

## Orthodontic management of class II with ectopic premolar extractions: Case report.

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### Abstract:

**Background:** Ectopic eruption is a disorder in which the teeth erupt in an incorrect position and do not follow their normal course. The etiology can be multifactorial, however, it can present for unknown reasons. Among the alterations that it can produce is dental crowding that can cause dental malpositions that have repercussions in occlusal stability.

**Case Report:** The case of the present article deals with the treatment of a patient with ectopic maxillary second premolars, as well as the orthodontic management for the correction of the malocclusion. The procedure consisted of two phases, with MBT slot 0.018" appliances and extractions of maxillary second premolars.

**Results:** Functional class II molar, class I canine. Vertical and horizontal overbite was improved and occlusal, functional and periodontal stability was achieved.

**Conclusion:** Ectopic eruption of premolars is a rare anomaly that causes irregularities in the arch form, so it is important to be alert in case of a delay in dental eruption or absence of teeth in order to make an accurate diagnosis and early treatment.

**Key Word:** Ectopic, ectopic eruption, class II, migration.

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### I. Introduction

Tooth development begins with the migration of cells from the neural crest into the maxilla and jaw. This procedure involves the ectoderm of the oral cavity, which is responsible for forming the enamel, and the mesoderm that makes the rest of the tooth. Diverse interactions between them will result in a mature tooth. Abnormal tissue that participates in the interaction during development can generally result in an ectopic tooth. [1]

Ectopic eruption is the alteration in the direction of dental eruption and its final position. When the eruption of a dental organ occurs in an adjacent position it is classified as dental transposition and when there is a migration through the midline to the side opposite to the one that should erupt, it is called transmigration. Another associated term is migration, which occurs when the tooth erupts ectopically away from the eruption zone into the alveolar bone. [2]

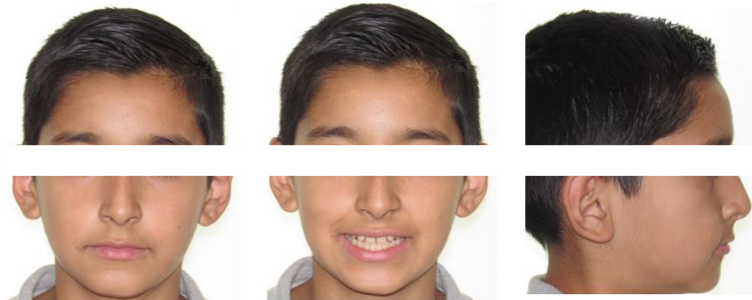
This migration is a result of a localized pathological process, inheritance, extractions of primary teeth, supernumerary teeth, cavities, severe crowding, infections, inadequate orthodontic treatment, hypoplasia of the maxilla or mandible, intrusion of primary teeth or retained primary teeth, among other factors. [3,5] However, it may occur for unknown reasons, without a clear relationship between the displaced permanent tooth and the etiological factors usually cited. [3]

The following case report deals with the management of a patient with ectopically erupted upper second premolars.

### II. Material And Methods: Case Report

A 13 years old male patient with no history of systemic diseases or trauma, attended to Centro Universitario de Posgrado e Investigación en Salud of the Universidad Autónoma de Baja California of Tijuana, where the mother said that the reason for consultation was that her son "has a crooked tooth".

Extraoral analysis shows an ectomorphic, dolichofacial patient with apparent facial symmetry, convex profile, obtuse nasolabial and mentolabial angles (Fig 1).



**Figure 1.**Extraoral photographs

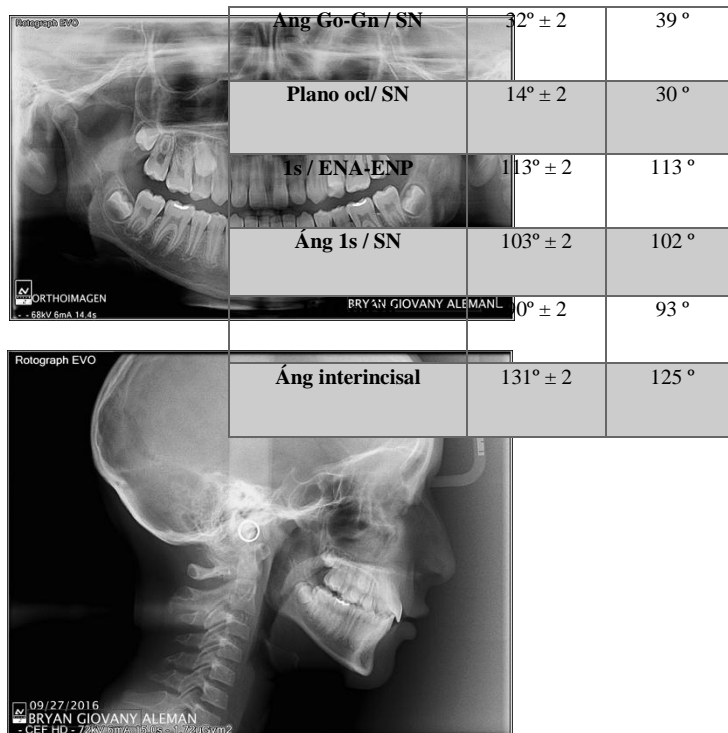
Intraorally we observed that the patient has a normal gingival biotype, with no apparent pathological data. He presents a permanent dentition with bilateral class II molar relation and right and left class I canine relation. Midlines do not coincide with each other, dental malposition, vertical overbite of 30%, horizontal overbite of 2mm, Absence of tooth 4 and 13 ectopic (Fig. 2).



**Figure 2.**Intraoral photographs

The pantomography showed the presence of 27 dental organs in the mouth, retained maxillary second premolar, presence of third molar germs, apparently symmetrical height of branches and condyles, uniform bone density and crown-root ratio of 1:2. Cephalometry showed a skeletal class I with maxillary and mandibular retrusion, vertical growth pattern, upper incisors in norm and proinclined lower incisors. The mandibular body was long in relation to the anterior cranial base (Fig. 3).

NORMA		
SNA	82° ± 2	75 °
SNB	80° ± 2	72 °
ANB	2° ± 2	3 °



**Figure 3.** Panoramic x-ray, lateral x-ray and cephalometric summary

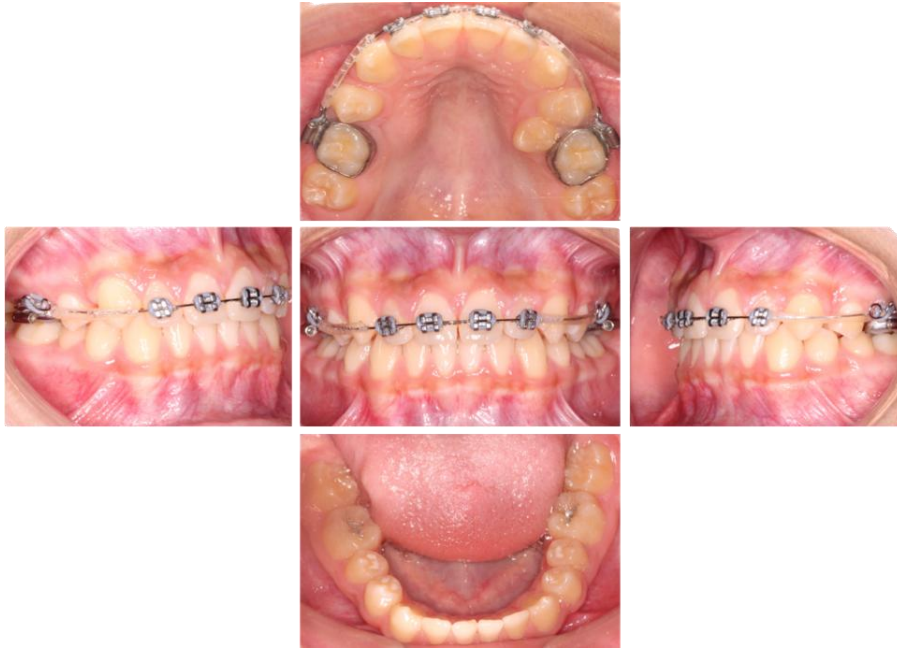
### Treatment Objectives

They were based on achieving a stable occlusion, obtaining a functional class II relationship, harmonizing the arches, improving the horizontal and vertical overbite and maintaining periodontal health.

### Case evolution

The treatment consisted of 2 phases. The first phase consisted of 2x4 fixed appliances (MBT slot 0.18") for 7 months until the closure of the premolar apices. Subsequently, the patient was referred to the oral surgery clinic at the Autonomous University of Baja California for extraction of the maxillary second premolars (Fig4).

In the second phase, the placement of the upper and lower fixed appliances was completed, continuing with the alignment, leveling and arch sequencing phase. Compensatory bending was performed to correct dental malposition and a control panoramic radiograph was taken to assess root parallelism (Fig 5). Subsequently, the spaces were closed with elastomeric chains and finally the appliance was removed (Fig 6). Subsequently, radiographs were taken as well as final extraoral photographs (Fig 7,8).



**Figure 4.**Upper 2x4 fixed appliances MBT slot 0.018”



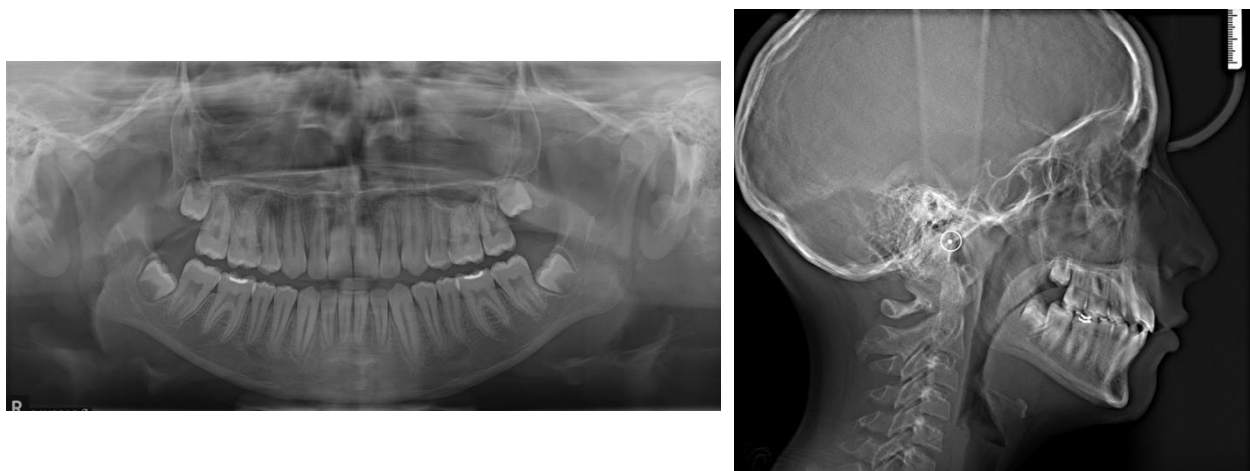
**Figure 5.**Complete upper and lower fixed appliances



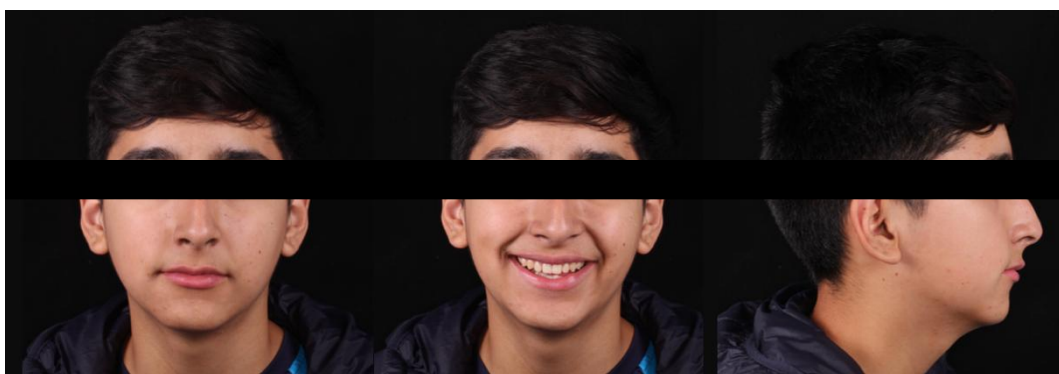
**Figure 6.**Final intraoral photographs

### **III. Results**

It was possible to correct the transposition of premolars by means of extraction, obtaining a bilateral functional class II, improving the horizontal and vertical overbite, generating occlusal and functional stability.



**Figure 7.** Final radiographs



**Figure 8.** Final extraoral photographs

#### **IV. Discussion**

The ectopic position of the premolars usually occurs infrequently or unusually. Andreasen et al, have reported that the prevalence of these impacted teeth is 0.2% to 0.3% taking the third place just after the third molars and maxillary canines. [4] Other studies indicate that this type of case is seen in 0.5% to 0.9% of the total population, with a higher recurrence in the male sex, as in the case presented above. In addition, the problem usually manifests itself due to an alteration during dental eruption and occupies a final position outside the anatomical limits. [2]

The etiology of ectopic teeth can have a multifactorial origin, where some authors expose different predisposing factors. It has been related to systemic elements where we can find a variety of syndromes that are characterized by the involvement of various dental organs, as well as local factors have been suggested as the angulation of the teeth, size and abnormal anatomical shape, as well as crowding. [5,6]

Ismail M. et al. mention that choosing the ideal treatment for patients with ectopic teeth can be a challenge for the dentist. Different treatment approaches have been reported for impaction in general, however there is little literature on premolars specifically. [4] The patient had an ectopic right upper premolar and an impacted left upper premolar, which required a correct and detailed diagnosis to establish an ideal and timely treatment for the success of the case.

Among the therapeutic alternatives, we can find interceptive orthodontics, surgical exposure with orthodontic intervention, autotransplantation and extraction, which will depend on the position of the impacted tooth and the relationship it has with the adjacent teeth. [7] It is also important to know the patient's age, whether he/she presents symptoms, the size of the dental organ, its location and the space present in the arch if it is necessary to position the tooth in the arch. [2] In the present case, the patient arrived with permanent dentition, so preventive treatment alternatives were limited and both upper premolars were extracted.

In mixed dentitions it is common to find maxillary and mandibular second premolars erupted in a displaced position towards palatal or lingual respectively, which can lead to root resorption of adjacent teeth, so the extraction of these teeth may be the appropriate treatment. Waterhouse et al. mentioned in their study that the extraction of the impacted maxillary first premolar prevents root resorption of the first molar when impaction is first observed. [8] In this case, the treatment was successfully completed without root resorption in adjacent teeth.

It has also been mentioned that adequate esthetics and optimal function are achieved by moving the transposed teeth into their correct position in the arch. However, our clinical case demonstrates the limitation of placing the ectopic dental organs in the arch due to the lack of space and crowding presented by the patient. Therefore, the indicated therapeutic option was the extraction of the maxillary second premolars. [9,10]

#### **V. Conclusion**

Ectopic eruption of premolars is a rare anomaly that can cause multiple problems including irregularities in the shape of the arch. Therefore it is important to be alert in case of observing a delay in tooth eruption or absence of teeth in order to make an accurate diagnosis and timely treatment to avoid complications in the future.

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