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INTERDISPLINARY MANAGEMENT OF BILATERAL PALATALLY IMPACTED CANINES: A CASE REPORT

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ABSTRACT

Dealing with impacted maxillary teeth can be quite challenging for dental professionals. Palatal impaction of maxillary canines is a common developmental anomaly requiring coordinated periodontal–orthodontic management. Surgical exposure aims to facilitate orthodontic traction while preserving attached gingiva, periodontal health, and aesthetics. Among available approaches, the closed eruption technique is widely advocated for palatally impacted canines due to its ability to simulate physiologic eruption and achieve favourable long-term soft tissue outcomes. This case report describes the management of bilateral palatally impacted maxillary canines using a periodontal surgical approach.

KEYWORDS: Canine impaction, palatal impaction of maxillary canines, closed eruption technique, surgical exposure.

INTRODUCTION

Maxillary canines play a critical role in facial aesthetics, functional occlusion, and guidance during mandibular movements. The second most commonly impacted tooth, after the maxillary third molar, is the maxillary canine, with an incidence from 1% to 2.5%.[1] Palatal displacement occurring more commonly than labial displacement. Palatal impaction accounts for approximately 43–87% of all impacted canine cases.[2] The etiology of palatally impacted canines is multifactorial and includes genetic predisposition, absence or anomaly of lateral incisors, and disturbances in the eruption path. Early diagnosis and appropriate interceptive measures may reduce the severity of impaction; however, many cases require combined surgical and orthodontic intervention.

The primary objective of surgical exposure is to facilitate orthodontic alignment while preserving periodontal health, gingival contour, and long-term aesthetic outcomes. From a periodontal standpoint, the surgical exposure and orthodontic traction of palatally impacted canines can influence the long-term health of surrounding tissues.

Among the various surgical techniques described, the closed eruption technique is widely recommended for palatally impacted canines, as it allows the tooth to erupt along a physiologic path through attached gingiva, thereby minimizing gingival recession and attachment loss.[3] In bilateral cases, the complexity increases due to the need for symmetrical aesthetic and functional outcomes. Periodontal considerations become even more critical, as bilateral surgical manipulation may predispose the patient to increased inflammation, attachment loss, or recession if not meticulously managed.

This article aims to explore the periodontal outcomes of bilateral palatal canine exposure, evaluating both surgical techniques and orthodontic protocols, while emphasizing the importance of interdisciplinary planning to preserve periodontal health.

CASE PRESENTATION

A 17-year-old male patient referred from the department of Orthodontics and Dentofacial Orthopaedic came to the department of Periodontology and Oral Implantology with complaint of bilaterally impacted canines. His

medical and family history was non-contributory.

Extra-oral examination: straight profile, potentially incompetent lips, average upper and procumbent lower lip, average nasolabial angle. Orthognathic maxilla and mandible superimposed on skeletal class I jaw bases with horizontal growth pattern.

Intra-oral examination: class I molar relation on bilateral side and absence of permanent maxillary canines. Class I incisor relationship, proclined upper anterior teeth and impacted 13, 23.

No abnormal swelling and pathology was noted on palpation.

Radiographic evaluation: CBCT reports confirmed the palatal impaction of both 13 and 23. The long axis of both the canines were favourable, without root resorption of adjacent teeth. (Fig. 1)

THERAPEUTIC FOCUS AND TREATMENT PLAN

Fixed appliances with 0.022" slot metal brackets were bonded. Levelling and alignment were done using round NiTi wire (0.014", 0.016", 0.018") sequentially. At rigid wire stage patient referred to department of periodontology. Fixed appliance treatment to create space for a palatally impacted canine is an effective management option for children with impacted maxillary canines.[4]

The treatment objective was to surgically expose the impacted canines and facilitate their orthodontic alignment. After the informed consent, surgical exposure was performed using Closed Eruption Technique. Initially, retained deciduous canines were preserved to maintain space, but were extracted at the time of surgical exposure.[5]

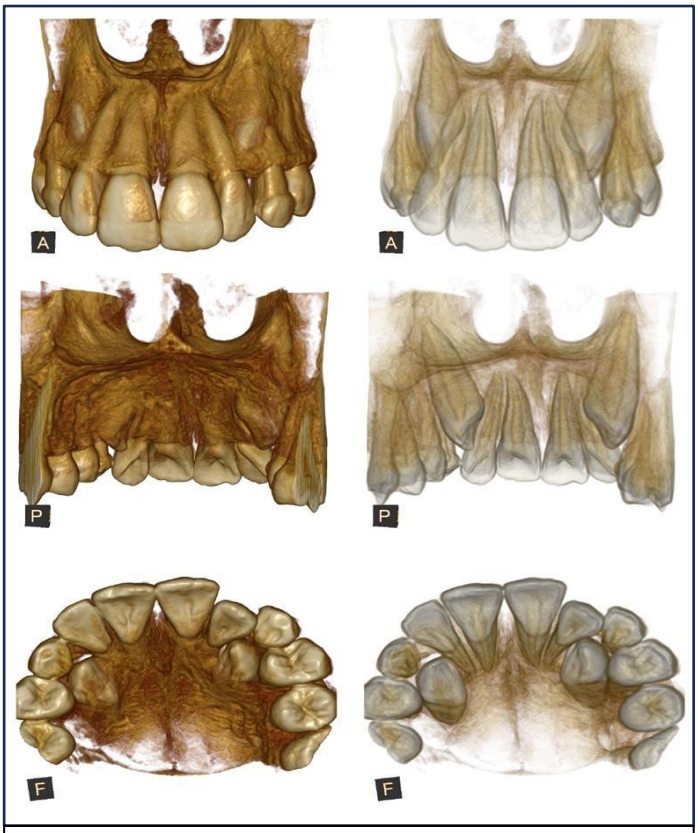

Fig. 1 CBCT reports

Surgical procedure

- The patient was anaesthetized by giving greater palatine nerve block with 2% lignocaine plus adrenaline.
- Sulcular incision was given on palatal side with the help of 12 No blade.
- Extraction of 53 and 63 was done. (Fig. 4)
- Full thickness flap was elevated from the palatal side.
- After elevation of the flap, crown surface of 13 and 23 became visible. (Fig. 5)
- Hemostasias was achieved, and the surgical site was irrigated with saline.
- Orthodontics lingual attachments were bonded on the exposed tooth surfaces. (Fig. 5)
- Flap was repositioned on the tooth surface, covering it entirely.
- Sutures were given with the help of 4-0 silk sutures. (Fig. 6 and Fig. 7)

Post-operative instructions were given to the patients. Analgesic, antibiotics and chlorhexidine mouth wash for

5 days was prescribed. Sutures were removed after 7 days.

Orthodontic treatment plan

A bonded lingual attachment was placed, and initial traction was applied using a ligature wire. After 2 weeks of healing, a ballista spring (Jacoby) made from 0.014" Australian wire was used for active canine traction (Fig. 8). The ballista spring works by storing energy through torsion of the horizontal arm placed in the premolar bracket slot and molar headgear tube. A vertical arm, positioned 2mm short of the canine crown, delivered controlled palatal and occlusal force.[5] After that when teeth reached to occlusal level piggy back technique was used.

After three months follow up visit, eruption of 13 and 23 can be seen in the oral cavity. (Fig. 9,10,11)

Fig. 2 Pre-operative view (buccal)

Fig. 3 Pre-operative view (palatal)

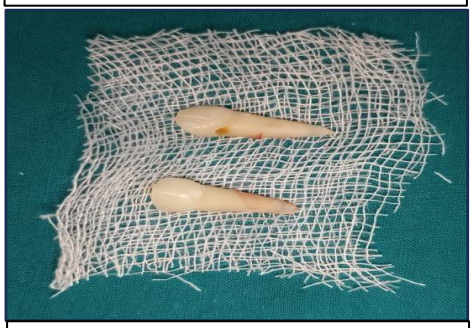

Fig. 4 Extracted 53 and 65

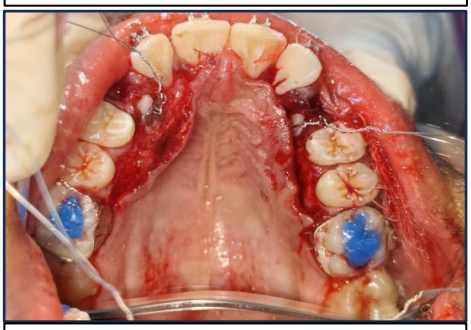

Fig. 5 Exposure of 13 and 23

Fig. 6 Suturing (buccal)

Fig. 7 Suturing (palatal)

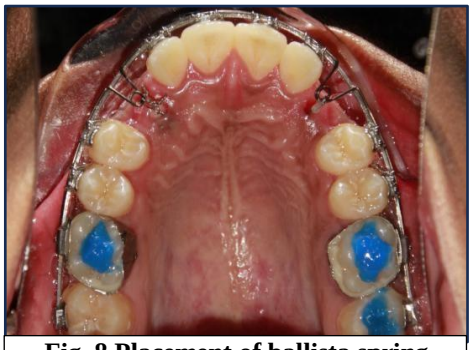

Fig. 8 Placement of ballista spring

Fig. 9 Follow up after 3 months (13)

Fig. 10 Follow up after 3 months (23)

Fig. 11 Follow up after 3 months (buccal view)

DISCUSSION

Management of impacted maxillary canines requires an interdisciplinary approach, integrating surgical exposure with controlled orthodontic traction to achieve optimal functional and periodontal outcomes.[6] A key decision in treatment planning is the choice between open surgical exposure and the closed eruption technique. While both methods aim to facilitate tooth eruption into the dental arch, evidence suggests that the closed technique offers advantages in maintaining periodontal integrity and soft tissue architecture, particularly in palatally impacted cases like the present one.

The closed eruption technique is designed to more closely replicate the physiologic eruption pathway by preserving the mucoperiosteal envelope over the impacted crown. This approach minimizes disruption of soft tissues and aims to maintain the zone of keratinized gingiva and attached gingival architecture, which are critical for periodontal health around the erupted tooth.

A retrospective study by Luyten et al.[7] comparing open and closed exposure techniques found no statistically significant difference in periodontal health, although closed techniques were preferred for aesthetic outcomes. Similarly, a systematic review by BMC Oral Health emphasized the importance of periodontal monitoring during and after canine eruption**,** noting that improper force application or delayed intervention could compromise periodontal stability.[8] Natural eruption and conservative surgical exposure with orthodontic alignment have minor effects on the periodontium.[9] A cohort study comparing open and closed techniques reported that closed eruption was associated with better preservation of periodontal ligament and alveolar bone support, suggesting less compromise of periodontal structures during the guided eruption process.[7] Furthermore, systematic review evidence indicates that, specifically for palatally impacted canines, the closed technique tends to yield superior periodontal results when evaluated over extended follow-up periods post-treatment, supporting its preferential use in such clinical scenarios.[10]

In the current case, the bilateral palatal impactions of 13 and 23 represented ideal indications for the closed eruption approach. The palatal position increases the risk of mucosal disruption and loss of attached gingiva if an open technique is used; therefore, closed exposure was chosen to promote periodontal preservation while facilitating guided eruption into the dental arch.

CONCLUSION

The management of bilaterally impacted maxillary canines requires careful diagnosis, precise surgical technique, and close orthodontic collaboration. The closed eruption technique proved to be a predictable and biologically favourable approach. By preserving the mucoperiosteal tissues and guiding the eruption through a physiologic pathway, this technique facilitated successful orthodontic alignment while maintaining periodontal health. The preservation of attached gingiva, stable gingival margins, and satisfactory periodontal parameters observed in this case support the use of the closed eruption approach, particularly in palatally impacted canines in young patients.

Maxillary canines are key teeth for smile aesthetics, arch form, and functional occlusion, so extraction of impacted canines should be avoided whenever possible. This case describes the successful orthodontic–surgical management of a palatally impacted maxillary canine.[5]

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