

## CONSIDERATIONS REGARDING ORTHODONTIC TREATMENT IN ADULT PATIENTS WITH EXTRACTION OF ECTOPIC CANINES

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### Summary (Abstract)

Orthodontic treatment aims to give patients a more satisfactory dental and facial appearance and to improve the functions of the dentomaxillary apparatus. Orthodontic treatment is influenced by the pattern of facial growth, the development of dentition and occlusion, and the severity of the dento-maxillary abnormality. Patients often require orthodontic treatment for dental crowding, especially in the anterior dental area. Following the clinical examination and study models, the radiological examination (orthopantomogram and cephalography) and after establishing the orthodontic diagnosis and prognosis, the orthodontist may recommend performing dental extractions to achieve dental alignment and stable occlusal relationships, with maximum intercuspitation. Depending on the clinical situation and the severity of the dento-maxillary abnormality, is recommended extraction of the premolars, the wisdom molars, the teeth affected by carious lesions, with large and irreparable coronary destruction. The indication of definitive canine extraction should be avoided in view of their coronadicular anatomy and the importance of facial aesthetics and mandibular functional movements.

In this article we will present orthodontic treatment in one case of adult patient who have requested dental alignment and occlusal balancing after definitive canine extractions. The extractions were carried out in childhood by dentists, due to the canine vestibular ectopic position, the dental crowding, without subsequent orthodontic treatment.

Key words: orthodontic treatment in adults, extraction of ectopic canines, dental alignment

### Introduction

Extractions of the teeth are made to provide space for the alignment of crowded teeth, for the retraction of protruded teeth or camouflaging the skeletal class II and class III malocclusions. Evaluation of diagnostic elements for extraction will be done taking into account by genetic factors, environmental influences, facial appearance and growth, model analysis and cephalometric variables(1).

Facial appearance is important for extraction or non-extraction orthodontic therapy because the soft tissue profile can be affected to the detriment of the patient. In malocclusions with skeletal discrepancies is very important to establish if the patient is still undergoing significant facial growth; if the case can be corrected by growth redirection, the orthodontist can treat it without extractions(2,3).

Model analysis establishes the degree of discrepancy between bone and tooth

structure, the symmetry of the dental arches, the depth of the curve of Spee, the Bolton discrepancy.

Cephalometric variables sets the vertical facial proportions, facial paternal growth, direction and growth potential of the mandible, the facial rotation, the position of lower incisors. Depending on the variables obtained by various measurements, is established the skeletal diagnosis, the prognosis of dental abnormalities, the orthodontic treatment planning and dental extraction decision. For example, treatment geared toward achieving facial balance is more likely to extract in skeletal open bite and not extract in cases with skeletal deep bite(2,4).

The choice of individual teeth extraction depends on the existing dental crowding, the odontal and periodontal status or the ectopic position of the tooth / teeth proposed for extraction, the pattern of individual growth and the harmonious soft-tissue profile.

For example, extraction of maxillary incisors for orthodontic treatment are indicated when the incisors are affected by grossly carious or are malformed that cannot be restored, are suffered trauma or irreparable damage, are impacted unfavorable, in case of buccally or lingually blocked out lateral incisor with good contact between central incisor and canine or on congenitally missing one of lateral incisor so opposite incisor may require extraction to maintain arch symmetry(2,3).

The extraction of mandibular incisors are indicated on permanent dentition, with Class I molar relationship, with little or no

crowding in the maxillary arch, existing Bolton discrepancy and minimal-to-moderate overbite. Extraction of a lateral incisor is generally preferred because it is less visible from the front; it is advisable to extract the mandible incisors with periodontal conditions, with gingival recession, and with any restorations, including endodontic treatment(2,5).

Extraction of first premolars is most often indicated in cases of dental crowding, because increase anchorage, with maximum lip retraction, assure better contact between the canines and second premolars and they are nearer to anterior crowding(1,6).

The first molars are indicated to extract when are extensively carious or hypoplastic, with heavily filled and apical pathology or root canal treated and the premolars are perfectly healthy and in cases with crowding at the distal part of the arches and wisdom teeth reasonably positioned and high maxillary/mandibular planes angle with anterior open bite cases(3,4).

The second molars extractions are made when are severely carious, ectopically erupted, or severely rotated, in cases with skeletal Class I malocclusions with arch length discrepancy in the distal part of the arch or with mild anterior crowding and in Class II "skeletal" cases with only mild crowding of the mandibular arch. The advantages of second molars extractions are: facilitation of first molar distal movement, disimpaction of third molars an faster eruption of them and prevention of "late" incisor imbrications (1,2).

Permanent canines can be extracted in the following situations: when they are destroyed by caries, when are horizontally

impacted, without the possibility of surgical-orthodontic recovery, when presentig follicular cysts, anklosed, with internal or external root resorption(3,7). The other indications for definitive canine extraction are: when they are ectopic (vestibular or palatal), without space for alignment, away from the place of alignment, and when the orthodontic movements and forces during orthodontic treatment necessary for the recovery of the canines can cause the root resorption of the neighboring teeth with their avulsion. As far as possible, the removal of the definitive canines should be avoided because is one of the most solid tooth in the mouth and it can bear significant forces. Its root is one of the longest among all the teeth, including molars. Canines have a particular functional role; they guide the mandibular movements, and protects the other teeth by preventing them from being in contact with each other (4,7).

Canines have a significant esthetic role, because they are in the “corner” of the mouth and they have a particular shape that ensures the transition between the anterior and posterior teeth.

In cases with cuspids extractions or if they are malpositioned in the dental arches, other teeth will have to play the role of the canines and this may cause short or long-term problems (wears, periodontal recessions, jaw joints problems, etc.)(1).

Taking into account the above we will present orthodontic treatment in one case of adult patient who have requested dental alignment and occlusal balancing after extractions of definitive canine . The extractions were carried out in childhood by

dentists, dued to the canine vestibular ectopic position, the dental crowding, without subsequent orthodontic treatment.

#### Clinical case presentation

Patient L.G., female, 30 years, asked for consultation and orthodontic treatment for alignment the bimaxillary dental crowding, after consulting another orthodontist.

The exo-oral clinical examination noted:

- round and symetric facies
- the equal proportion of the figure floors
- normal convex profile
- deviation to the right of the jaw interliner line relative to the facial midline during the smile.

The intraoral clinical examination revealed (figure 1):

- odontal lesions treated with composite fillings at 14 and 46
- central maxillary incisors with atypical shape, in the trapezium, with an incisive sum of 34 mm
- the absence of 13 and 33
- bimaxillary dental crowding about 4 mm, with rotations at 23 and mandibular incisors
- the presence of the four wisdom teeth
- lack of correspondence between median and inter-incisive lines
- periodontal recession at the level of 34, due to occlusal trauma, the mandibular premolar performing mandibular propulsion and left side lateral guidance
- neutral bilateral molars relations
- anterior overbite about 1/2
- the curve of Spee deep, on both

side



Fig. 1 Appearance of dental arches at the beginning of orthodontic treatment

The patient said that around 13 years of age, extraction of canines 13 and 33 was performed on request due to vestibular ectopic eruption without space for alignment. The extractions were performed by a dentist without asking for orthodontic consultation, considering that extracting ectopic canines will resolve the existing dental crowding.

The examination of the orthopantomogram reveals (figure 2):

- endodontic treatment at the 14
- the absence of 13 and 33
- the mandibular anterior rotation (upward ascending ramus, mandibular condyles with anterior orientation)



Fig.2 The orthopantomogram of the L.G. patient at the beginning of orthodontic treatment

The examination of the model casts revealed a maxillary dental crowding of 3 mm and a mandibular of 6 mm. The proposed orthodontic treatment plan was:

- the orthodontic extraction of 44 and 24, for occlusal balancing and obtaining the correspondence of the median and inter-incisive lines. The patient initially refused any extraction, finally accepting the extraction of 44.
- leveling and alignment of dental arches
- closure of the mandible extraction space
- leveling the Spee curve, achieving the 1/3 anterior overbite.

The treatment was performed with a fixed metallic orthodontic appliance, applied bimaxillary; after 21 months the appliance was removed and for contention were used polyester retainers wearing at night.

As can be seen in Figure 3, the orthodontic treatment achieved the patient's objective, namely the bimaxillary dental alignment. It also maintained the bilateral neutral relationship at the molars and the deviation of the upper median line to the right (due to the extraction of 13) and to the lower median line to the left (due to its extraction 33), a false correlation of the inter-incisive lines, anterior overbite of 1/2, with the leveling of the Spee curve.



Fig. 3 Appearance of dental arches at the end of orthodontic treatment

### Conclusions

Dental extractions in orthodontics are performed to solve dental crowding and only after establishing a correct diagnosis and a correct treatment plan. Extraction of

definitive canines is rarely recommended due to its functional role in guiding the mandible and protecting the neighboring teeth, but also its aesthetic role with its particular shape, ensuring the transition between the anterior and posterior teeth. The

loss of a canine makes canine guidance impossible and may compromise a good functional occlusal result. Contact between a premolar and a lateral incisor is often poor

and canines can act as ideal abutment teeth because of their long root length and resistance to periodontal problems (8,9).

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