



# Open bite correction through molar intrusion with mini-implants

## *Corrección de mordida abierta mediante intrusión de molares con mini-implantes*

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### ABSTRACT

Anterior open bite is a malocclusion in which one or more teeth do not make contact with its antagonists. The malocclusion occurs in the incisors zone and can spread even to posterior teeth. Molar intrusion is one of the main treatment mechanisms, but the methods used to achieve it have been ineffective, mainly because they depend on dental structures resulting in anchorage loss. On the other hand, mini-implants are easy to place, remove and a low-cost alternative to treat anterior open bite. They are an efficient tool to provide anchorage without patient cooperation. This article explains how closure of an anterior open bite was achieved using mini-implants in the maxilla (buccal and palate area with an acrylic button with hooks) and mandible (buccal area). It aims to explain that mini-implants are efficient in causing molar intrusion because they provide more options to correct malocclusions without patient's cooperation.

**Key words:** Mini-implants, mini screws, open bite, molar intrusion, skeletal anchorage.

**Palabras clave:** Mordida abierta, mini-implante, anclaje máximo, intrusión de molares.

### RESUMEN

La mordida abierta anterior es una maloclusión donde uno o más dientes no establecen contacto con sus antagonistas, se presenta en la zona de los incisivos y puede extenderse hasta los molares. La intrusión molar es uno de los mecanismos principales para tratarla, los medios que se han utilizado para este fin han sido poco eficaces, pues se basan en estructuras dentales dando como resultado la pérdida del anclaje. En contraparte, los mini-implantes proporcionan una fácil colocación, remoción y bajo costo para tratar la mordida abierta anterior y son una herramienta más para obtener un anclaje sin la colaboración del paciente. Este artículo explica cómo se logró el cierre de mordida abierta anterior, por medio de mini-implantes en maxila (zona vestibular y palatina con un botón de acrílico con ganchos) y mandíbula (zona vestibular). Se pretende explicar que los mini-implantes son eficientes para el tratamiento de la intrusión molar, porque ofrecen más opciones para la corrección de las maloclusiones sin depender tanto de los pacientes.

### INTRODUCTION

Open bite results from an obvious lack of contact between the upper and lower teeth, in the incisor area or in the posterior segments of the arches.<sup>1</sup>

Vertical dimension control has been a very important factor in open bite treatment and molar intrusion. There are several methods to solve this problem depending on the etiology of the malocclusion<sup>2</sup> whether it is due to genetic factors, unfavorable growth patterns, thumb-sucking, mouth-breathing and atypical swallowing habits, among others. For the correction of less severe problems, there are functional orthopedic appliances such as the high-pull headgear, posterior bite-planes and appliances to correct tongue thrust.<sup>2-4</sup>

The more severe cases usually end up being corrected with combined surgical-orthodontic treatment.

The need to provide absolute anchorage in orthodontics has caused the development and evolution of mini-implants, perfect alternative treatment for anterior open bite correction by molar intrusion. Mini-implants

are pyramidal, self-drilling screws, with a slightly tapered profile which come in different heights, diameters and lengths. They are biocompatible, do not suffer expansion, and are small in order to be placed in any area of the mouth. Mini-implants must withstand orthodontic loads (up to 300 g) in all planes of the space and can be placed and removed with ease under local anesthesia upon completion of the biomechanical therapy.<sup>5-7</sup>

Recently, some case reports of molar intrusion have been published as a method for correcting open bites through titanium plates which are invasive, expensive and require an operating room for their placement.

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In the 2008 Sakai et al. reported a case of open bite corrected with molars intrusion through mini-implants.<sup>8</sup>

The great diversity in mini-implant designs that are available nowadays has facilitated the construction of appliances that can be applied on them. Björn Ludwig suggested placing a lingual button to counteract the force applied to the mini-implants on the buccal thus obtaining a vertical force vector and avoiding buccal crown torque on the molars.<sup>9</sup>

Orthognathic surgery was, until recently, the only alternative to treat severe bite open bites but now there are mini-implants, which have revolutionized orthodontic treatments into more conservative ones, without putting the patient's life at risk.

### CASE REPORT

#### Diagnosis

21-year-old female patient referred to the Orthodontics Clinic of the Postgraduate Studies

and Research Division of the National Autonomous University of Mexico for treatment of moderate upper and lower dental crowding and anterior open bite. Upon medical history, the patient was declared to be healthy. Upon intraoral clinical examination, no pathological data was found nor any pain or TMJ symptoms.

The facial photographs analysis showed a dolichofacial patient, straight profile, straight nose, competent lips, positive smile and the dental midline matched the facial midline. In the intraoral photographs, anterior open bite, posterior cross bite, non-matching upper and lower midlines, Angle molar class I, canine class I, a parabolic arch form and mild upper and lower anterior crowding was observed (*Figures 1 to 3*).

In the panoramic radiograph (*Figure 2*) it was observed: symmetrical condyles and mandibular ramus, maxillary sinuses without any obstruction, leveled alveolar crests, 28 teeth, 2:1 root-crown ratio, root canal treatment in the upper right premolar and a poorly adjusted dental filling on the lower left second molar.



**Figure 1.** Facial and intraoral photographs.

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