceptive treatment by mandibular back-positioning associated with deep bite at puberty, and to compare skeletal and dento- alveolar changes induced by the application of two different removable appliances: the Twin block of Clark and Occlus-o-guide of Bergesen. Twin-block is a removable functional device in resin consisting of two plates each provided with opposing lateral planes, inclined at 70 degrees to the occlusal plane, which come into contact in the distal region of lower second premolars, resulting in a protruded position of the jaw and allowing the correct mandibular rotation. Moreover, in the literature, the small reports on the use of the Twin Block interceptive treatment of Class II division 2 malocclusion show that this appliance is able to promote growth of the mandible.

The twins included in this study were 11 years and 4 months of age, in mixed dentition, with the same malocclusion: Class II division 2 caused by mandibular retro-positioning associated with deep bite and radiographic presence of Class II division 2 dental relationship on a Class II skeletal basis and

mandibular retro-positioning. Comparing the before and after cephalometric results, both devices were able to promote significant and obvious clinical effects. Moreover, the twin treated with the Occlus-o-guide had: the strengthening of condylar growth in both length and degree of mandibular myo-skeletal progress as well as the establishment of basal and dental Class I; the achievement of optimal intercuspitation for guiding the eruption and maintenance of each individual permanent element in the correct position until the end of the dental exchange; the decrease in the overjet and the stabilization of the overbite within the ideal minimum; the alignment and levelling of the dental arches; progressive improvement of gingival recession present in correspondence to the vestibular surfaces of both central mandibular incisors (due to multifactorial etiology).

The study of Ierardo et al. reports the case of a 5 years old age child affected by Dentinogenesis Imperfecta - a disorder of tooth development, characterized by severe hypomineralization of dentin and altered dentine structure. The patient was treated with elastomeric devices since 5 years to 12 years of age, because of long face and flat profile with a vertical asymmetry, deep-bite, distal step on the right and on the left, deep dental wear. The cephalometric analysis showed: increased overjet, increased overbite and normal divergence.

The patient was treated in two phases: in the first one with the Nite-Guide - an elastodontic device used at night and two hours a day, which is only for primary dentition from 5 to 7 years old kids - while, during the second phase (from 7 years old) she was treated with Occlus-o-guide in order to correct second class of malocclusion and guide the permanent teeth in the right position in the arch and to decrease the overjet and overbite. Thanks to this elastodontic therapy, the patient corrected the Class, deep bite without a severe intervention on surfaces of the teeth.

Lagana' et al. used the Occlus-o-guide in order to correct the dento-skeletal malocclusion, to obtain a correct overbite and overjet, to control the permanent teeth in a good eruption, to improve aesthetical conditions and to maintain clinical results in a 9 years old patient with mixed dentition with dento-skeletal class II malocclusion, deep bite, increased overjet and gummy smile. The face of the patient was symmetric with gummy smile and low retrognathic profile. Clinical examination showed right and left class II molar relationship, no crowding in mandibular arch, increased overjet, severe deep bite, coincident midlines. In the cephalometric analysis, she showed

Class II malocclusion with mandibular, hypodivergency, dental deep bite, increased overjet, proclination of lower incisor and reclination of upper incisor, alteration of profile. The treatment consisted of Occlus-o-guide used during nighttime and two hours a day, which lead to the correction of Class II malocclusion (in 12 months), crowding, gummy smile and deep bite, increasing of overjet, in association with good aesthetic results. These results were stable during time, in fact after 3 years, the patient had correct intercuspitation, no crowding, normal overjet and overbite, right and left canine and molar Class I.

Keski-Nisula et al. investigate the effects of orthodontic treatment in the early mixed dentition with the eruption guidance appliance. In this study, the Authors included patients with at least 1 of the following occlusal characteristics: distal step of  $\hat{A}$  greater than or equal to  $\hat{A}$  1 mm, Class II canine relationship  $\hat{A}$  greater than or equal to 1 mm, crowding, overjet greater than or equal to 3 mm and lack of tooth-to-tooth contact between the incisors, overbite  $\hat{A}$  greater than or equal to 3 mm and lack of tooth-to-tooth contact between the incisors, anterior crossbite, and scissorsbite. The number of children included was 315. Of them, 33 were treated with other appliances, mainly the quad-helix, and they were excluded from the study sample. In 27 cases, the child or the family refused orthodontic treatment. Treatment with an eruption guidance appliance was started in 255 children. During the treatment, 12 children moved to another municipality and could not complete the treatment; their records were excluded from the analysis. Of the remaining 243 children, 167 completed the treatment. There were two times of evaluation: T1 (the time when the treatment started at  $\hat{A}$  the beginning of the mixed dentition period) and T2 (after full eruption of all permanent incisors and first molars), when, the early treatment group entered the retention period, and treatment was started in the control group.

The Authors analyzed the occlusal changes from T1 to T2 of 167 children in the treatment group (85 boys, 82 girls) and 104 children in the control group. The mean ages in both groups were 5.1 years at T1 and 8.4 years at T2. Two or 3 prefabricated eruption guidance appliances (Nite-Guide or Occlus-o-Guide; Ortho-Tain, Winnetka) were used in each patient in the period between T1 and T2 (for 3.3 years), and were worn 1 hour a day and during nighttime, and at T2, all the appliances were used as retainer 2 nights a week, until all permanent canines, premolars, and second molars were fully erupted. The results indicated that orthodontic intervention with the eruption guidance

appliance (included Occlus-o-guide) in the early mixed dentition is an effective treatment modality for malocclusions with Class II or Class II tendency, excess overjet, deepbite, open bite, crowding, anterior crossbite, or buccal crossbite, in fact during the treatment, the erupting permanent incisors and first molars were guided into their correct positions in the dental arches, and intermaxillary relationships in the incisor, canine, and molar segments were largely corrected. This study shows that treatment in the early mixed dentition with the eruption guidance appliance is an effective method to restore normal occlusion and eliminate the need for further orthodontic treatment.

## Conclusions

According to these studies, the Occlus-o-guide is a removable, elastodontic appliance, which could be used as interceptive therapy of Class II malocclusion and as guide of the eruption of teeth into ideal occlusion with moderate and constant strength, of correction and stabilization of overbite and overjet. In fact, they show that it prevents or eventually corrects development of more or less complex malocclusion before the dental exchange is fully completed, gradually guiding the permanent teeth towards a stable relationship in the Class I normal conformant arches with ideal parameters of overjet and overbite so as to be as close as possible to the physiology of occlusal development.

Using the elastodontic treatment for Class II malocclusion produces the following results: increase in mandibular growth and degree of mandibular protrusion, increase in lower anterior and total anterior face height, lingual tipping and retrusion of the maxillary incisors, protrusion of the mandibular incisors, increased mandibular molar mesial drifting and mandibular posterior dento-alveolar height, improvement in maxilla-mandibular and molar relationships, decrease in overjet and overbite and inhibition of the vertical development of the maxillary incisors.

Interceptive treatment of Class II could be done by a careful supervision of the developing dentition and occlusion and a correct diagnosis during mixed dentition. On the other hand, we should consider that Occlus-o-guide is a removable device, so the collaboration of patient and support of parents are essential.

Moreover, this appliance could be used as retainer after the active phase of treatment until the eruption of all permanent canines, premolars, and second molars.

In conclusion, Occlus-o-guide is a safe appliance that allows for simultaneously solving the skeletal, dento-alveolar and dental problems in interceptive therapy phase during mixed dentition and guarantee the long-term efficacy of the obtained results.

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