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Oral Surgery

Surgical Extraction of Impacted Trans-Positioned Maxillary Canine under Local Anesthesia

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Abstract **Case Report**

The maxillary canines are important keystones in the dental arch. Any bony obstruction, insufficient bone development, crowding or resistance of the neighboring teeth such as retained primary canines, may deflect the permanent canines from their normal path of eruption. There is a great demand to retain the anterior teeth esthetically and functionally. Treatment should be based on multidisciplinary approach between orthodontic and oral surgery specialties.

Keywords: Permanent Maxillary Canines, Impaction, Transposition, Surgical extraction, Root resorption, Orthodontic Treatment, Diastema.

INTRODUCTION

Dental Transposition and impaction are anomalies related to ectopic eruption or failure in tooth eruption [1]. Transposition is a rare dental anomaly; defined as an interchange in the position of 2 adjacent permanent teeth on the same side of the arch [2]. Canines are the mostly to be transposed with ectopic eruption mesial to the lateral incisor in 20% of the cases, or distal to the first premolar in 80% of the cases [3, 4]. This anomaly affects both genders, but reports had shown a higher prevalence among female patients [5]. It generally occurs more in the maxillary arch than the mandibular, and it is often associated with other developmental anomalies of teeth; as peg laterals, congenitally missing teeth, or retained primary canines [6, 7]. It is considered real or complete; when it is in a fully exchanged position in the dental arch, and its roots are parallel to other teeth. Incomplete transposition: is when teeth involved are not in fully exchanged positions (teeth crowns overlap each other but root apices in their respective normal position) [8-10].

Transpositions were classified according to Peck and Peck as [11]:

1. Maxillary canine-first premolar (Mx.C.P1)
2. Maxillary canine-lateral incisor (Mx.C.I2)
3. Maxillary canine to first molar site (Mx.C to M1)
4. Maxillary lateral incisor-central incisor (Mx.I2.I1)
5. Maxillary canine to central incisor site (Mx.C to I1)
6. Mandibular lateral incisor-canine (Mnd.I2.C)

Impaction is a condition in which complete tooth eruption is hampered by contact with another tooth [12]. It is characterized by dental absence in the arch after its usual period of eruption [12]. Impaction is twice as common in females [14], mostly affecting lower third molars, upper canines and upper third molars, upper and lower second premolars and upper central incisors [15].

Based on literature data, the incidence of maxillary canine impaction is 1-3% [16-19]. Palatal impaction is the predominant of an 85% percent [20]. Tooth transposition is a relatively rare phenomena with a prevalence of 0.33% [21]. Unilateral canine transposition occurs more frequently (79%), being more to be found on the left side (69%) [22-24].

Early diagnosis of transposition in tooth development and impaction is essential as it influence the prognosis. Retention of impacted maxillary canines carries a higher risk of root resorption of the incisors' roots. Szarmach I. *et al*., (2006) reported spontaneous caused by abnormal tooth position in 4.9% of permanent maxillary lateral incisors in their study [25]. Ericson and Kurol have demonstrated the necessity to take x-ray pictures not later than at the age of 10 to

supplement the clinical examination whenever resorption is suspected [26, 27]. Heins and Wieder have found that the spongy bone disappears when the interval between the roots is smaller than 0.5 mm and then teeth get in a direct contact [28]. Shafer *et al*., Observed permanent incisor root resorption caused by ectopic eruption of maxillary canines in 0.71% of children aged 10-13 years. This complication has irreversible sequels, including tooth loss [29]. Ericson and Kurol had demonstrated that the ectopic eruption itself does not increase the risk of resorption. Other predisposing factors that may induce this process include mesial position of canine crown, advanced development of canine, increased mesial ectopic eruption pathway above 25 degrees as compared to the median osseous line and age of 11-12 years [26, 27].

Treatment is based on multidisciplinary approach between orthodontic and oral surgery specialties. In cases of late diagnosis, orthodontic planning interferes not only in the decision of extracting impacted or transposed teeth, but also in the correction of the order of tooth position [8, 9, 29].

The objective of this paper is to report a surgical extraction of impacted transposition maxillary left canine in adult male patient.

CASE REPORT

A 39-year-old male referred to oral surgery clinic by his orthodontist. Patient complaint was the diastema between the upper central incisors.

The patient was diagnosed with impacted transposed maxillary left permanent canine, with a retained primary canine, who had already started orthodontic treatment. As this transposition is complete, repositioning the teeth in their normal positions is complex and may be damaging to the teeth or supporting structures. Based on the orthodontist treatment plan, surgical extraction was decided for the impacted canine.

Figure 1 shows the preoperative OPG taken for the patient. Leaving impacted canines may result in serious complications, such as: displacement of the adjacent teeth, shortening of the dental arch, internal resorption, and formation of dentigerous cyst, external resorption of the canine or adjacent teeth roots, recurrent infections or combination of these listed complications. To avoid any of these sequalae, and based on the orthodontist treatment plan, surgical extraction was planed.

Figure 1: Preoperative OPG

Figure 2: Postoperative follow up

Based on further x-rays (CBCT), it was confirmed that the tooth was in buccal position. Two carpules of local anesthesia Ubistesin Forte (Articaine 4%, 1:100000 epinephrine) were used to achieve a

profound anesthesia. Semilunar mucoperiosteal flap of 3 cm length was opened buccally. Buccal alveolar bone was removed, using round bur, with extra caution taken to avoid nasal floor perforation. Tooth luxation was done using elevators. Due to the buccal bulge of the canine crown, decoronation was done, then the root of the tooth extracted using root tip elevator. Extraction site irrigated well then flap was repositioned and sutured with resorbable sutures (coated Vicryl 4.0). Patient education and post operative instruction given, and informed to keep a meticulous oral hygiene. Diclofenac Sodium 75mg IM. And Dexamethasone 4 mg IM. Ordered and oral Antibiotic prescribed.

Patient came after 1 day of the surgery for dressing; he reported no post operative pain and no swellings. He was seen after 2 weeks for suture removal.

Figure 2 shows the 6 months follow up OPG, with a complete healing and a good progress in his orthodontic treatment.

DISCUSSION AND CONCLUSION

The maxillary canines are important keystones in the dental arch. Maxillary canines develop high in the maxilla and are the last to be erupting into the oral cavity [30]. Any bony obstruction, insufficient bone development, crowding or resistance of the neighboring teeth such as retained primary canines, may deflect the permanent canines from their normal path of eruption [2]. Because there is a high probability that palatal impacted maxillary canines may occur with other dental anomalies, the clinician should be alert to this possibility [31]. There is a great demand to retain the anterior teeth esthetically and functionally. Methods of diagnosis that may allow for early detection and prevention should include a family history, visual and tactile examinations by the age of 9 to 10 years and a thorough radiographic assessment [32]. Early diagnosis is the key to avoid any complications to emerge, keeping in mind that resorption of lateral incisor root progress rapidly and in unpredictable way.

Treatment should be based on multidisciplinary approach between orthodontic and oral surgery specialties, based on the complexity of each case. Treatment options in case of transposition include alignment of the involved teeth in their transposed positions, extraction of one of the transposed teeth, or a complete orthodontic correction to their normal anatomic positions [2]. When a transposition is complete as in this case, repositioning the teeth in their normal positions is complex and may be damaging to the teeth or supporting structures. Multiple factors such as the position of the root apices, dental and facial esthetics, acceptable occlusion, patient age, motivation, expected compliance and the extra length of treatment time should be carefully considered in deciding upon treatment options. Hence in the case of complete transpositions, alignment of the teeth in their transposed positions with reshaping of their incisal surfaces will give an acceptable esthetic result [2].

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