

Orthodontic management of a patient with severe crowding. Report of a case.

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Abstract

Introduction: Different factors make patients request an orthodontic treatment such as dental crowding, which can be related to the width and length of the dental arch, the diameter of the mesio-distal tooth, and the dental proportions. **Case Report:** A 12-year-old female patient comes to the consultation referring to having "crooked teeth". **Diagnosis:** The extraoral inspection observed facial asymmetry, facial incompetence, concave profile with severe crowding. **Treatment:** The orthodontic treatment to follow was premolar extractions with the use of fixed appliances. **Results:** The objectives proposed in the treatment plan were satisfactorily corrected, such as severe dental crowding. **Conclusion:** The results obtained in the present study highlight that premolar extractions are an adequate option when the patient presents severe crowding with labial incompetence and a class I skeletal pattern.

Keywords: Severe crowding, changes in arch width, removal of premolars

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I. Introduction

One of the reasons why patients start orthodontic treatment is anterior crowding. Many factors are related to anterior dental crowding, including dental arch width and length, mesio-distal tooth diameter, and tooth proportions. (1) However, incisor crowding is not simply a discrepancy in the size of the dental arch. Other variables, such as the direction of mandibular growth, early loss of deciduous molars, oral and perioral musculature, incisor and molar inclination, may be associated with crowding. (2)

The inclination of the lower incisors is another factor that was considered when determining the cause of crowding in the dental arch, it was considered that a vertical or lingual inclination of the lower incisors in the mixed dentition is associated with crowded incisors in the permanent dentition. (3)

Poor relationships of the transverse or vertical arches, such as crowding and local pathologies, are common causes of malocclusions in skeletal Class I patients and are generally managed by extraction or non-extraction treatment in the permanent dentition. There is still controversy in the treatment plan, the question of whether better long-term results are obtained with or without extractions. (4)

It is established that if there is an increase in the width and length of the dental arch during orthodontic treatment, these tend to return to the pre-treatment values in the retention period. (5)

The undocumented criticism of the treatment with extractions is that it results in narrower dental arches compared to treatment without extraction. Non-extraction orthodontic treatments have gained great popularity because extraction treatment promotes narrow smiles, accompanied by dark corridors, concave lower third profiles, and unfavorable mandibular growth. (6)

It is for them that the objective of this clinical case is to point out the need for extractions due to the severe crowding that occurs without compromising the function or aesthetics of the patient.

II. Case Report

A 12-year-old patient comes to the consultation in the company of her mother, referring to having "crooked teeth" without a systematic or allergic history that compromises the case.

Initial extraoral exam: That the extraoral clinical examination shows an apparent facial and brachyfacial asymmetry, concave profile, and labial incompetence. (Fig. 1)



Fig. 1 Initial extraoral photographs

Initial intraoral exam: In the analysis of models and initial intraoral photographs; It was diagnosed as a class III right and left the molar relationship, indeterminate canine relationship, with severe crowding in the upper and lower arch, dental midlines do not coincide with each other, a vertical overbite of 20% and a horizontal overbite of 3mm. (Fig. 2)



Fig. 2 Initial intraoral photographs

Initial radiographic studies: The lateral cephalometric X-ray shows a hyperdivergent skeletal pattern (GoGn/SN 40°) with a class I relationship (ANB 3°) associated with a retrognathic mandible (SNA 79°) with a normal maxilla (SNA 82°). Incisors superior and inferior proclined with prominent osseous symphysis. (Fig. 3)

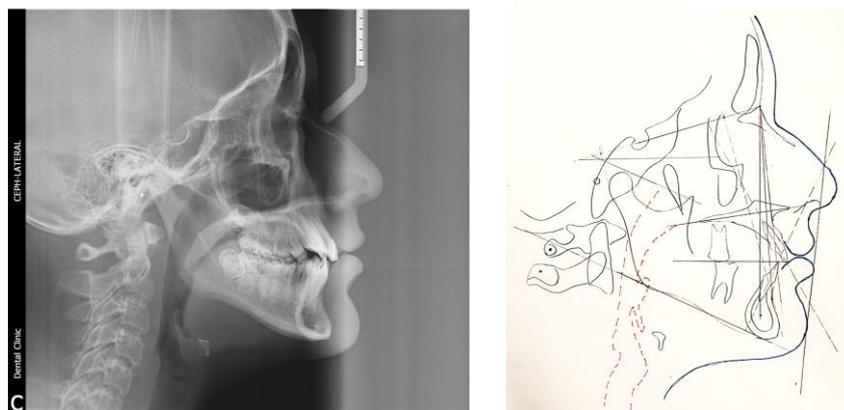


Fig.3 Initial cephalometric radiograph

In the orthopantomography, 28 permanent teeth can be observed in the mouth, third molars in the fifth stage of Nolla, asymmetric condyles in length, and size are captured. (Fig. 4)



Fig.4 Initial orthopantomography

Treatment: It consisted of an orthodontic phase with fixed appliances with a 0.018" slot MBT prescription with maximum anchorage in the inferior achieved with a lingual arch. (Fig.5) To free the crowding, extractions of the upper and lower first premolars were carried out, as well as the sequence of arches starting with a braided arch and posterior to this NiTi 0.014", 0.016", 0.016" x 0.022", 0.017" x 0.025" upper and lower. (Fig.6)



Fig. 5 Initial phase of treatment



Fig. 6 Intermediate phase of treatment

The leveling of the arches with steel arches 0.014", 0.016", 0.016" x 0.022", 0.017" x 0.025", reciprocal closure of the upper arch, achieving correction of the dental midline, obtaining an adequate overbite and overjet, elastic Class II intermaxillary. (Fig.7)



Fig. 7 Final phase of treatment

Final studies: At the end of the orthodontic treatment, the extraoral clinical examination was taken, which indicates that a facial balance was achieved and an adequate profile with lip seal was achieved, dental midline coincides with the facial, consonant smile showing 100% clinical crowns. (Fig. 8)



Fig. 8 final extraoral photographs

In the intraoral photographs the success of the treatment is appreciated, a bilateral molar and canine class I was achieved, with a correct overbite as well as coincident dental midlines, in the right and left intraoral photographs the consolidation of canine and molar classes I can be appreciated bilateral, as well as adequate intercuspation, correction of severe maxillary and mandibular crowding. (Fig.9)



Fig. 9 final intraoral photographs

Results: The objectives proposed in the treatment plan were satisfactorily met by correcting the severe maxillary and mandibular crowding that the patient presented with the MBT prescription appliance. The lateral cephalometric radiograph shows a class II skeletal relationship, hyperdivergence of the patient with the correct inclination of the upper and lower incisors. In the orthopantomography, 28 teeth were present in the mouth, the lower third molars were extracted. (Fig.10)

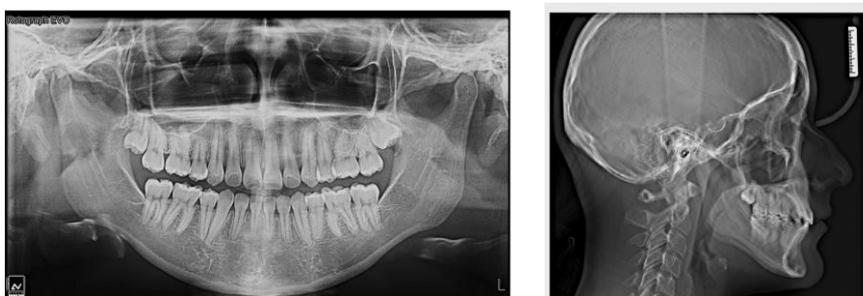


Fig. 10 final radiographs

The patient at the end of orthodontic treatment presents an adequate facial profile, severe maxillary, and mandibular crowding was resolved, bilateral molar and canine class I was obtained, coincident midlines, an appropriate overjet and overbite, adequate root parallelism, canine guides, and incisor. For retention and stability of the treatment, in addition to preserving the intercanine distances, an upper and lower circumferential retainer was placed. (Fig.11)



Fig. 11 Removable retention

III. Discussion

Ikoma et al. Mention that women with Class I occlusion and severe anterior dental crowding showed a significantly wider angle and shorter length at the base of the skull, a smaller sagittal maxillary base, and a hyperdivergent skeletal pattern. These skeletal and dental features and cranial base dysmorphology may be useful as a potential indicator for orthodontic treatment with extractions. (7)

Min-ho et al in their psychological evaluation of adult female orthodontic patient found that patients with severe anterior crowding and/or a very prominent lip profile may have lower self-esteem and quality of life than those with less crowding and/or protrusion. (8)

IV. Conclusions

Los resultados obtenidos en el presente estudio hacen destacar que la realización de extracciones de los premolares son una opción adecuada cuando el paciente presenta apiñamiento es severo con incompetencia labial y un patrón esquelético clase I. La estabilidad del tratamiento llega hacer mas predecible ya que se conservan la distancia intercanina y la posición de los incisivos se encuentran en una posición estable.

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