

Case report

Concomitant occurrence of canine transmigration and symmetrical agenesis of incisors – A case report

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Abstract

Transmigration of mandibular canine is an unusual phenomenon characterized by movement of the impacted canine crossing the mandibular midline. Mandibular canine are rarely found impacted in a horizontal position in the mandible. Most of the time, this entity occurred as an isolated finding. However there are reports showing association of dentigerous cyst and a hyperdontia. The purpose of this report is to present a case of transmigrated canine associated with agenesis of mandibular both central incisors which is not reported previously.

Key words: Intra-osseous migration, mandibular canine, agenesis; central incisors.

Introduction

Impaction of canine in mandible is rarer than the maxillary canine and it is even rarer phenomenon when such an impacted mandibular canine migrated to the other side of the mandible, crossing the mandibular midline. The term 'transmigration' is referred to pre-eruptive movement of a tooth across the midline.¹ Exact etiology for the pathogenesis of transmigration of mandibular canine is not well documented in the literature.

The most commonly missing permanent teeth are third molars, mandibular second premolar and maxillary lateral incisor.² Literature shows reports of unilateral occurrence of permanent mandibular central incisors.³ But congenital agenesis of both right and left mandibular central incisors is not mentioned thoroughly.

Transmigration associated with other anomalies like supplemental mandibular premolar,⁴ odontoma⁵ and pathology like dentigerous cyst⁶ have been reported. But transmigrated mandibular canine associated with bilateral agenesis of permanent lower central incisors is reported previously. The

present article reports such a case of rare combination.

Case report

A 12-year-old male patient reported for regular dental check up. On intraoral examination, patient exhibited mixed dentition with anterior cross bite. Retained primary mandibular right and left central incisors with grade I mobility was observed. Permanent both central incisors were missing clinically (Figure 1). Other permanent teeth like maxillary centrals, laterals, canines, mandibular laterals and left canine had already erupted. To rule out agenesis of permanent central incisors periapical radiograph was taken which confirmed the agenesis of permanent both central incisors (Figure 2). It also showed mesially migrated permanent left canine with crown crossing the dental midline. The crown of migrated canine was covered by ill defined cyst like radiolucency lined with radiopaque line. To know its extension, occlusal radiograph was taken which showed radiolucency confined only to the crown (Figure 3). Based on the literature search this condition was diagnosed as intra-alveolar

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transmigration of canine associated with agenesis of central incisors. On the contralateral side the permanent canine was in normal eruption path. Unfortunately patient did not turn up for the next appointment.



Figure 1: Intra oral photograph showing retained both central incisors



Figure 2: Periapical radiograph showing agenesis of both central incisors, transmigrated left canine

Discussion

The present report describes the unusual association of two infrequent dental anomalies: 1) a transmigrated permanent mandibular left

canine and 2) congenital symmetrical agenesis of mandibular central incisors.



Figure 3: Occlusal radiograph of the transmigrated canine

Although specific etiology of transmigration anomaly is not known, various factors like traumatic factors, hereditary, the long eruption path of canine tooth germs, premature loss of primary tooth, filling of this space by an adjacent tooth, disharmony of tooth-size, unfavorable alveolar arch length, and over length of crowns have been reported as causative factors.^{7,8}

Mupparapul has given a classification for transmigrated canines based on their migratory pattern and their position in the jaw as follows.

Type 1: The canine is impacted mesioangularly across the midline, labial or lingual to the

anterior teeth with the crown portion of the tooth crossing the midline.

Type 2: The canine is horizontally impacted near the inferior border of the mandible below the apices of the incisors.

Type 3: The canine has erupted either mesial or distal to the opposite canine.

Type 4: The canine is horizontally impacted near the inferior border of the mandible below the apices of either premolars or molars on the opposite side.

Type 5: The canine is positioned vertically in the midline with the long axis of the tooth crossing the midline.

Based on this classification the transmigrated canine of the present case was categorized as type 1 transmigration.

The incidence of transmigrated canines is much higher in females than in males. The left canine is more involved than the right canine.¹ In the present case also the left canine was transmigrated than the right canine but in a male patient.

According to Shapira and Kufninec⁹ an impacted canine that has crossed the midline more than half of its length should be considered as transmigrated. However, Joshi⁷ reported that the tendency of a canine to cross the barrier of the mandibular midline suture is a more important consideration than the distance of migration after crossing the midline. Canine usually migrate mesially. They are often horizontal and can migrate anteriorly, some crossing the midline, but semi-horizontal transmigrant canines have also been reported.⁷ In the case reported here the impacted canine was in semihorizontal position or semihorizontally migrated.

Newman in 1967¹⁰ was the first to describe congenital missing of two mandibular incisors. Various authors have stated that missing mandibular incisors is common in certain populations like Korean, Japanese and Chinese.^{2,11} The etiology of agenesis of bilateral central incisors is still unknown. Literature shows several factors like radiation, trauma, and infection, idiopathic and metabolic disorders as the possible causative factors.¹² Recent data suggested that interaction of particular genes like TGFA, MSX1 and PAX9 play a major role in agenesis of teeth in humans.¹³

Very strong correlation between agenesis of primary teeth and agenesis of permanent teeth has been shown by various investigators. Grahnen and Granath in 1961¹⁴ reported concurrent agenesis of both primary and permanent mandibular four incisors. But in the case presented here this finding was not observed.

One more interesting feature observed in the present case was cyst type lesion covering the crown of the transmigrated canine. There are reports showing relationship between the development of both transmigration as well as dentigerous cyst.^{6,8} However, radiographic distinction between a small dentigerous cyst and an enlarged follicle out the crown of an unerupted tooth is difficult and may be largely on academic exercise. For the lesion to be considered a dentigerous cyst, some investigators believe that the radiolucent space surrounding the tooth crown should be at least 3-4mm in diameter.⁶ As dentigerous cyst may severely displace the associated teeth, cystic pressure might cause the transmigration of canine. However some authors have not supported this possible etiology.¹ One more important factor is that it may not be possible to decide whether the tooth was transmigrated before the pathological process develops or not. Radiographic findings of our case are not diagnostic for a dentigerous cyst. Therefore the lesion was diagnosed as a tooth follicle.

It seems that retained deciduous incisors exceeding normal exfoliation time or space in anterior region, emphasizes the radiographic protocol in each child patient having retained deciduous teeth or abnormal spacing for early diagnosis and better intervention.

References

1. Mupparapu M. Patterns of intra-osseous transmigration and ectopic eruption of mandibular canines: review of literature and report of nine additional cases.
2. Backman B, Wahlin YB. Variations in number and morphology of permanent teeth in 7-year-old Swedish children. *Int J Paediatr Dent* 2001;11(1):11-17. [doi:10.1046/j.1365-263x.2001.00205.x](https://doi.org/10.1046/j.1365-263x.2001.00205.x).
3. Newman GV, Newman RA. Report of four familial cases with congenitally missing mandibular incisors. *Am J Orthod Dentofac Orthop* 1998; 114: 195-207. [doi:10.1053/od.1998.v114.a87015](https://doi.org/10.1053/od.1998.v114.a87015). PMID:9714285.
4. Camilleri S. Double transmigration and hyperdontia. *Angle Orthod* 2007; 77(4): 742-4. [doi:10.2319/071006-285](https://doi.org/10.2319/071006-285). PMID:17605496.
5. O'Carroll MK. Transmigration of the mandibular right canine with development of odontoma in its place. *Oral Surg Oral Med Oral Pathol* 1984; 57(3): 349. [doi:10.1016/0030-4220\(84\)90194-4](https://doi.org/10.1016/0030-4220(84)90194-4).
6. Buyukkurt MC, Aras MH, Caglaroglu M. Extraoral removal of a transmigrant mandibular canine associated with a dentigerous cyst. *Quintessence Int* 2008; 39(9): 767-70. PMID:19093050.
7. Joshi MR. Transmigrant mandibular canines: A record of 28 cases and a retrospective review of the literature. *Angle Orthod* 2001;71:12-22. PMID:11211293.
8. Aydin U, Yilmaz HH. Transmigration of impacted canines. *Dentomaxillofac Radiol* 2003;32:198-200. [doi:10.1259/dmfr/38819077](https://doi.org/10.1259/dmfr/38819077).
9. Shapira Y, Kuftnec MM. Unusual introsseous transmigration of a palatally impacted canine. *Am J Orthod Dentofac Orthop* 2005;127:360-3. [doi:10.1016/j.ajodo.2004.04.018](https://doi.org/10.1016/j.ajodo.2004.04.018). PMID:15775953.
10. Newman GV. Congenitally missing mandibular incisors: treatment procedures. *Am J Orthod* 1967; 5: 489-491.
11. Davis PJ. Hypodontia and hyperdontia of permanent teeth in Hong Kong schoolchildren. *Community Dent Oral Epidemiol* 1987; 15: 218-220. [doi:10.1111/j.1600-0528.1987.tb00524.x](https://doi.org/10.1111/j.1600-0528.1987.tb00524.x). PMID:3476247.
12. Endo T, Ozoe R, Kubota M, Akiyama M, Shimmoka S. A survey of hypodontia in Japanese orthodontic patients. *Am J Orthod Dentofac Orthop* 2006; 129: 29-35. [doi:10.1016/j.ajodo.2004.09.024](https://doi.org/10.1016/j.ajodo.2004.09.024). PMID:16443475.
13. Vieira AR, Meira R, Modesto A, Murray JC. MSX1, PAX9, and TGFA contribute to tooth agenesis in humans. *J Dent Res* 2004; 83: 723-727. [doi:10.1177/154405910408300913](https://doi.org/10.1177/154405910408300913). PMID:15329380.
14. Grahnen H, Granath LE. Numerical variations in primary dentition and their correlation with the permanent dentition. *Odont Rev* 1961; 12: 348-357.