

*Artigo de Caso Clínico*

## Treatment of deep bite with bite plate: a case report

## Relato de caso de tratamento de sobremordida com placa de mordida

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Plan.

### Abstract

Certain aspects of malocclusion, particularly deep bite, can be related to periodontal pathology and the healthy of temporomandibular joints (TMJ). In orthodontics, deep bite has always been considered as a difficult anomaly to correct, but also as the one most hindering to solving the problems resulting from other associated malpositions. A case report of deep bite and crossed bite of permanent upper left lateral incisor in a Class I malocclusion and permanent dentition illustrates the principles of case management. The reduction of deep bite using bite plate (Equi-Plan) showed quick and short time in permanent dentition (within 4 months). The mesofacial type of the patient favored the fast treatment of the deep bite, in the same way that a dolicofacial type also is favorable because of the facial vertical growth pattern. In contrast, the braquifacial type demands greater time to treat the deep bite.

### Resumo

Determinados aspectos da má oclusão, particularmente a mordida profunda, podem ser relacionados com a saúde do periodonto e das articulações temporomandibulares (ATM). Na ortodontia, a mordida profunda foi considerada sempre como uma anomalia difícil de corrigir, mas também como o primeiro passo para poder prosseguir o tratamento ortodôntico. Um relato de caso de mordida

profunda e mordida cruzada do incisivo lateral esquerdo superior permanente em uma má oclusão em dentição permanente classe I ilustra os princípios de tratamento do caso. A redução da mordida profunda utilizando placa da mordida (Equi-Plan) mostrou-se eficiente em um curto período de tempo (4 meses). O padrão mesofacial do paciente favoreceu o tratamento rápido da mordida profunda, da mesma maneira que um tipo dolicofacial é também propício pelo fato de o padrão de crescimento facial vertical ser mais favorável. No contraste, o tipo braquifacial exige mais tempo na hora de tratar a mordida profunda.

## Introduction

In orthodontics, incisor deep bite has always been considered as a difficult anomaly to correct but also as the one most hindering to solving the problems resulting from other associated malpositions. The concept of unlocking, introduced by the bioprogressive School, proves that the profession has become aware of its importance in any orthodontic treatment plan [2]. Considering how fast the anterior problem is solved once the occlusion is lifted, the bite plate plays an important part in orthodontics treatment. Another advantage of bite plates is in the possible adjunction of an expansion screw also aimed at unlocking the occlusion in transverse direction. Without resolving the deep bite, orthodontics treatment can not proceed.

A case report of deep bite and crossed bite of permanent upper left lateral incisor in a Class I malocclusion and permanent dentition illustrates the principles of case management.

## Case report

A boy, leucoderma, aged 11 years was referred to orthodontic treatment by his dentist due to palatine position of the permanent upper left lateral incisor. The medical and family history was clear and not relevant. The dental history revealed a supernumerary tooth which had been extracted and was positioned forward (labial position) to the tooth 22. At diagnosis, the patient presented deep bite with a Class I facial pattern and Class I malocclusion in the permanent dentition (figure 1). Cephalometric analysis according to Ricketts [8] (figure 1) showed mesofacial type. The mandibular dental midline was deviated to the left side. Treatment was initiated by bite plate (Equi-Plan) [7] (figure 2). The patient was guided to use the appliance all day and remove it only during the meals. The principal objective was correcting the deep bite and allows continuing with the orthodontic treatment. Simultaneously, a palatine spring was applied to stimulate a labial movement of the tooth 22.

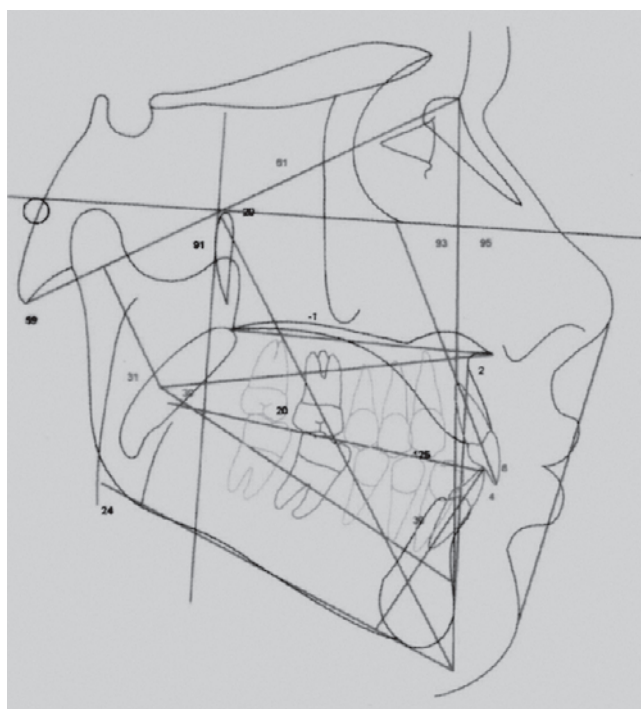


Figure 1 - Ricketts analysis. Data in the image

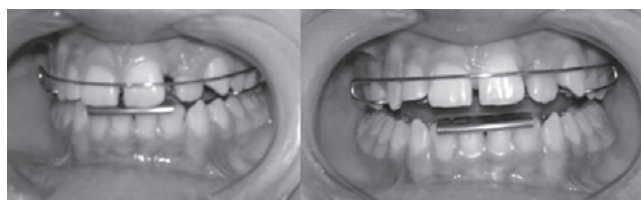


Figure 2 - Patient with bite plate (Equi-Plan)

After 4 months of treatment with bite plate, with monthly accompaniment, the overbite was close of ideal (figure 3) and the patient stopped the use of bite plate. However, the tooth 22 still displayed crossed and thus its orthodontic traction was performed through a segmented arch. Fixed appliance was bonded, and corrective orthodontics was accomplished. Palatine bar for anchorage were used. After 2 months of traction, the tooth 22 displayed in top position (figure 4), therefore, some

months will still be necessary with the segmented arch. The results showed that bite plates can correct deep bite rapidly (within 4 months) and effectively.

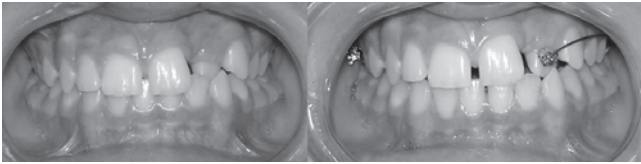


Figure 3 - Initial and final treatment of deep bite



Figure 4 - After 4 months of treatment with bite plate and 2 months with segmented arch. Normal overbite and segmented arch to labial movement of tooth 22

## Discussion

The two common treatment modalities used to reduce deep bite are maxillary incisor intrusion using an intrusion arch and posterior tooth eruption using an anterior bite plate. Both the intrusion arch and bite plate treatment modalities are effective to reduce deep bite over a relatively short period of treatment. The mechanisms of correction are different in the two treatment procedures with the intrusion arch demonstrating significant maxillary incisor intrusion accompanied by a greater decrease in maxillary anterior tooth display (lip to tooth). Bite plate patients exhibit more lower incisor intrusion, significant flaring of the lower incisors and a small increase in the mandibular plane angle. Patients in both the intrusion arch and bite plate treatment modalities may experience flattening of the smile arc during the overbite correction phase of treatment [5].

Certain aspects of malocclusion, particularly deep bite, can be related to periodontal pathology, especially in the presence of poor oral hygiene [6]. Bite plates may be useful as an adjunct to periodontic and orthodontic therapy. They may be used as a diagnostic appliance, to take mobile teeth out of trauma by disarticulating them, to allow teeth to extrude and shallow out associated osseous deformities and to eliminate the superimposed

occlusal trauma that may be caused by the parafunctional habits that can develop during orthodontic tooth movement. The change in vertical position of the dentition and the decrease in overbite with bite plate are primarily due to eruption of the posterior teeth and not intrusion of the lower anterior teeth [4].

Following the conceptions of Planas [7], especially the neuro-occlusal rehabilitation, which include regard for: unilateral alternate mastication, Planas Functional Masticatory Angles (PFMA) and the vertical dimension, the atrophies of maxillary development resulting from reduced mastication, the dominant unilateral mastication syndrome and the original treatments introduced by Planas, this case of deep bite was resolved through the vertical development due to normalization of the occlusive plan using Equi-Plan. The author approves the use of Equi-Plan in adults and child in case of deep bite.

A study compared normal overbite, deep bite and open bite cases with clinically healthy temporomandibular joints (TMJ) regarding the difference between condylar positions in centric relation (CR) and habitual or centric occlusion (CO), condylar paths and radiographic findings of condylar appearance in order to establish normative data. The CR-CO differences were greater in the vertical plane in open bite cases and direction of movements from CR to CO showed great variability. Open bite cases had significantly shorter condylar paths. Radiographic findings exhibited that 23% of the total sample showed evidence of erosion and 83% evidence of flattening of condyles. The erosion rates were higher in the open bite group, but flattening was seen more often in the deep bite group. Results of this study showed that open bite cases show larger vertical CR-CO slides and, shorter protrusion paths than normal and deep overbite cases. The radiographic appearance of condyles in non-patients may also differ significantly according to vertical incisor guidance type. Deep bite cases demonstrated a higher incidence of condylar flattening [1].

Although we did not find TMJ alterations in this case report, the clinician and orthodontists should be paying special attention to the TMJ status of open and deep bite patients. The reduction of deep bite using bite plate (Equi-Plan) showed quick and short time in permanent dentition (within 4 months). The mesofacial type favored the fast treatment of the deep bite, in the same way that a dolico-facial type is also favorable because of the facial vertical growth pattern [3]. In contrast, the brachy-facial type demands greater time to treat the deep bite.

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