

A RARE CASE REPORT OF BILATERAL MAXILLARY CANINE – FIRST PREMOLAR-TRANSPOSITION

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Case Report

ABSTRACT

Tooth transposition is a rare developmental anomaly affecting less than 1% of the population. The permanent maxillary canine and 1st premolar are the most commonly affected teeth. Bilateral maxillary canine-1st premolar transpositions are extremely rare with only a handful of cases being reported in the literature. We report one such case of bilateral maxillary canine-1st premolar transposition in a 28 year old Malaysian female which was associated with other dental anomalies.

Key words: Tooth transposition; dental anomaly; bilateral; maxillary canine-1st premolar.

INTRODUCTION

Tooth transposition is a rare developmental anomaly of positional interchange of two adjacent teeth of the same quadrant in the dental arch (1). It is known to be a rare occurrence affecting less than 1% of the population, with maxillary dentition being frequently affected than mandibular dentition (2-5). The permanent maxillary canine is a tooth most frequently involved in the transposition. It shows the highest incidence of transposition with first premolar affecting nearly 0.13% of the population, representing 71% to 89.2% of the cases observed in the maxillary dentition (6-8). This is followed by canine transposition with the lateral incisor, rarely with central incisor, and extremely rarely with second premolar or first molar (1). In the mandibular arch, though rare, transpositions of lateral incisor and canine have been observed (7, 9).

Transposition may be complete or incomplete. Complete transposition involves both the crown and entire root of the involved tooth in transposed malposition, whereas incomplete transposition involves the crown being transposed but root apex remaining in a relatively normal position (3, 6, 10, 11). Most studies have revealed a higher prevalence in females while a very few studies have reported a higher male prevalence (12). Unilateral transposition is more prevalent and the left side is the most affected with transposition of maxillary canine and 1st premolar (1, 10, 13). Bilateral transposition is a very rare occurrence with only a handful of cases being reported in the

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dental literature. We report a case of bilateral transposition in a Malaysian patient.

CASE REPORT

A 28 year old Malaysian female reported to the Oral Medicine clinic of Penang International Dental College for routine dental check up. The patient was apparently healthy with no known medical conditions. Intra-oral examination showed bilateral retained deciduous maxillary canines and retained maxillary deciduous lateral incisor on the right side. Along with this there was a rare finding of bilateral transpositions of permanent maxillary canines with the first premolars. The maxillary permanent left lateral incisor was peg shaped. Radiographic examination revealed that the right permanent lateral incisor was congenitally missing (Figure 1, 2 & 3). The patient was advised to undergo orthodontic as well as aesthetic treatment for her dental condition.

DISCUSSION

Tooth transposition is a relatively rare clinical presentation. It has been described as a positional interchange of two adjacent teeth, or the development or eruption of a tooth in a position normally occupied by a non-adjacent tooth (14, 15). The maxillary permanent canine is reported to be the most commonly transposed tooth. When displaced mesially or distally, an ectopically erupting canine may become transposed with one of the adjacent teeth (10).

Miel (1817), a French Dentist, was apparently the first to describe the maxillary canine-premolar transposition anomaly in detail (16). Several theories



Figure 1. Picture showing transposition of bilateral maxillary canines and 1st premolars along with bilateral retained deciduous canines and retained maxillary deciduous lateral incisor on the right side.

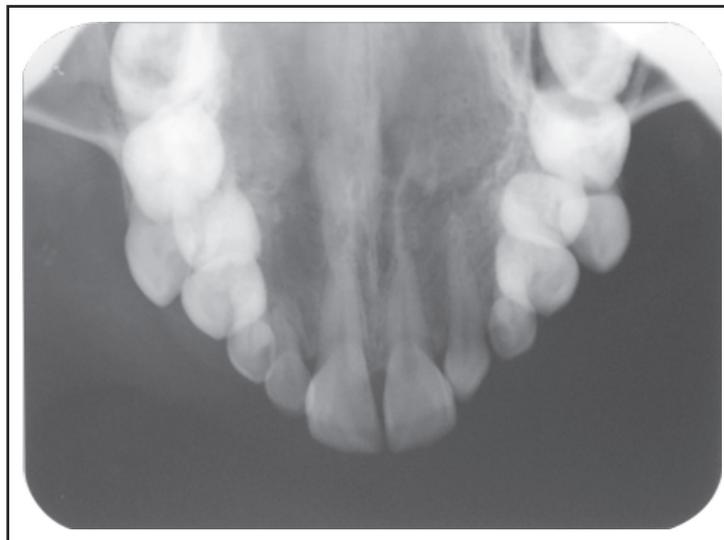


Figure 2. Occlusal view showing missing maxillary right permanent lateral incisor.



Figure 3. Panoramic radiograph.

have been proposed to explain the phenomenon of tooth transposition such as multifactorial genetic factors, an interchange in the position of the developing dental lamina of the involved teeth and even trauma to the deciduous teeth with dilaceration of the permanent incisor root, but none confirm the etiology (10, 12, 14, 17, 18). One such theory suggested that retained deciduous canines, observed in a large number of canine transpositions, might be the primary cause for the displacement and migration of the permanent canine from its normal path of eruption. This migration theory serves to explain the present case. Other causes of tooth transposition include trauma, mechanical interference, bone disease, tumours and cysts (1, 17).

Following a Multifactorial hereditary model, Peck *et al.* (14) and Ely *et al.* (19) suggested that transposition of maxillary canine and first premolar is genetically controlled and also the environment plays a role. This conclusion was reached because of the moderate rate of bilateral occurrence, increased prevalence of additional dental anomalies, occurrence following a hereditary pattern and varying prevalence among populations (10, 19, 20). Our case however, did not have any family history of similar anomaly.

Maxillary transpositions show predominance over the mandibular ones which may be due to the high density of bone in the mandible which might prohibit tooth transposition (21). Transposition in the maxilla may be more common, especially in the case of canines due to their long path of eruption (22).

Transposition is often accompanied by other congenital dental anomalies such as hypodontia, peg shaped or small maxillary lateral incisor, retained deciduous teeth, severe rotations and malposition (10). Our case also showed a congenitally missing permanent lateral incisor and a retained deciduous lateral incisor on the left side and bilateral retained deciduous canines along with a peg shaped permanent lateral incisor on the right side of the maxillary arch.

Budai *et al.* reported the simultaneous occurrence of tooth transposition and dental anomalies as follows: tooth transposition and agenesis in 40% of the cases, tooth transposition and conoid lateral incisor in 25% of the cases and tooth transposition and retention of deciduous teeth in 50% of the cases (6).

Transpositions were classified by Peck and Peck (9) as follows:

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

Very few cases of bilateral maxillary canine-1st premolar transposition have been reported in literature. Many of these cases have been reported in mixed dentition and have been corrected orthodontically. Studies by Peck *et al.* (14), and Chattopadhyay and Srinivas (1996) (12) found high numbers of bilateral transposition cases (20%) in contrast to low number of bilateral cases (7.5%) seen by Joshi and Bhatt (23). Bilateral transpositions involves same pair of teeth on both sides, no case has been reported where different pairs were transposed on either side (12).

Various treatment options have been suggested regarding transposed canines. Early treatment may lead to fewer soft tissue injuries (1). The treatment options that have been suggested for bilaterally transposed teeth include alignment of the teeth in their transposed position, extraction of one or both transposed teeth, and orthodontic movement into the normal arch positions (1). In the present case, the patient was given an option of extraction of bilateral maxillary deciduous canines, maxillary right deciduous lateral incisor and bilateral maxillary permanent 1st premolars, thereby creating space for orthodontic movement of the permanent canines into position. However the patient failed to report for the management.

Orthodontic treatment planning curtails major decisions about extraction of the transposed teeth and also the order of correction of the transposed teeth. Keeping in mind the occlusion, aesthetics, periodontal support and patient's age, correction of transposed teeth can be achieved successfully.

CONCLUSION

Transposition is an easily recognizable tooth anomaly which can be diagnosed on routine examination. Bilateral maxillary canine-1st premolar transpositions are very rare occurrence. Studies to quote the prevalence of transposition amongst South-East Asian population are very few. This report contributes to the volume of rare dental anomalies which may help future research in this area.

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