

CANINE TRANSMIGRATION: OUSTING THE DEVIATED TOOTHSakshi Singh^{1*}, Naveen Manuja², Karishma Gautam³ and Priyanka Biswas⁴^{1,4}Post Graduate Student, Department of Pediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh, India.²Professor, Department of Pediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh, India.³Senior Lecturer, Department of Pediatric and Preventive Dentistry, Hazaribag College of Dental Sciences and Hospital, Hazaribag, Jharkhand, India.***Corresponding Author: Dr. Sakshi Singh**

Post Graduate Student, Department of Pediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh, India.

Article Received on 28/02/2023

Article Revised on 10/03/2023

Article Accepted on 30/03/2023

ABSTRACT

Transmigration is a rare pre-eruptive phenomenon in which intraosseous migration of tooth takes place across the midline. These teeth usually remain impacted and asymptomatic but some may erupt ectopically either in midline or next to contralateral side. Transmigrated teeth can cause resorption of the adjacent teeth. The current case report depicts the management of transmigrated and impacted permanent left mandibular canine in a 11-year-old girl. On intraoral examination, primary mandibular central incisors were retained. The orthopantomogram revealed an impacted permanent left mandibular canine migrated toward the midline and located below the apices of the retained primary mandibular central incisors and permanent mandibular central incisors were congenitally missing. The treatment opted was extraction of retained primary mandibular central incisors followed by surgical exposure of impacted left mandibular permanent canine and its orthodontic extrusion with the aim to achieve proper alignment, function and aesthetics.

KEYWORDS: Canine transmigration, Orthodontic extrusion, Retained teeth, Congenitally missing.**INTRODUCTION**

An impacted tooth is a tooth that fails to erupt into the oral cavity after completion of normal developmental pattern. The prevalence rate of impacted third molars is highest that is 16.7%-68.6% whereas, maxillary canine impaction is 0.9-2.2%. However, the impaction of the mandibular canine is less frequent, and the prevalence rate ranges 0.05-0.4%.^[1] Mandibular canine impaction, translocation and in particular, transmigration is rare. In transmigration, mandibular left side is more often affected than the right side.^[2]

Intraosseous migration of unerupted teeth across the midline is a rare phenomenon known as dental transmigration. Ando et al. in 1964 coined the term transmigration.^[3] Tarsitano et al. defined transmigration as a phenomenon of the movement of unerupted canine through the midline.^[4] A canine is categorised to be as transmigrated when more than half of its length has crossed the midline. Transmigrated tooth may either remain impacted and asymptomatic or can lead to resorption of roots of adjacent teeth, pain and discomfort.^[5]

This case report highlights the surgical exposure of the transmigrated permanent canine followed by orthodontic extrusion of the same to its proper alignment in the arch.

CASE REPORT

An 11-year-old female patient came to the Department of Pedodontics & Preventive Dentistry with the chief complaint of smaller teeth in the lower front teeth region since 3-4 years. On intra-oral examination, it was revealed that the primary mandibular central incisors were retained. On radiographic examination, it was revealed that there was ectopic eruption of the lower left permanent canine with its crown almost overlapping the root of the retained primary mandibular central incisor. Moreover, the permanent central incisors were congenitally missing [Figure 1].



Figure 1

Since, the root formation of the canine had almost been completed and there was less possibility for the tooth to erupt on its own. So, the treatment plan was to extract the retained primary mandibular central incisor and to expose the impacted permanent mandibular canine surgically followed by its orthodontic extrusion to the occlusal level and its alignment in the dental arch. Initially, the extraction of the retained primary mandibular molars was done, followed by placement of the lingual holding arch space maintainer so that the mesial migration of the permanent molars can be prevented and the integrity of the arch is maintained [Figure 2 A].

After one month, the surgical treatment was planned. The MBT orthodontic brackets were bonded to the right lateral incisor, right canine and the left lateral incisor

followed by the extraction of the retained primary central incisors under local anesthesia. Further, the muco-periosteal flap was reflected just enough to expose the impacted canine [Figure 2 B]. The exposed crown of impacted canine was etched, bonded and an orthodontic bracket was placed under proper isolation to aid in the extrusion of the same. The 0.009 ligature wire was wrapped around the bracket placed on the impacted mandibular canine [Figure 2 C]. The flap was repositioned and interrupted sutures were placed. A 0.014" arch wire was placed on the brackets placed from the right lateral incisor to the left. Orthodontic force was applied as the ligature wire was pulled and upward traction was applied to the canine and tied to the 19-gauge stainless steel wire of the lingual arch space maintainer and the 0.014" main arch wire [Figure 2 D].

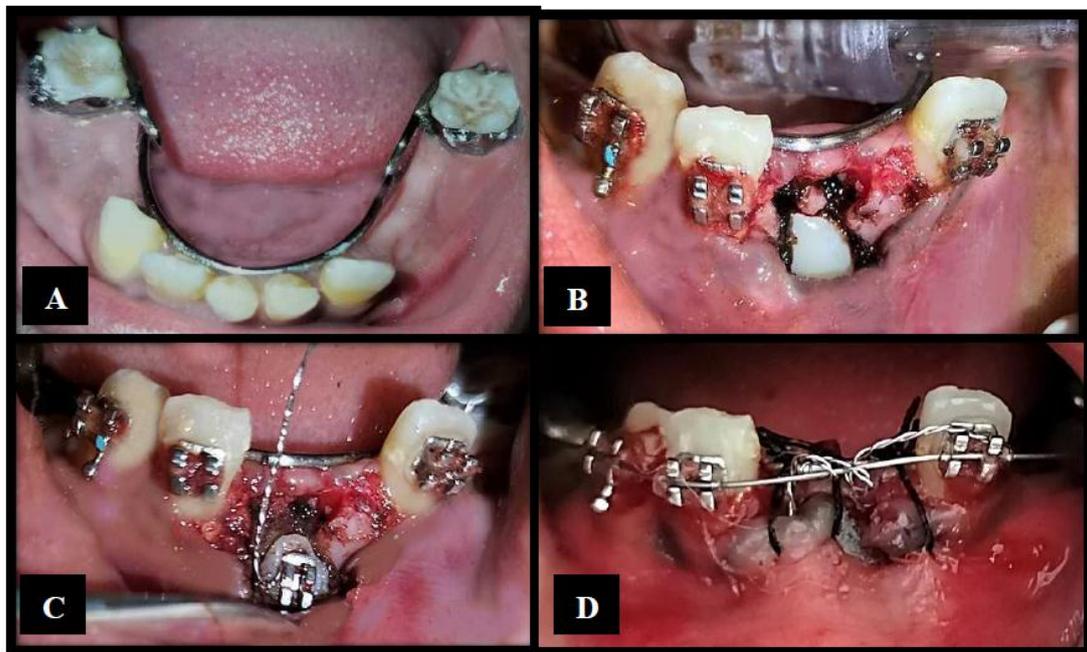


Figure 2

Figure 2 A: Lingual holding arch space maintainer.

Figure 2 B: Bracket placement and surgical exposure of impacted canine.

Figure 2 C: Placement of ligature wire to the bracket on the impacted canine.

Figure 2 D: Suture Placement and ligature wire anchored to the main arch wire.

Post-surgical instructions were given and necessary antibiotics and analgesics were prescribed. Patient was recalled after a week for suture removal. An uneventful healing was observed at recall visit and sutures were removed after 7 days. The clinical and radiographic evaluation was done monthly over the next 4 months to check the progress of the canine eruption. The ligature wire was tightened monthly on every visit. Once sufficiently erupted, the crown of the impacted canine was rebonded with a canine bracket and the 0.017" main

arch wire was placed [Figure 3 (A, B)]. After 2 months of placing the 0.017" arch wire, the canine erupted into the occlusion and the arch wire was secured with the elastic modules [Figure 3 (C, D)]. The canine was reshaped into the central incisor due to the position in which it was extruded orthodontically [Figure 3 E]. and the orthodontic brackets were bonded to the erupted permanent teeth in the lower arch [Figure 3 F]. The patient is kept on follow up for the further orthodontic treatment proceedings.

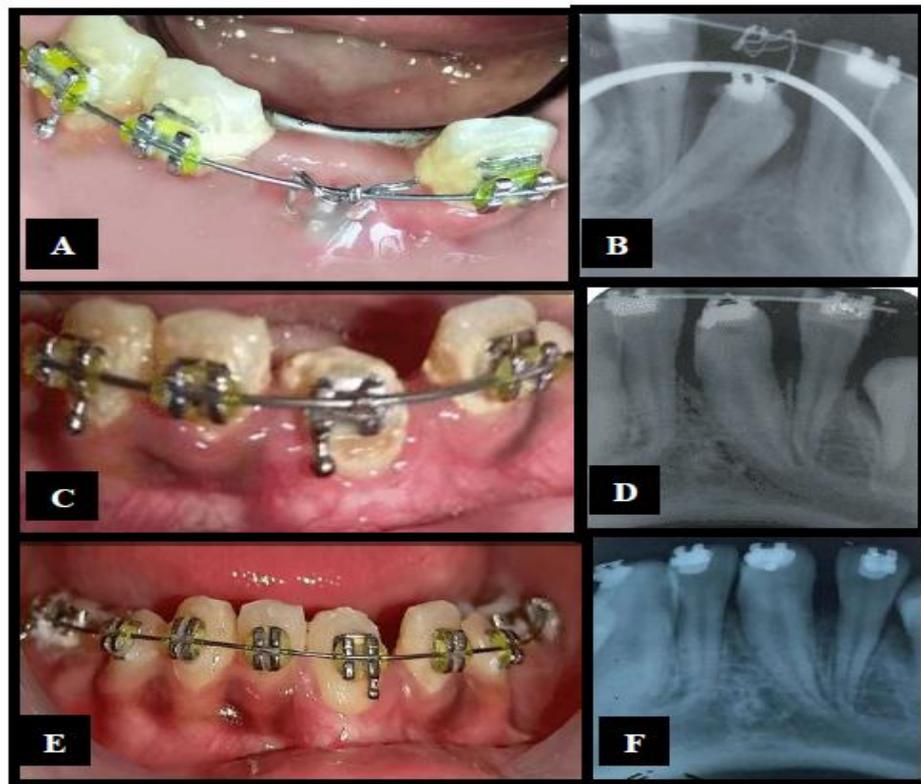


Figure 3

Figure 3 (A, B): Follow up after 4 months (clinical & radiographic)

Figure 3 (C, D): Follow up after 6 months (clinical & radiographic)

Figure 3 (E): Canine eruption to the occlusal level followed by bracket placement for further orthodontic treatment.

Figure 3 (F): Canine eruption to the occlusal level (radiographic).

DISCUSSION

The canine plays important functional and aesthetic roles in humans, and altered eruption of these teeth is an important patient concern. Transmigration of an unerupted tooth is generally a unilateral phenomenon with left canine affected more than right canines.^[6]

Mupparapu^[7] classified transmigrated mandibular canines into five types [Figure 4]:

Type 1: Canine impacted mesio-angularly across midline, labial, or lingual to anterior teeth with crown portion of tooth crossing midline.

Type 2: Canine horizontally impacted near the inferior border of the mandible below the apices of the incisors.

Type 3: Canine erupted either mesial or distal to opposite canine.

Type 4: Canine horizontally impacted near the inferior border of mandible below apices of premolar or molar on the opposite side.

Type 5: Canine positioned vertically in the middle with long axis of tooth crossing midline.

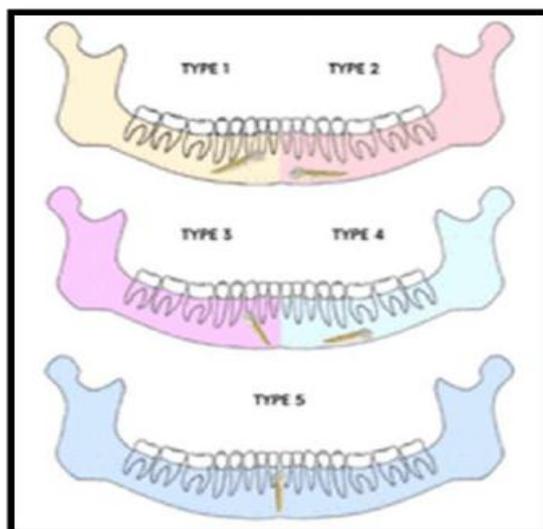


Figure 4.

The incidence of these types varies with Type 1 (45.6%) being the most common, followed by Type 2 (20%), Type 4 (17%), Type 3 (14%), and Type 5 (1.5%).

The various etiological factors of transmigration are the displacement of the dental lamina to an abnormal position in early life resulting in an abnormal eruptive path, distant migration in the developmental stage of the tooth apex due to rich blood circulation and active alveolar bone formation, congenitally missing lateral or central incisors, cystic lesions of the canine, prematurely lost or over retained deciduous teeth, tooth size arch length discrepancies.^[5] In the case reported by Kaufman and Buchner, migration was due to ectopic growth of the bud, which developed buccally and thus permitted the tooth to migrate without disturbance.^[8] Wertz utilized orthodontic treatment to bring labially impacted transmigrated canine into position.^[9] An orthodontic treatment should restore the correct occlusion and provide good and favourable facial aesthetics, hence maintaining the health of tooth supporting structures including the periodontium.^[10] The treatment options for the correction of impacted mandibular canines available are surgical removal, exposure and orthodontic alignment, transplantation. If adequate space for alignment of an impacted tooth exists and if mechanically possible, it is repositioned into proper position through the orthodontic treatment. Following surgical exposure, the impacted tooth has a favourable angulation then it is allowed to erupt passively. Whereas, if the angulation and direction of the impacted tooth is unfavourable then forced eruption may be carried out in concurrence with orthodontic alignment. If an impacted tooth cannot be positioned favourably to its original desired position in the arch but there is space for its complete eruption, then orthodontic treatment helps in the alignment of the adjacent teeth in their migrated order followed by recontouring of teeth for better aesthetics.^[4] This was the scenario in the present case, as the permanent mandibular central incisors were

congenitally missing, hence there was space for the transmigrated mandibular canine to be orthodontically extruded into the position of the central incisors. Orthodontic treatment is associated with soft and hard tissue changes, thus it is of paramount importance to maintain the gingival and periodontal health to ensure optimal results. In case of favourable root developmental stage, orthodontic traction is planned so as to obtain ideal function and aesthetics through correct positioning of the impacted canine. Orthodontic traction is more difficult and complicated, although it is the most efficient strategy to restore physiological occlusion.^[1] However, sometimes a multidisciplinary clinical approach is rendered necessary, to fulfil the treatment needs.

CONCLUSION

Although inclusion and transmigration of mandibular canines is a rare clinical condition, it is necessary to shed light on the diagnosis and most predictable treatment options to enable clinicians to meticulously carry out effective treatment protocols within the biological limits. The most common treatment strategies are surgical extraction and orthodontic traction for impacted mandibular canines, surgical extraction, and radiographic monitoring for transmigrant mandibular canines. In this case report, successful orthodontic extrusion of impacted transmigrated permanent mandibular canine is achieved with good aesthetic results.

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