SURGICAL-ORTHODONTIC TREATMENT OF IMPACTED CANINES

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Abstract: The main purpose of our study is to present the corrective movement of impacted canines using various surgical-orthodontic techniques.

Materials and method: The study was conducted on a batch of 27 patients aged 18 to 25 years, which were examined in Oral and Maxillofacial Surgery Ambulatory of Iași and in Dr. Bogdan Stelea’s private practice, between 2006 and 2007. The batch was formed by 22 patients with upper impacted canine and 5 patients with lower impacted canine. For this study we used only the batch of patients who presented upper impacted canine. Depending on the clinical status, we used the following surgical techniques: repositioned flap, gingival translation flap, window flap method and local mesh application. After surgery for 19 patients we considered that canine traction with an orthodontic device was necessary in order to obtain a vertical position of the teeth. The orthodontic systems used were: fixed orthodontics, ballista spring system or simple metallic clasps fixed on molar rings.

Results and discussion: We used the repositioned flap for 3 patients with deep impacted canines in order to uncover the teeth and to bond an auxiliary orthodontic device, the gingival translation flap for 7 patients with superficial impacted canines: 5 cases with apical translation and 2 with lateral and apical translation. The window flap was used for 12 patients with palatal impaction. After surgery all patients continued orthodontic treatment in order to correct every dental malposition and to obtain a neutral occlusion with esthetical, functional and stable results.

Key words: impacted canines, repositioned flap, gingival translation flap, window flap, surgical-orthodontic treatment.

INTRODUCTION
Dental impaction represents a frequent anomaly in dentistry. Because of the uncertainty hovering upon canine impaction evolution and prognosis dental practitioners hesitate in proposing surgical-orthodontic treatment. This is why dental practitioners have to be instructed in diagnosis and treatment procedures of this condition, to know the differences of surgical approaches of the palatal and vestibular impacted canine and the various methods of traction and force directing. Dental practice has shown that it’s not enough to obtain only the alignment of the impacted tooth, but it is also necessary to accomplish a healthy periodontal complex in order to prevent periodontal recession with or without dental mobility.

Upper canine inclusion is more frequent than lower impaction (with a minimum ratio of 4 to 1), in 57% cases in women (Becker, 2003). Palatal localization is six times more frequent compared to buccal impaction.

The etiological factors for upper canine inclusion were less cited in literature. Most authors concur with the idea that the eruption route of the upper canines is more difficult comparing with other teeth.

Deficiency in dental arch length is valid for the majority of the inclusions, but not for upper canines. Studies show that 85% of the palatal impacted canines (Bishara, 1998) have enough space for eruption, coexisting with agenesis or malformations of upper lateral incisor. For buccal impaction, only in some cases the teeth have enough space for eruption, while in rest the impaction coexists with the deficiency in dental arch length. Lately the multifactorial etiology has gained supporters, because it explains the existence of this anomaly in patients with enough space on the dental arch (Bado, 2005).
Clinical evaluation of canine impaction has an orientative value, the absolute diagnosis being possible only after performing complementary exams, such as: retrodentoalveolar X-ray, orthopantomography, teleradiography, occlusal radiography, CT scan and 2D and 3D reconstructions.

The therapeutic alternatives are diverse and vary from absence of treatment (when the patient rejects the treatment) to extraction of the impacted tooth (in case of radicular resorption, dentoalveolar ankylosis or bulky cystic formations), surgical-orthodontic treatment or self-transplant.

The main purpose of our study is to present the corrective movement of impacted canines using various surgical-orthodontic techniques.

MATERIAL AND METHOD

The study was conducted on a batch of 27 patients aged 18 to 25 years, which were examined and treated in OMF Surgery Ambulatory of Iasi and in Dr. Bogdan Stelea’s private practice, between 2006 and 2007. The distribution of the cases was as follows: 22 patients with upper impacted canine (12 patients with differences between mezio-distal distances of the canines and the existent space, 2 patients with complex odontoma, 3 patients with cystic formations and 1 patient with dento-alveolar ankylosis) and 5 patients with lower impacted canine. For this study we used only the batch of patients who presented upper impacted canine, with the following distribution: 12 patients with palatal impaction and 10 patients with buccal impaction.

Surgical-orthodontic recovery of impacted canines involves three steps:

- The first is the pre-surgical orthodontic step which has the purpose of creating the necessary space for the canine alignment.
- The second is the surgical step and the third is the post-surgical orthodontic treatment which accomplishes the alignment of the canine within the dental arch.

Depending on the clinical status, we used the following surgical techniques: repositioned flap, gingival translation flap and window flap method.

On the 3 patients with deep buccal impaction we used the repositioned flap because the gingival tissue cannot be positioned in the vestibule in order to uncover the tooth and to bond the auxiliary orthodontic device (Fig. 1).

![Fig.1. Buccal repositioned flap](image)

We used the gingival translation flap for the 7 patients with superficial buccal impacted canine: apical translation for 5 patients (fig. 2) and lateral and apical translation for 2 patients respectively (fig.3).
For the 12 patients with palatal impaction we applied the window flap method (Fig. 4).
For the three cases of impaction in which we diagnosed dentigerous cysts we performed cystectomies followed by meshing of the post-surgical cavity. The patient with dento-alveolar ankylosis underwent dental extraction. After surgery the orthodontist performed canine traction with an orthodontic device was necessary in order to obtain a vertical position of the teeth. The orthodontic systems used were: fixed orthodontics, ballista spring system or simple metallic clasps fixed on molar rings (Fig. 5).
After surgery all patients continued orthodontic treatment in order to correct every dental malposition and to obtain a neutral occlusion with esthetical, functional and stable results.

RESULTS AND DISCUSSION
The purpose of our study was to analyze the indications of surgical methods according to the clinical status of each case. In deep impactions, because the gingival tissue cannot be positioned in the vestibule in order to uncover the tooth and to bond the auxiliary orthodontic device, it is recommended the use of muco-periostal repositioned flap with passive guidance of the impacted canine. The apical translation flap has the purpose of assuring the uncovering of the teeth and provides the amount of periodontal tissue for the repositioned canine. Due to the fact that
the lower margin of the flap is positioned in direct contact with the tooth, this method contributes to periodontal restoration. The window flap used in palatal impaction avoids extensive decollation of the mucosa, allows the attachment of orthodontic devices and minimizes the trauma to the marginal periodontal tissue. Periodontal follow-up 6 month after surgery shows that in the cases in which we used the repositioned flap, apical translation flap and window flap there were no periodontal recessions or dental mobility which could compromise the treatment. Conversely, in the cases in which we used the lateral and apical translation method and meshing, the periodontal tissue was damaged and it needed surgical restoration.

CONCLUSIONS
We recommend conservatory surgical orthodontic treatment due to its role in alveolar bone formation during the movement of an impacted tooth, with restoration of the periodontium with esthetical and functional implications.

REFERENCES