



Multi-disciplinary approach for space management of microdontia and upper central incisor retention: a case report

Enfoque multidisciplinario para el manejo de espacios en presencia de microdoncia y retención de un incisivo superior: reporte de un caso

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ABSTRACT

The aim of this article is to present a treatment alternative for microdontia rehabilitation and dental retention. The concept of ideal intercuspation assumes a strict relationship between tooth size and the size of the maxillary and mandibular arches. An impacted maxillary central incisor in a child poses a disturbing esthetic dilemma because of its prominent location. This report presents a 13 year-old patient with microdontia of the upper lateral incisors and retention of the upper right central incisor. Treatment began with the surgical exposure of the retained incisor using light biomechanical traction forces and planning the prosthetic rehabilitation of the lateral incisors by setting up a functional occlusion. Therefore, orthodontics-periodontics-prosthesis interdisciplinary relationship provides an optimal combination for the integral rehabilitation of these patients.

RESUMEN

El objetivo de este estudio es brindar una alternativa de tratamiento en la rehabilitación de la microdoncia y la retención dental. El concepto de una intercuspación ideal implica una relación estricta entre el tamaño dental, el número de órganos dentales y el tamaño de los arcos maxilar y mandibular. Un incisivo central maxilar impactado en un niño, representa un dilema estético complejo debido a su localización prominente. Este reporte presenta un paciente de 13 años de edad con microdoncia de los incisivos laterales superiores y retención del incisivo central superior derecho. El tratamiento inicia con la exposición quirúrgica del incisivo retenido usando fuerzas biomecánicas ligeras para traccionarlo; planeando la rehabilitación protésica de los incisivos laterales al establecer una oclusión funcional. Por lo tanto, la interdisciplina en ortodoncia, periodoncia y prótesis bucal se convierte en una combinación óptima para la rehabilitación integral de estos pacientes.

Key words: Canine traction, periodontal surgery for lingual button placement, ceromer veneers, high-pull headgear, orthodontics, periodontics, prosthetic dentistry, interdiscipline in Odontology.

Palabras clave: Tracción de canino, cirugía periodontal para colocación de botón, carillas de cerómero, arco extraoral de tracción alta, ortodoncia, periodoncia, prótesis bucal, interdisciplina en Odontología.

INTRODUCTION

In human dentition characteristics, complex processes intervene that have a close relationship with the growth and development of the whole craniofacial complex mainly in bones such as the maxilla and the mandible. Dental morphology is determined by environmental and genetic factors which are in a dynamic relationship that may cause single, partial or complete anomalies in dental development.

Dental anomalies affect not only form, size, position, number and developmental time but modify their histologic structure as well.¹ Microdontia is an anomaly in which the affected teeth are smaller than normal.²

Teeth afflicted by size anomalies constitute cases of interest for the professional due to the problems in arch length that they may cause as well as to the facial esthetics challenge they pose; they may cause misalignment and undesirable dental drifts which

support further, more serious problems (i.e. dental retention). Each microdontia case must be diagnosed and assessed according to its particularities.^{3,4} Radiographic imaging constitutes a valuable auxiliary for the identification of growth and development anomalies, since they may be detected by this method before the tooth's eruption. The consulted statistical data has established that microdontia is more common in the incisor area, specifically in lateral incisors, but may appear in any area of the dental arches.⁵

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The microdontia can cause dimensional changes compressing the arch and they could be treated through restorative procedures to preserve aesthetics and occlusion. In this kind of disorders, the prosthetic procedures are the treatment of choice.⁶

The aim of this study was to provide a treatment alternative for microdontia rehabilitation and dental retention. The concept of ideal intercuspation implies a strict relationship between tooth size and number of dental organs and the size of the maxillary and mandibular arches. A maxillary central incisor impaction in a child represents a complex esthetic dilemma due to its prominent location.

This case report presents a 13-year-old male patient with lateral incisor microdontia and upper right central incisor retention. Orthodontic treatment began at the Periodontics clinic with the surgical exposure of the retained incisor. 0.022" Roth appliances were used with the conventional archwire sequence. In order to perform the orthodontic traction of the retained incisor light biomechanical forces were employed (approximation with wire ligature to the main archwire) and attachments to open space (NiTi open coils) to accommodate the microdontic lateral incisors in place. All this was planned for the prosthetic rehabilitation of the lateral incisors while trying to achieve functional occlusion.

Therefore, interdisciplinary treatment between orthodontics, periodontics and prosthetics becomes an optimal combination for the integral rehabilitation of these patients in whom not only esthetics is important but also the stomatognathic system function and leads us to success in dental treatments.

There is little research on microdontia in Orthodontics. However this problem afflicts a vast majority of the world's population. Nevertheless, this case report coincides with the findings of several authors who claim that the most susceptible area for tooth size anomalies of the microdontia kind is the upper anterior area, more specifically, the upper lateral incisors.^{1,7-9}

In the same manner, our results coincide with many more authors who affirm that dental retention is hard to find in the anterior zone, but when diagnosed and treated early, it may be resolved and optimal and satisfying results may be achieved regarding esthetics and occlusal function.¹⁰⁻¹³

CASE REPORT

This case report describes a 13-year-old patient who was referred from the peripheral clinic «Las Águilas UNAM-FO» because he presented microdontia of the upper lateral incisors and retention

of the upper right central incisor. In his past medical history, no relevant data was found and in his non-medical history he declared to be a 5th grade student born in Mexico City.

Upon clinical exploration 21 permanent teeth were observed as well as the clinical absence of the upper right central incisor and microdontia of the upper lateral incisors (*Figure 1*).

In the ortopantomography 28 permanent teeth were observed as well as the tooth germs of the lower third molars. The central incisor retention and the lateral incisor microdontia were confirmed (*Figure 2*). The study models revealed a bilateral molar class II, a non-assessable canine relationship, non-matching dental midlines, a 2 mm overjet and a 3 mm overbite. With the lateral headfilm the cephalometric diagnosis was concluded as a skeletal class II patient with vertical growth tendency (dolichofacial) an upper incisor retroclination.

Orthodontic treatment was initiated with the surgical exposure of the retained incisor at the Periodontics clinic in February of 2010. 0.022" Roth appliances was placed following a conventional archwire sequence (0.014" NiTi, 0.016" NiTi, 0.016" × 0.022" NiTi, 0.017" × 0.025" SS, 0.019" × 0.025" NiTi, 0.019" × 0.025" SS). For the upper incisor orthodontic traction light biomechanical forces were used (approximation to the main archwire with wire ligature and accessory archwires such as Overlay) and attachments for space opening (NiTi open coils) to place the lateral incisors in their correct position.

All of the above was performed planning for the prosthetic rehabilitation of the lateral incisors with ceromer crowns upon establishment of a functional occlusion at the end of treatment. Lastly, removable retainers (Hawley circumferential) would be used 24 hours for a period of six months and 12 hours the following 6 months with check-ups every three months for their adjustment.

Therefore, interdisciplinary treatment between orthodontics, periodontics and prosthetics becomes an optimal combination for the integral rehabilitation of these patients in whom not only esthetics is important but the function of the stomatognathic system as well and which will lead us to success in dental treatments.

MATERIAL AND METHODS

In order to perform the patient's treatment, an interdisciplinary team formed by the specialties of orthodontics, periodontics and prosthodontics was required; each specialty team consisted of a student and a teacher.

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