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Case Report

Management of Impacted Maxillary Canines-Simplest Method: A Case Report

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Abstract

Impacted canine teeth are a common issue. Upper canines are especially important for facial appearance and function. They support the lips, guide chewing, and are crucial for a correct smile. When these teeth become impacted and fail to erupt, it can disrupt a person's bite and even affect their self-esteem. While various treatment guidelines exist, there is no single agreed-upon method. This article presents a case study from Mahe institute of dental sciences, Chalakkara, where palatally impacted upper left canine were successfully guided into place using orthodontics.

Keywords: *Impacted Maxillary Canines; Orthodontics; Upper Canines*

Introduction

An impacted tooth, which fails to erupt into its proper position due to etiologies like malposition, insufficient arch space, or other obstructions, is a common clinical challenge [1]. The maxillary canines are the second most frequently impacted teeth, following third molars [2]. This prevalence creates a significant dilemma for clinicians, who must decide between extracting the tooth or guiding its eruption into the dental arch. Extraction is typically the preferred option when the canine is in an unfavourable position that may lead to further complications [3].

This decision is critically important due the canine's unique role in oral function and aesthetics. Its position at the corner of the arch makes it vital for supporting facial musculature and lip contour, thereby influencing facial appearance.

Furthermore, it acts as a cornerstone in occlusion, guiding mandibular movement and serving as a pivotal point in the arch form [4]. Ultimately, the failure of a maxillary canine to erupt can disrupt occlusal harmony and may also have negative consequences on an individual's psychological well-being [5].

Case Report

A 14-year-old female presented to the Department of Orthodontics with a chief complaint of crowded and missing teeth in her upper arch. Medical history revealed surgery for congenital heart disease at the age of one year. The clinical examination revealed Angle's class I molar relation, on right and left sides, upper and lower anterior crowding, retroclined 11, scissor bite irt 14, 15, clinically missing irt 32,

35, 45, palatally impacted tooth irt 23, decreased overjet, increased overbite, asymmetric dental arches, anterior crowding. The patient had facial asymmetry with squint eye. Extraorally, she had a convex facial profile (Figure 1), an acute nasolabial angle, and an average mentolabial sulcus. Diagnostic investigations, including radiographs and study models, confirmed these findings. Cephalometric analysis indicated a class II skeletal relationship with an orthognathic maxilla and retrognathic mandible. The analysis further showed a decrease in the axial inclination of the maxillary incisors, while the mandibular incisors were within normal limits.

Figure 1: *Extraoral photographs of the patient.*

Upon clinical assessment, a visual inspection identified a canine tip in the palate between the left lateral incisor and first premolar and the lateral incisor on that side was noted to be angled mesially and palatally as shown in the figure 2.

Figure 2: *Intra oral photographs of the patient.*

Prognostic evaluation

Canine position were assessed by radiographs (Figure 3) and cone beam computed tomography (Figure 3). On evaluation of the panoramic view there was a mild asymmetry in the condylar head, 35, 45 yet to erupt mild asymmetry seen in the condylar head region, maxillary proper bone deficient in the left side, retained deciduous present irt 35. Based on findings from cbct, 23 is partially and palatally impacted.

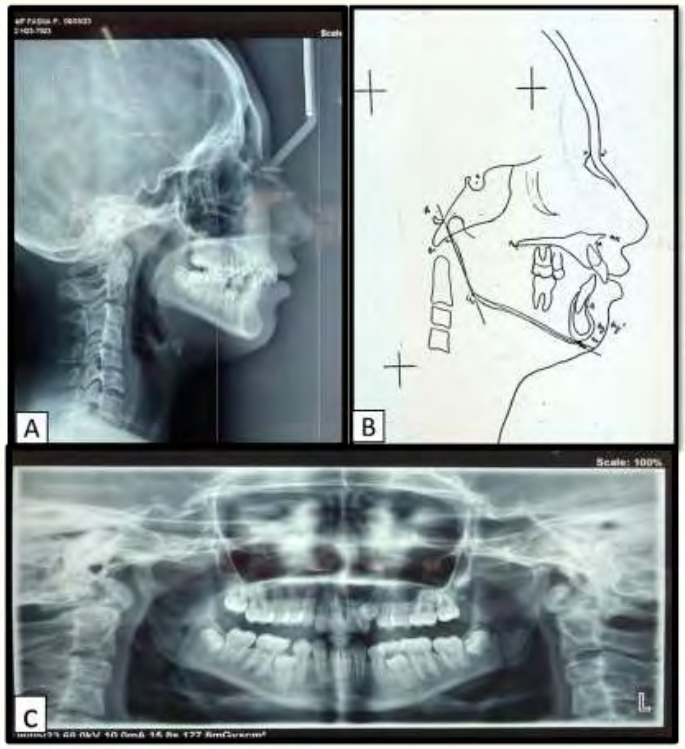

Figure 3: *A: Lateral cephalogram, B: Master tracing of the lateral cephalogram, C: Panoramic view for radiographic assessment of the impacted canine.*

According to the modification of Ericson and Kurol's classification it falls under sector III.

Treatment objectives

Bring the palatally placed left permanent canine to occlusion, de-crowding of upper and lower anteriors.

Treatment progress: The patient is having retrognathic mandible and skeletal asymmetry, the ideal treatment option would be surgical intervention. As the patient was reluctant with the idea of surgery and requested for least troublesome procedure, we had to make sure that the correction has o to be brought in with the simplest technique possible. Treatment start with fixed mechanotherapy (MBT prescription) in 0.022" X 0.28" slot started from 0.014" NiTi in upper arch and lower arch (Figure 4) followed by 0.016" NiTi and 0.017" X 0.025" Niti, 0.019" X 0.025" Niti, 0.019" X 0.025" SS in both upper and lower arch. Open coil spring was placed between 22 and 24. After creating sufficient space for 23, extraction of 63 was carried out and surgical exposure of 23 was done. After it came to the arch 0.014" NiTi

piggy back was given (Figure 5 and 6). Then 0.016" NiTi was given followed by 0.018 ss and 0.017" X 0.025" SS and then to 0.019*0.025 SS (Figure 7). Then 0.019" X .0025" SS was the canine was brought into the arch with proper tip and torque. Class-I canine relation achieved on both side of the arch. Consonant smile arc was achieved, 2 mm of overjet and 3 mm of overbite was achieved after treatment. Crowding of lower incisors was relieved with proper angulations of incisors.

Figure 4: *Upper and lower arch brackets were bonded (MBT 0.022 SLOT), 0.014 Niti archwire placed irt upper and lower arch.*

Figure 5: *0.019"X0.025" SS archwire placed irt upper and lower arch and piggy back given using 0.14 Niti on the SS archwire.*

Figure 6: *0.019" X 0.025" SS archwire placed irt upper and lower arch and piggy back given using 0.16 Niti on the SS archwire.*

Figure 7: *0.018 SS archwire placed irt upper and 0.019" X 0.025" in the lower arch.*

Figure 8: *Debonded intraoral photographs after the alignment of canine.*

Discussion

A 14 years female patient reported with left maxillary canine impaction. There was crowding in upper and lower incisors. Treatment was done in fixed mechanotherapy in MBT prescription. As surgical correction was denied by the patients parents and insisted for least traumatic procedure. Correction of crowding in the upper and lower arch achieved in the initial piggy back technique was used over all the other traction methods, and canine was guided occlusion. After the crown got exposed, it was ligated with the arch wire. Though the canine has been brought into the arch, the gingival level is not perfect. Gingivectomy could be done to established proper zenith.

The combined orthodontic-surgical approach remains a reliable method for repositioning impacted canines as highlighted by Spuntarelli., *et al*. (2016), emphasizing the importance of controlled traction and surgical exposure [6]. Several biomechanical designs, such as the ballista spring described by Raghav., *et al*. (2017), offer efficient force control and minimal tissue trauma during canine eruption [7]. Earlier investigations by McSherry (1996) and Pitt., *et al*. (2006) introduced diagnostic tools and difficulty indices that assist clinicians in evaluating treatment complexity and prognosis [8,9]. Updated clinical guidelines by Counihan., *et al*. (2013) and Seehra., *et al*. (2018) further refined diagnostic criteria and radiographic evaluation protocols for impacted canines [10]. Ericson and Kurol (1988) advocated early detection and intervention, particularly for palatally displaced canines, to reduce treatment duration and improve outcomes [11]. The integration of surgical and orthodontic management protocols proposed by Kokich and Mathews (1993) and Becker., *et al*. (2002) continues to serve as a foundation for modern management techniques [12,13]. Moreover, Coulter and Richardson (1997) quantified normal canine eruption trajectories, which assist in distinguishing physiological delay from pathological impaction [14]. Suri., *et al*. (2004) discussed the underlying pathogenesis and diagnostic nuances of delayed eruption, while Sajnani and King (2014) as well as Alhammadi., *et al*. (2018) provided prevalence data from diverse populations [15-17]. Early identification and interceptive measures described by Ngan., *et al*. (2005) and Becker and Chaushu (2015) highlighted the multifactorial etiology of impaction and importance of individualized treatment planning [18,19]. Finally, Crescini., *et al*. (2007) demonstrated that successful orthodontic alignment of impacted canines can achieve excellent periodontal health and stability when proper biomechanical control is maintained [20].

Conclusion

Palatal canine impaction was one of the difficult and challenging treatments in orthodontics. So proper diagnosis and treatment planning is necessary before starting treatment. There were lots of treatment strategies for dis-impaction.

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