

ASPECTS REGARDING THE PARTICULARITIES OF ORTHODONTIC TREATMENT OF ECTOPIC MAXILLARY CANINE TEETH IN THE ADULT PATIENT

Mioara Decusară^{*1}, Gina –Păunița Grecu,² Dorina-Cerasella Șincar¹

¹Assoc. Prof. "Dunărea de Jos" University, Galați, Romania, Faculty of Medicine and Pharmacy, Department of Dentistry

²Assist.univ. Drd. "Dunărea de Jos" University, Galați, Romania, Faculty of Medicine and Pharmacy, Department of Dentistry

* Corresponding author: e-mail: mioaradecu@yahoo.com

ABSTRACT

Orthodontic treatment has different and individualized indications and specifications depending on the dentomaxillary anomaly, the patient's age, and his good cooperation. If in children the treatment can be preventive, interceptive and curative, being accepted or not by parents or young patients, in adult patients the orthodontic treatment is curative, in collaboration or not with general dentist, with the prosthetist, surgeon, implantologist or periodontist, depending on the clinical and dento-periodontal status. One of the situations in which the adults require orthodontic treatment is the dental abnormality caused by ectopic palatal eruption or the impacted of maxillary canines. Thus, often adult patients are those who find that the persistent deciduous canine tooth has not been replaced by the permanent one, namely when it has increased mobility or exfoliated and falls or when a definitive canine maxillary canine tooth erupts behind the milky one.

Key words: ectopic maxillary canine teeth, adult patients, orthodontic treatment

INTRODUCTION

The main reason why adults request orthodontic treatment, sent or not by the general dentist, is the aesthetic one, for improvement in appearance. Proper recognition of the dental and facial esthetic defects at the outset of treatment is the most important key to esthetic success and is, therefore, essential to satisfying the patients' needs. For the adult patient, optimizing treatment involves a multidisciplinary team, including the orthodontist and general dentist and possibly an oral surgeon, a periodontist, prosthetist and an endodontist. Proper coordination of treatment and

communication between team members makes the difference between success and failure when ideal esthetics are the goal^{1,2,3}.

One of the situations for which the adults require orthodontic treatment is the dental abnormality caused by ectopic palatal eruption or under o prosthetic procedures of maxillary canine teeth; another cause is the impactation of permanent maxillary canines, with or without prolonged retention of the deciduous ones. It may be some acceptable or unacceptable explanations for the orthodontic treatment of ectopic erupted canines in adults: the persistence of maxillary deciduous canines was not

reported by the dentist at a routine check-up; or was reported, but the patient refused the proposed orthodontic treatment by financial reasons, the duration of the treatment or the idea of dental surgery; sometimes the dentist reported persistent milky canine tooth, but, at the patient's request, a dental cosmetics was performed until the start of orthodontic treatment^{1,4,5}.

Maxillary canine teeth contribute significantly to the esthetic, chewing and mandibular guide functions. Orthodontists should diagnose canine ectopic eruption early, trying to prevent retention of these teeth. Its multifactorial etiology involves general and local factors and the correct diagnosis depends on clinic, radiographic and/ or tomographic exams. Several therapeutic procedures depend on factors such as relationship between canine and adjacent structures, possibility of orthodontic movement and patient age^{5,6,7}.

Maxillary canines may remain included for a long time after eruptive age and may subsequently erupt ectopically (most commonly palatine) due to several causes^{4,7,8,9,10}:

- Long path of eruption, beginning close to the floor of the orbit; this tooth had much further to travel before it erupted into the mouth, so had a great chance of "losing its way"
- Crowding who affects the early mixed dentition: insufficient space for the lateral incisor to migrate labially between the root of the central incisor and the deciduous canine teeth, so the eruption will be lingual to the adjacent teeth. A

parallel situation is created when a second deciduous maxillary molar is extracted before its due time and the first permanent molar drifts mesially into the available space, so the second premolar develops palatally to the line of the arch, being able to modify the eruption path of the canine tooth.

- Non-resorption of the root of the deciduous canine can cause a palatal deflection of the eruption path of the permanent canine, leading to its impaction
- The trauma who have caused movement of the lateral incisor, or movement of unerupted canine
- Congenitally missing of lateral incisors or cone-shaped lateral incisors
- Heredity
- Sequelae from endocrine anomalies, fever, vitamin deficiency, and irradiation
- Local etiologic factors : discrepancy between dental arch length and tooth size, prolonged retention or early loss of primary canine, abnormal position of the tooth germ, ankylosis, cystic, neoplastic formation, root dilaceration, presence of alveolar fissure
- excessive growth in the base of maxillary bone

Orthodontic treatment planning depends on determining specific treatment objectives before beginning treatment. Selecting specific treatment objectives aids in the selection of appropriate

mechanotherapy for the patient, especially in adult patients. The orthodontic treatment in adults, with the exception of orthognathic surgery, follow exclusively the tooth movement because skeletal growth potential does not exist. The medical and dental histories of the adult patient may further increase the complexity of treatment. Coordinating orthodontic therapy with periodontists, restorative dentists, and other specialists is often necessary^{11,12,13,14}.

MATERIAL AND METHOD

In this paper we present different aspects of orthodontic treatment in adults who had maxillary canine teeth impacted or in eruption and ectopic position, in order to show how orthodontic therapy can restore the correct position of these teeth and how can facilitate and complement prosthetic rehabilitation.

Without being considered a statistical study, the cases were selected from a group of adult patients treated in an orthodontic practice in Braila, all the patients expressing their consent to participate in medical education.

CASE REPORTS

Female, 30-year-old (fig. 1a) requested orthodontic treatment, on the recommendation of the general dentist due to the retention of 53 (without physiological mobility) and the palatal impactation of 13. After 2 months from the beginning of the orthodontic treatment on the upper arch, 53 was extracted and was performed surgical exposure of the crown of 13 for the application of an orthodontic attachment and its buccally movement(fig.1 b). The braces was removed after 20 months, when the upper right canine tooth was aligned on the arch(fig.1 c)



Fig. 1 Orthodontic treatment in a 30-year old female patient, with persistence of 53 and palatal impactation of 13.

Another case, female, 24-year old, had malpositions of both upper permanent canine teeth: the one on the right side with 45 degree mesio-palato-rotation and the one of the left in palatal position, behind the lateral incisor, due to retention of deciduous

canine(fig. 2a, b, c) . After 18 months of orthodontic treatment on the upper arch, was achieved alignment of the both maxillary canine and a proper occlusal relationships (fig.2 d,e,f)

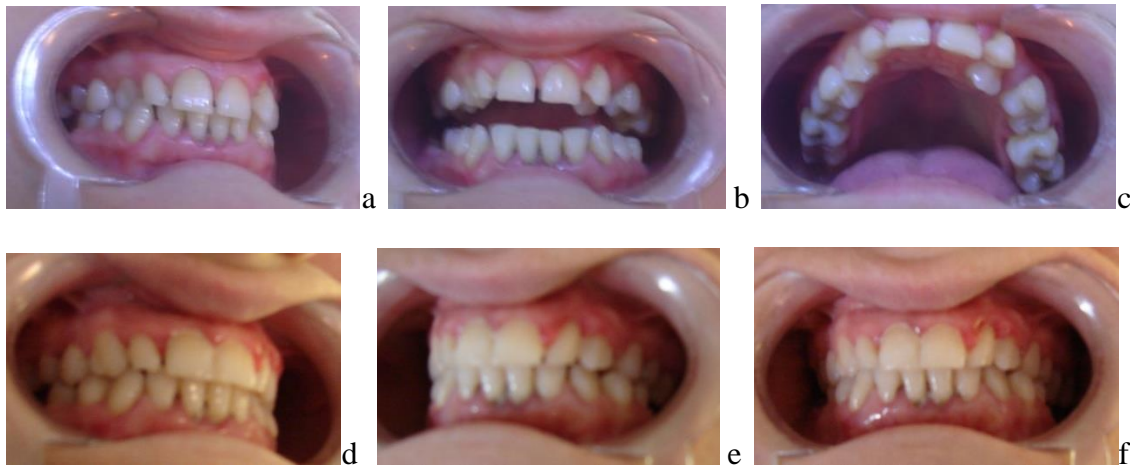


Fig. 2 Female 24-year old: lateral and frontal views of the dental arches , before and after orthodontic treatment

A 36-year old female, with a good dental occlusion, asked for orthodontic treatment to align the upper left permanent canine tooth, in palatal eruption

due the retention of 63 until this age. The malpositioned left canine was moved orthodontically in a proper occlusion after 16 months(fig. 3 a,b,c).



Fig. 3 The images of the position of 23, before and after 16 months of orthodontic, in a 36-year old female patient

In the case of 35-year old female, the prosthetic specialist requested the orthodontic correction of the malpositions of 13 and 15 for the subsequent application of a dental bridge on these teeth. Even if the upper right canine did not align perfectly, after 10 months the orthodontic appliance was removed, at the demand of the prosthetist. The canine guidance and mandibular propulsion and laterality

movements were blocked due to scissor occlusion between 13 (in palatal position) and 43. After 10 months of orthodontic treatment the specialist considered the new position of 13 as appropriate to preparation for the dental ridge, respecting the biological, mechanical and esthetic considerations, necessary for a successful tooth preparation and subsequent restoration (fig.4 a, b, c).



Fig.4 Preprosthodontic orthodontic treatment in a 34-year old female to correct the palatal position of 13 and palatal inclination of 15.

A last clinical case is a 47-year-old female, sent by general dentist for orthodontic treatment to extrusion of the left upper permanent canine tooth, impacted until this age because of the retention of deciduous canine, recently exfoliated. After five months and three orthodontic appointments, the impacted tooth was extruded and the braces was removed, even

if the canine has not reached the occlusal plane. The decision to discontinue orthodontic treatment was made by the general dentist, who has considered that the vertical movement and the new position of 23 are appropriate to minimal preparation for prosthetic restoration of these tooth (fig. 5 a, b, c, d).

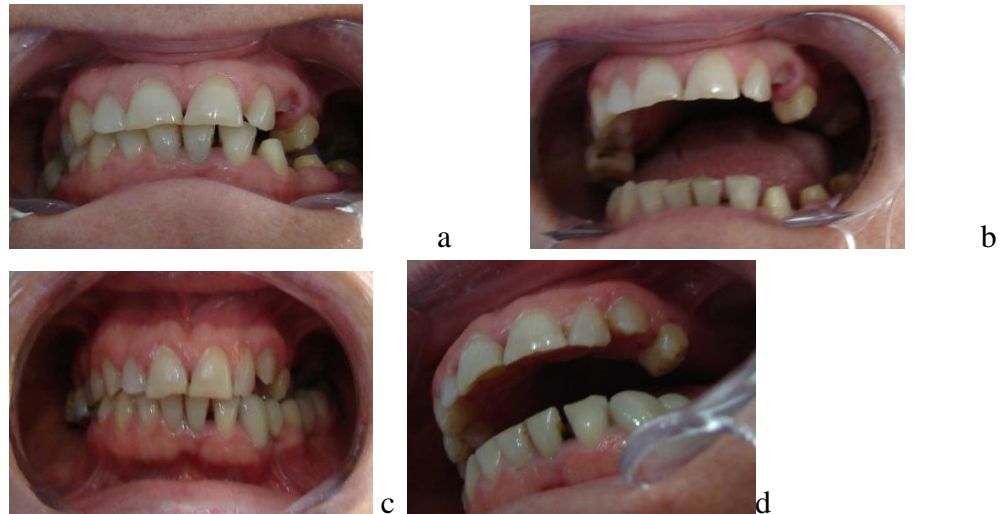


Fig.5 The orthodontic extrusion of the left upper permanent canine tooth, impacted under the crown of milky canine, which has exfoliated at 47 years age

DISCUSSION

Although canines are one of the last teeth to erupt, the dentists are not accustomed to prevent ectopic eruption from

occurring, so the early diagnosis and preventive intervention are possible, thus reducing the need for more complex treatment of permanent dentition^{15,16}. Early

diagnosis can minimize the problems caused by impaction, such as root resorption of canines and lateral incisors, ankylosis or infections resulted from impactation^{11,17}. Orthodontic traction in permanent dentition is aimed at positioning the canines in the dental arch without causing periodontal damage, since they play an important aesthetic and functional roles in the development of a normal occlusion^{18,19}. Traction and movement of teeth used to be a great challenge for orthodontists, mainly in those cases involving palatally impacted permanent canines, because such a treatment was frequently unsuccessful due to the surgical techniques employed at the time. In periodontal aspects, the esthetics, the establishment of normal function and periodontal health at the end of treatment are fundamental, because the patients, mainly adults, have the expectation regarding the probability of successful of the orthodontic treatment^{20,21,22,23}.

CONCLUSIONS

An increasing number of adults are undergoing orthodontic treatment, but they still make up only a small proportion of all adults who could benefit from such therapy.

REFERENCES

1. Becker A, Chaushu S. Dental age in maxillary canine ectopia. *Am J Orthod Dentofacial Orthop.* 2000; 117:657-62.
2. Nattrass C, Sandy JR. Adult orthodontics—a review. *Br J Orthod.* 1995;22:331-7.
3. Melsen Birte . Adult orthodontics . Wiley Blackwell, 2012
4. Becker A.- The orthodontic treatment of impacted teeth, Martin Dunitz, 1998
5. Cati G, Ghobadlu J, Nieri M, Clauser C. Factors associated with the duration of forced eruption of impacted maxillary canines: a retrospective study. *Am J Orthod Dentofacial Orthop.* 2006; 130: 349-56.
6. Ngan P, Hornbrook R, Weaver B. Early timely management of ectopically erupting maxillary

The purpose of this paper is to illustrate the appropriateness and value of orthodontic treatment in adults with impacted and ectopic position of permanent maxillary canines. Correction of malocclusion makes it possible to improve the quality of periodontal and restorative treatment outcomes, in addition to providing psychosocial benefits. General dentists are often the first dental professionals to suggest orthodontic treatment and to refer patients to orthodontic specialists. Moreover, with the growing emphasis on cosmetic dentistry, more adults are likely to seek information regarding orthodontic surgery.

Adults seeking orthodontic treatment can be excellent patients, with good motivation and cooperation, but the limitations and the timing of orthodontic treatment must be explained, at the beginning of treatment, as patients' expectations can be very high.

The orthodontic treatment of adults, which frequently presents general condition and compromised oral health, involves a wide interdisciplinary collaboration between specialists in orthodontics, periodontology, prosthetics, implantology, oral and maxillofacial surgery.

- canines. *Semin Orthod.* 2005; 11: 152-63. 19
7. Brin I, Solomon Y, Zilberman Y. Trauma as a possible etiologic factor in maxillary canine impaction. *Am J Orthod Dentofacial Orthop.* 1993; 104:132-7.
 8. Peck S, Peck L, Kataja M. The palatally displaced canine as a dental anomaly of genetic origin. *Angle Orthod.* 1994; 64: 249-56.
 9. Jacobs SG. Palatally impacted canines: a etiology of impaction and the scope for interception: report of cases outside the guidelines for interception. *Aust Dent J.* 1994; 39: 206-11.
 10. Becker A, Chaushu S. Success rate and duration of orthodontic treatment for adult patients with palatally impacted maxillary canines *Am J Orthod Dentofacial Orthop.* 2003; 124: 509-14.
 11. Shapira Y, Kuftinec M. Early diagnosis and interception of potential maxillary canine impaction. *J Am Dent Assoc.* 1998; 129: 1450-4.
 12. Bishara SE. Clinical management impacted of maxillary canines. *Semin Orthod.* 1998; 4: 87-98.
 13. Jacobs SG. Localization of the unerupted maxillary canine: how to and when to. *Am J Orthod Dentofacial Orthop.* 1999; 115: 314-22.
 14. Kokich VG. Surgical and orthodontic management of impacted maxillary canines. *Am J Orthod Dentofacial Orthop.* 2004; 126: 278-83.
 15. Burden DJ, Mullally BH, Robinson SN. Palatally ectopic canines: closed eruption versus open eruption. *Am J Orthod Dentofacial Orthop.* 1999; 115: 634-9.
 16. Stewart JA, Heo G, Glover KE, Williamson PC, Lam WN, Major PW. Factors that relate to treatment duration for patients with palatally impacted maxillary canines. *Am J Orthod Dentofacial Orthop.* 2001; 119: 216-25.
 17. Foucart J.-M., Felizardo R., Pizelle C., Bourriau J. Indications des examens radiologiques en orthopédie dento-faciale, *Orthod Fr* 2012;83:59–72
 18. Johnson D. , Periodontic and orthodontic treatment in adults, *Am J Orthod Dentofacial Orthop.*, 2003 Feb, 123(2): 13A
 19. Caranza A., Fermon J., Neal C., *Orthodontic considerations in periodontal therapy in Clinical Periodontology*, Mosby, 2000
 20. Mioara Decusară, Dorina-Cerasella Șincar, Gabriel Valeriu Popa–Aspecte clinico-terapeutice în incluzia dentară. *Revista Română de Stomatologie*, 2017, 63(3): 124-128.
 21. Mesotten K, Naert I, Van Steenberghe D, Willems G. Bilaterally impacted maxillary canines and multiple missing teeth: a challenging adult case. *Orthod Craniofacial Res.* 2005; 8: 29-40.
 22. Mioara Decusară, Cerasella-Dorina Șincar, Gabriel-Valeriu Popa, Gabriela Popa – Transmigration of impacted mandibular canines- case report , *Revista Română de Stomatologie*, 2019, 65(3): 258-263.
 23. Suri S, Utreja A, Rattan V. Orthodontic treatment of bilaterally impacted maxillary canines in an adult. *Am. J Orthod Dentofacial Orthop.* 2002; 429: 429-37.