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SURGICAL PROCEDURE OF IMPACTED MANDIBULAR CANINE- CASE REPORT

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Abstract

Failure of tooth eruption into the oral cavity, whether due to insufficient space or the presence of an obstruction blocking its eruption path, may result in various conditions such as impaction, transmigration, retention, or malposition/displacement.

The occurrence of impaction and/or non-eruption of mandibular canines is uncommon, with prevalence rates ranging from 0.05% to 0.4%. There are two primary methods for performing corticotomy: the open and closed methods.

The aim of this case presentation is to illustrate the closed corticotomy method performed on an impacted mandibular canine, which is considered a rare occurrence. This case report involves a 17-year-old girl who underwent a closed surgical approach to corticotomy, with a brace placed during the intervention. Postoperative examinations were conducted on the second and seventh days, during which the sutures were removed.

The postoperative course was uneventful, with no complications such as pain, redness, or edema. The closed surgical approach to corticotomy is a minimally invasive technique with minimal side effects.

***Key words*:** corticotomy, eruption, alveolar ridge, impacted canine, braces.

Introduction

Tooth impaction is defined as the failure of a tooth to erupt into the dental arch within the physiological timeframe of normal eruption [1,2,3]. The inability of a tooth to emerge into the oral cavity, whether due to insufficient space or an obstruction along its eruption path, can lead to various conditions such as impaction, transmigration, retention, or malposition/displacement [4].

The impaction or non-eruption of mandibular canines is relatively uncommon, with reported prevalence rates ranging from 0.05% to 0.4% [5]. However, a study by Agastra et al. found a higher prevalence of 1.7%, exceeding previously reported values in the literature [6].

Similarly, a study conducted at Lagos Teaching Hospital in Nigeria reported a prevalence of 1.36% [7]. While classifications exist for impacted third molars, impacted canines also have established classification systems. One of the most widely used classifications for impacted and transmigrated mandibular canines is the Mupparapu classification. Mupparapu [8] categorized transmigrated mandibular canines into five types based on their migratory pattern, inclination of the longitudinal axis, final position within the mandible, and their relation to adjacent teeth, the midline, and the contralateral erupted canine. Additionally, impacted mandibular canines are more frequently located on the labial aspect of the alveolar ridge compared to maxillary canines [9].

The removal of impacted teeth is commonly performed using an intraoral surgical approach. Several treatment options have been proposed for impacted mandibular canines, including surgical removal, exposure with orthodontic alignment using braces, transplantation, and observation. Some researchers suggest that asymptomatic impacted teeth may be left in place; however, in such cases, periodic radiographic monitoring is recommended [10].

The aim of this case presentation is to illustrate the closed surgical approach of corticotomy performed on an impacted mandibular canine, a rare occurrence in impacted tooth positions.

Case report

The surgical approach for canine impaction can be performed using either the classic method or a closed surgical approach. This case report presents a closed corticotomy method performed on a 17-year-old patient who visited the Department of Oral Surgery at the University Dental Clinical Center. Clinical examination revealed a missing tooth in the mandibular dental arch, specifically in the left canine region (Figure 1).

Figure 1. Missing canine in the mandibular

The panoramic X-ray examination revealed multiple impacted teeth, including the upper right and mandibular canines, as well as the maxillary left and right third molars. The impacted mandibular canine was not in its correct position (Figure 2).

Figure 2. Panoramic x ray

The patient, had previously undergone orthodontic treatment to create sufficient space for the placement of the mandibular canine, Once the space was established, the patient was scheduled for surgery. The procedure was performed under local anesthesia targeting the inferior alveolar nerve, using the local anesthetic Scandonest 2%. (Figure 3)

Figure 3. Local anesthesia

The intervention was performed in collaboration with an orthodontist. Corticotomy can be conducted using either an open or closed method. In this case, the closed corticotomy method was chosen. All aseptic preparations of the operative field were carried out. The incision approach was made from the vestibular side. After making the incision with a No. 15 scalpel, an osteotomy was performed using round drills to expose the impacted mandibular canine (Figure 4). The canine was positioned lingually with mesial rotation.

Figure 4. Exposed canine after osteotomy

After exposure of the canine, the orthodontist placed the brace, and a traction wire was attached to the brace to pull the mandibular canine into the dental arch. The wire was then secured to the archwire of the orthodontic fixed appliance (Figures 5, 6).

Figure 5 and 6. Placing braces

At the end of the intervention, a suture was placed, as part of the procedure of the closed surgical approach of corticotomy, (the incisional flap is returned to its place, so that the entire brace is covered, without making an excision of the mucosa). Control examinations were performed on the second and seventh postoperative days, when the sutures were removed. (Figure 7). The postoperative curse was without any complication, redness, with no pain or swelling.

Figure 7. Suture

Discussion

Impacted mandibular canines are relatively rare compared to impacted upper canines. According to a systematic review by Sathyanarayana et al., which included 19 studies, the prevalence of mandibular canine impaction ranged from 0.008% to 1.29%, while the prevalence of mandibular canine transmigration ranged from 0.12% to 0.98% [11].

The treatment of impacted canines is typically surgical. In collaboration with orthodontists, and depending on clinical findings and the patient's preferences, impacted mandibular canines may be extracted, corticotomy may be performed, or the condition may be observed. The combined approach of surgically exposing the impacted mandibular canine and correcting its position orthodontically was described in the case report by Anadha et al., where the patient's main concern—an unpleasant smile—was addressed, leading to the reestablishment of a balanced smile [12].

Traction of impacted mandibular canines presents a challenge for orthodontists, especially when the canines are in a transmigrated position. The biomechanical design of the treatment is crucial for success in these cases. It is recommended to apply light forces for better control of the movement vectors, as there is a high risk of damaging the roots of adjacent teeth, particularly in Mupparapu type 2 cases [13].

In the study by Gerasimova Pisevska et al., a case of a 12-year-old girl with an impacted and ankylosed upper canine was presented, in which corticotomy-assisted orthodontic treatment was performed [14].

Conclusion

The closed surgical approach to corticotomy is a minimally invasive technique with minimal side effects. The likelihood of unwanted complications, such as prolonged healing, pain, and infections, is significantly reduced, and the need for postoperative control examinations is minimized.

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