

Bilateral transposition – a rare case with a literature review

Bilateral transposition of maxillary canines and first premolars

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ABSTRACT

Transposition is an interchange in the position of two adjacent teeth in the same quadrant of the dental arch. It is a rare occurrence, especially in bilateral cases, which was seen in our case. There are different types of transpositions that are classified on the basis of the tooth involved. It should be recorded in the dental records of a person as it may be of importance in the perspective of forensic odontology. We reported this rare case of bilateral transposition of maxillary canines and first premolars along with a review of the literature.

Keywords: Transposition, maxillary, premolars, canine

ÖZ

Transpozisyon aynı diş arki kuadranındaki iki komşu dişin pozisyonundaki değişikliktir. Bizim vakamızda da olduğu gibi, özellikle bilateral vakalarda nadir görülen bir durumdur. Transpozisyonların dişe göre sınıflandırılan farklı türleri vardır. Adli tıp odontolojisi açısından önemli olabileceğinden bir kişinin dental kayıtları tutulmalıdır. Bu yazıda nadir bir maksiller kaninler ve birinci premolar dişlerin bilateral transpozisyonu vakası literatür eşliğinde sunulmuştur.

Anahtar kelimeler: Transpozisyon, maksiller, premolar dişler, kanin

INTRODUCTION

An interchange in the position of two adjacent teeth in the same quadrant of the dental arch is referred to by the term transposition. This unusual occurrence has been observed and has also been reported since the 19th century (1). It is a rare developmental dental anomaly whose origin is unknown (2). Peck et al. (3) has defined transposition as an interchange in the position between two adjacent teeth, especially of the roots or the development or eruption of a tooth in a position usually occupied by a nonadjacent tooth. Peck and Peck classified transposition into 5 types based on the teeth associated. They are a) Canine–First Premolar, b) Canine–Lateral Incisor, c) Lateral Incisor–Central Incisor, d) Lateral incisor–central incisor, e) Canine to Central Incisor position (4). The commonly occurring transposition is the maxillary canine and maxillary first premolar. The incidence is approximately 0.13% in the population, and this represents 71–89.2% of the maxillary cases (5, 6).

In the maxilla, the location of the tooth crypt depends upon the shape of the surrounding structures, mainly the anterior maxillary teeth. Physiologic migration of the tooth and the path of

tooth eruption are largely determined by the morphology along with the pattern of growth of local bone. The path of tooth eruption, which usually succeeds the orientation of the roots, could be influenced and changed by maxillary spaces, mechanical interferences and alterations in the growth speed (7).

In the pre-eruptive phase, the maxillary canines are in a location that is adjacent to the aperture piriformis. It is also above the location of the pre-erupted premolars. This leads to an increased possibility of the ectopic eruption of maxillary canines.(6) Transposition can be complete or incomplete. In a transposition that is complete, both the crown and root structures of the teeth involved are parallel in their transposed locations. In incomplete transposition, the crowns may be transposed, while the root apices persist in their normal locations. The crowns may also be in the correct sequence, and the root apices could be transposed (8).

CASE PRESENTATION

A 33-year-old male patient reported to the department with the chief complaint of deposits in the upper and lower teeth for 2

Figure 1. Maxillary Arch: Bilateral transposition of the maxillary canines and first premolars. Rotation of the canines was also seen along with generalized staining of teeth. The lateral incisor on the left side displays morphological changes. It is smaller in size compared to its right counterpart



Figure 2. Mandibular Arch: The mandibular arch displayed a normal sequence of teeth, and crowding was present in the lower anteriors. Stains and calculus were also seen



months. There was no relevant medical history, history of drug allergy or family history. On clinical examination, stains and calculus were present in the maxillary as well as mandibular teeth. Crowding was also present in the lower anteriors. Bilaterally, a transposition was seen with respect to the maxillary first premolars and canines (Figure 1). The mandibular arch displayed a normal sequence of teeth (Figure 2). Panoramic radiography revealed normal condylar and articular surfaces. A full complement of teeth was seen in the maxillary and mandibular arches, except for missing 28. The complete bilateral transpositions of the maxillary first premolars and canines were revealed (Figure 3)

Figure 3. Panoramic Radiograph: Complete transpositions of the maxillary first premolars and canines were revealed



Informed consent was obtained from the patient regarding publication and associated images with regard to the same.

DISCUSSION

The most frequently transposed tooth is the maxillary canine, which may be impacted palatally or labially while being displaced in the palatolabial plane. If displaced mesially or distally, an ectopic erupting canine maybe transposed with either of the adjacent teeth (8).

Bilateral transposition has been reported and compared to its unilateral counterpart, which is more frequent with respect to the left side in comparison with the right (1, 6, 9). Female predilection is usually seen, unlike our case. However, some authors have reported equal gender predilection, and some have reported male predilection (1, 9). The maxilla is more involved than the mandible (1, 4, 9). This is also in agreement with our case.

Several dental anomalies like hypodontia, retained deciduous teeth, peg shaped maxillary laterals or lateral incisors that are smaller in size than normal often accompany this condition (10). In our case, the maxillary lateral incisor was smaller in size on the left side in comparison with the right. Rotation was seen corresponding to the maxillary first premolars. Whenever transposition occurred, the involved teeth tended to display a characteristic appearance and malposition (9).

Mandibular transpositions have been reported to only involve incisors and canines (11, 12).

Transposition has not been reported in the deciduous dentition (13).

Various concepts have been put forward to describe the occurrence of transposition (9).

Maxillary Canine–Premolar transposition is currently considered to be due to genetic causes and has a pattern of multifactorial inheritance (3, 4). According to Peck and Peck (4) many observations have justified polygenic inheritance theory, such as the increased prevalence of dental anomalies and significant differences in gender predilection.

Various genetic factors, an exchange in the position of the forming dental lamina along with trauma to the deciduous tooth with the permanent incisor root dilaceration, were suggested as reasons for transposition. Retention of deciduous canines has also been implicated in canine transpositions as there might be displacement and migration of the permanent canine from its eruption path (1).

From a forensic point of view, transposition, if prevalent, should be recorded in the dental records of the patient (14).

Various treatment modalities have been discussed in the literature.

1) Interceptive treatment, if the transposition is detected earlier in life within 6–8 yrs.

Extraction of the deciduous teeth and guiding the transposed tooth into its normal location can be accomplished, while maintaining the space with space maintainers.

2) Orthodontic movement of the teeth to rectify the intra arch position.

3) Teeth alignment in their respective transposed positions is continued by reshaping the occlusal or incisal surfaces for restorative camouflage.

4) Extraction of either one or both the teeth involved followed by orthodontic alignment (15).

Since it was an incidental finding, and the patient did not have any esthetic discomfort, treatment was not considered.

CONCLUSION

Bilateral transposition of teeth is a rare occurrence. In this case, this finding should be recorded in the dental records of the patient. This could be an important finding from a forensic point of view because of the rarity of the occurrence. It can be a vital source of identification of the individual by dental records. Treatment is not really indicated unless the esthetics or the occlusion are compromised.

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