

Case Report**Buccal Split and Palatal Pull Out - A Novel Approach for
Canine Impaction: A Case Report**

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Abstract...

Introduction: Maxillary canines are the third most common teeth to be impacted next to mandibular and maxillary third molars. There are various methods of management of canine impactions, decided based on some factors. If sufficient space is available in the dental arch or if sufficient space can be created, then impacted canine can be orthodontically managed after surgical exposure. If the space is insufficient or the presence of any associated resorption of the root of adjacent teeth, mandates the surgical removal of impacted canines.

Case discussion: A 37 year old female patient reported to our center for a routine dental check-up. Clinical examination revealed a missing 13 with a bulge in the palatal mucosa in relation to 11 and 12. Orthopantomograph revealed an impacted 13. After orthodontic consultation guided movement of the canine to the desired position was deemed to be not feasible and surgical removal of the impacted maxillary canine 13 under conscious sedation was suggested to be the treatment plan. After incision and mucoperiosteal flap elevation both buccally and palatally, palatal bone guttering was done to completely expose the crown till the CEJ. This was followed by buccal guttering to expose the root. A horizontal split of the root was carried out at the mid root level from the buccal side. The root up to the mid third was removed buccally. This was followed by palatal pull out of the remaining portion of 13.

Conclusion: The novel technique of management of impacted maxillary canines by the buccal split and palatal pull out method discussed in this case report proves to be effective in the management of bucco-palatal impaction of Maxillary canines.

Keywords: Canine; Impaction; Buccal; Split; Palatal; Pull-out.

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Introduction

An impacted tooth is one whose eruption has been delayed considerably and there is sufficient evidence both radiographically and clinically to confirm that the tooth will not erupt to a functional occlusion in the near future. Impaction of permanent teeth is a common phenomenon with the mandibular and maxillary third molar being the most frequently impacted of all [1].

Maxillary canines are the third most common teeth to be impacted next to mandibular and maxillary third molars. There are a number of factors that can be attributed to the impaction of maxillary canines. These factors can be generally classified as local or genetic, posing a hereditary influence [2]. The local factors include crowding, dial creation, abnormal position of tooth bud, cystic formation, early loss or prolonged retention of Deciduous canine, abnormal position of adjacent teeth impeding the pathway of eruption of canine [3]. Another most important etiology is the long pathway of eruption of maxillary canines starting at a point lateral to the piriform fossa to the final position in the dental arch. This pathway is not only long but also tortuous adding to the complexity of eruption [4,5]. The final position of impacted canines can be buccal, palatal, bucco-palatal or in arch. Some authors have reasoned out such Buccal or palatal displacement of canines [6]. A Buccal displacement of canine is frequently attributed to insufficient space for eruption whereas a palatal displacement is seen even in patients without crowding. It is frequently reported in patients with an absent lateral incisor [7]. The absence of a lateral incisor guidance according to guidance theory can lead to a cross back of canine from the Buccal to the palatal side. Also, a smaller mesiodens crown width and shorter root of maxillary lateral incisor has also been quoted by some other authors. There is a genetic influence in palatal displacement apart from lateral incisor aplasia [5,6].

The diagnosis of impacted canines starts from clinical examination, wherein in some patients a prominent canine bulge can be observed in the buccal or palatal aspect of the oral mucosa. According to Ericson and Kuroi, the absence of a prominent canine bulge does not rule out the absence of a canine impaction. Next step in the evaluation of canine impactions is a 2-dimensional panoramic radiograph. Though this provides information on the position of impacted canines, a three dimensional CBCT imaging provides an accurate localization of the impacted canine. There are various methods of management of canine impactions, decided based on some factors. If sufficient space is available in the dental arch or if sufficient space can be created, then impacted canine can be orthodontically managed after surgical exposure. If the space is insufficient or the presence of any associated resorption of the root of adjacent teeth, mandates the surgical removal of impacted canines.

There are very few case reports and studies discussing the surgical management of impacted canines. This technical note elaborates on a case of bucco-palatal maxillary canine impaction that was removed by a Buccal split and palatal pull-out technique.

Case report

A 37 year old female patient reported to our center for a routine dental check-up. Clinical examination revealed a miss-

ing right upper canine and on palpation a palatal bulge was observed in the palatal mucosa in relation to 11,12 (Figure 1). Further radiological investigation using an Orthopantomograph revealed an impacted 13. A Cone Beam Computed Tomography of facial skeleton was done for exact localization of impacted 13 (Figure 2). The CBCT revealed a bucco-palatal position with the crown positioned palatally and root labially (Figure 3,4). After orthodontic consultation guided movement of the canine to the desired position was deemed to be not feasible and surgical removal of the impacted maxillary canine 13 under conscious sedation was suggested to be the treatment plan. After obtaining anesthetist fitness for surgery and the written informed consent from the patient, the surgical procedure was carried out under conscious sedation.

Surgical procedure

Under conscious sedation, standard surgical scrubbing and draping was done. 2ml of Lignocaine with 1:2,00,000 dilution of adrenaline was used for an infraorbital nerve block of the right maxilla and anterior palatine nerve block, anesthetizing 11-15 and the associated palatal and Buccal mucosa. Local infiltrations were given labially in relation to 11,12 and 13. Crevicular incision was given irt 15-23 palatally labial crevicular incision with anterior release was placed between 12 to 14 and mucoperiosteal flap was reflected to expose sound bone. Palatal bone guttering was done to completely expose the crown till the CEJ (Figure 5). This was followed by buccal guttering to expose the root (Figure 6). A horizontal split of the root was carried out at the mid root level from the buccal side. The root up to the mid third was removed buccally. This was followed by palatal pull out of the remaining portion of 13 (Figure 7). Hemostasis was achieved and closure was done using 3-0 vicryl. Recovery was uneventful and the patient was stable. The patient was prescribed an analgesic and antibiotic regimen for 5 days. Patient was reviewed after 1 week and the healing was satisfactory.



Figure 1: Intraoral palatal aspect showing palatal bulge in relation to 11 and 12.



Figure 2: Orthopantomograph revealing impacted 13.



Figure 5: Exposure of palatally impacted crown.

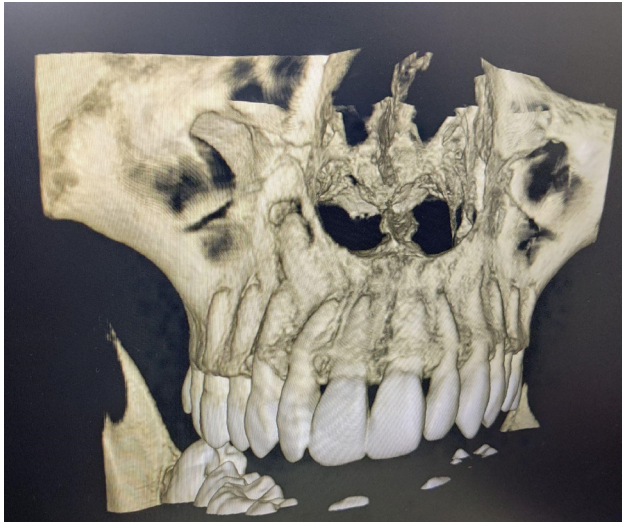


Figure 3: CBCT 3D image - Buccal aspect.



Figure 6: Exposure of buccally placed root of 13.

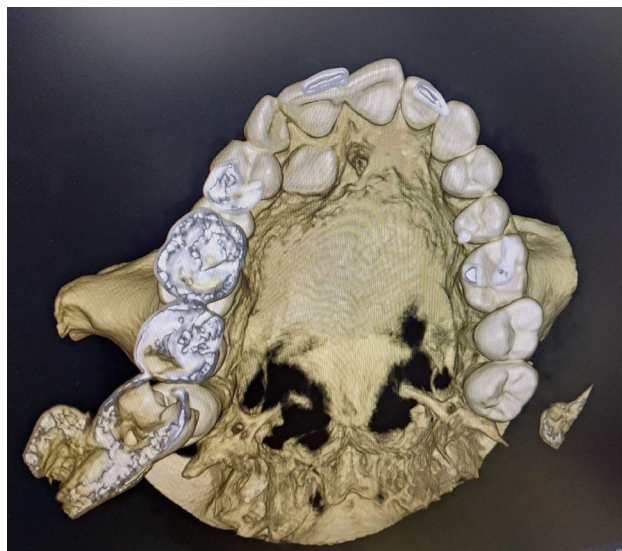


Figure 4: CBCT 3D image - palatal aspect.



Figure 7: Crown and root of 13.

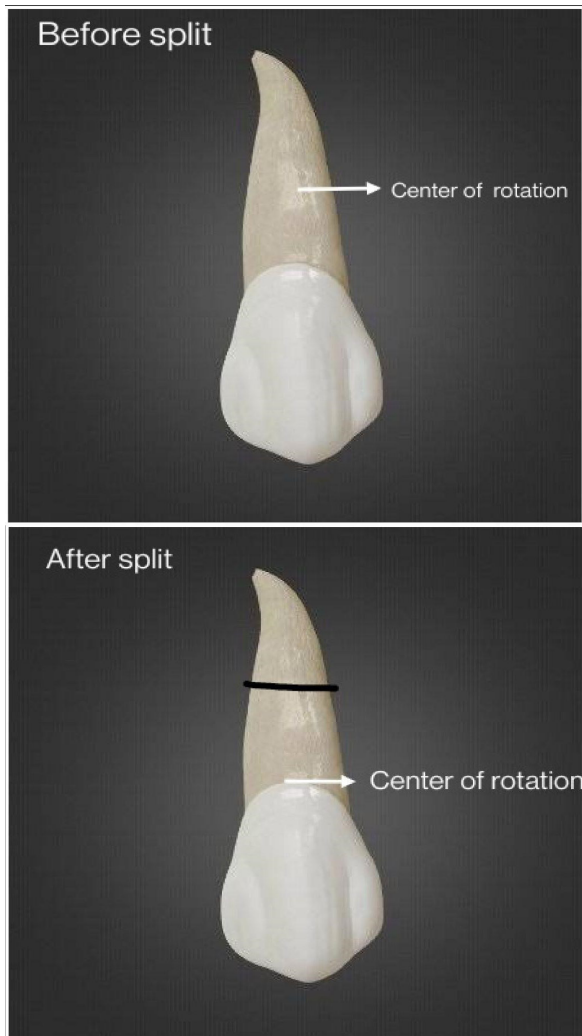


Figure 8: Change in the center of rotation after split.

Discussion

There are several techniques that can be adopted for the treatment of Maxillary canine impactions. The method of choice is decided based on several factors like the chronological age of the patient, eruption status, type of impaction, angulation and degree of impaction, relation to adjacent teeth, root Resorption of adjacent teeth, proximity to the Maxillary sinus, spacing or crowding in the dental arch, accessibility or availability of treatment modalities, patient's medical status and finally the patient's choice of treatment.

No treatment required

Very rarely in case of asymptomatic patients, the need for removal of the impacted canine is eliminated. This is decided by the position of the impacted Maxillary canine. If the position of the canine is too high, and the surgical approach is difficult or complex, the need for surgical removal can be reconsidered. However, there is always an impending danger of cystic transformation. This can be managed by a routine radiographic examination every six months [8].

Surgical exposure of tooth and orthodontic treatment

This is one of the most common treatment modalities for an impacted maxillary canine. In order to carry out this treatment, a space analysis is important. Further, the canine must also be in a favorable position. Based on these, if sufficient space is available or can be created by orthodontic treatment, surgi-

cal exposure of the impacted canine followed by orthodontic bonding is done. Application of controlled and planned traction forces can bring the canine to its normal position in the arch [9]. Orthodontic alignment is difficult in palatally impacted teeth especially when the cuspal tip of the impacted tooth is inclined such that it crosses the Root apex of the adjacent tooth.

Surgical removal of impacted tooth

Surgical removal is indicated in cases where orthodontic treatment is not possible, or the patient is not willing for the same. It is also done in cases where the position of the canine is not favorable. Depending on the position of the canine and type of impaction, the surgical approach also varies [10]. A totally buccally displaced canine requires only Buccal flap elevation and bone guttering and vice versa for a palatally displaced canine. However, in case of bucco-palatal impaction, a single sided approach is associated with the need for extensive bone removal. This can be minimized by using bucco - palatal approach as described in the current paper.

The technique involves tooth split at the mid root level from the opposite side in bucco- palatally placed oblique impactions. This shifts the center of rotation more cervically to the Level of Cemento enamel junction or cervical root segment compared to the regular of the center of rotation that's located in the mid root level, enhancing the ease of removal (Figure 8).

This case report has provided a new technique wherein the root on the Buccal side is split and the palatal aspect is used for a pull out of the crown and remaining portion of the root.

Conclusion

There is very few evidence in existing literature discussing the different approaches for the surgical management of impacted canines. This case report has discussed a novel technique of management of impacted maxillary canines by the buccal split and palatal pull out method. The satisfactory results obtained in this case, prove this method to be effective in the management of bucco-palatal impaction of Maxillary canines.

Conflicts of interest: None declared

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