



An Unusual Dental Eruption Phenomenon – Tooth Transposition

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Abstract

Various dental anomalies or malformations or dental phenomenon can occur in human dentition and knocking the door of research quest for the answers required to hypothesize such dental variations. “Tooth Transposition” is one among that unusual dental phenomenon referring to interchange of two teeth in the same dental arch. The purpose of this article is to present a case of tooth transposition involving maxillary canine and first premolar occurring in a 19-year-old female patient belonging to Indian ethnicity.

Dear Editor-In-Chief,

A 19-year-old female patient of Indian origin reported to a private dental clinic complaining of space or gap existing in the upper right arch since many days. Patient was apparently normal having moderate built and well nourished with good behaviour. There were no any symptoms or signs associated with systemic, metabolic or syndromic diseases. There was no past history of any hospitalization or sickness. Past dental history revealed that patient underwent orthodontic treatment for the correction of this gap but unfortunately the treatment did not solve the problem. Intraoral examination was carried out which revealed complete permanent dentition with well aligned permanent teeth. A retentive wire was observed in the lingual aspect of upper and lower anterior teeth. Spacing was observed in the maxillary anterior region beside right central incisor. Permanent maxillary lateral incisor was appeared clinically missing. On contralateral side lateral incisor was present and was of conical shape (ped shaped lateral incisor). Further careful observation showed that right permanent canine was erupted and placed in the position of first premolar and first premolar was erupted in the place of canine. Past dental history revealed that there was no incident of any previous extraction of lateral incisor tooth. There was no history of trauma and complete loss of a tooth in the upper anterior region. To rule out the congenital agenesis of lateral incisor, patient was subjected to radiographic examination. Radiographic examination confirmed absence of lateral incisor and also the tooth transposition associated with canine and first premolar (Figure 1). First premolar was associated with short two roots. Maxillary right and left third molars were also appeared congenitally missing. Apart from these no other dental anomalies or variations were observed. Based on clinical and radiographic Patient was explained about possible treatment options for the closure of the existing space beside the central incisor and scheduled for further treatment.

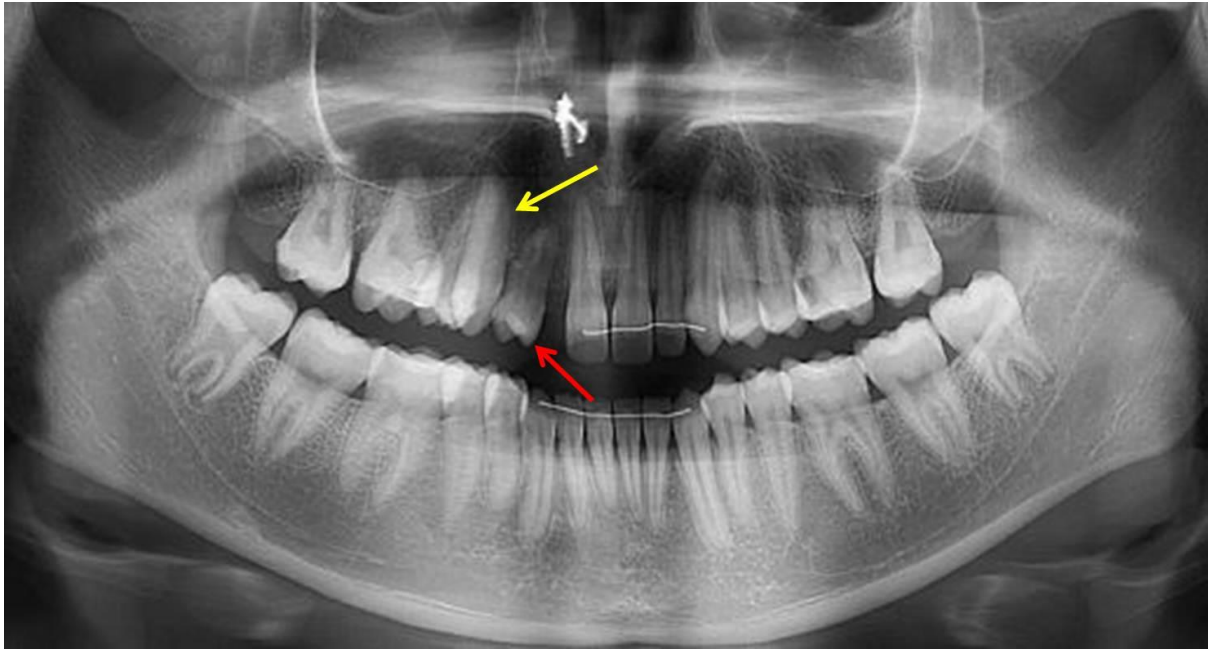


Figure 1: Panoramic radiograph showing tooth transposition associated with maxillary right canine (yellow arrow) and first premolar (red arrow). Congenital agenesis of maxillary right lateral incisor and maxillary right and left third molars are also evident.

Tooth transposition represents an extreme form of either ectopic eruption or tooth eruption order and is defined in various ways by different authors but the most descriptive definition was given by Peck and Peck in 1993 [1]. It has been classified as true/false (pseudo-transposition), partial, simple, coronal and complete/incomplete based on the tooth involved in transposition phenomenon or jaw. According to Peck and Peck, it can be defined as ‘the positional interchange of two adjacent teeth, especially their roots, or the development or eruption of a tooth in a position occupied normally by a nonadjacent tooth.’ The first description of tooth transposition was mentioned by Harris in 1849, in his first edition of “A dictionary of dental sciences, biography, bibliography and medical terminology [2]. In this book he wrote transposition as ‘an aberration in the position of teeth.’ This condition may occur either in the maxilla or mandible or involving primary or permanent dentition. However, reports of its occurrence in the mandibular arch are extremely uncommon and also in the primary dentition. In general population, the prevalence has been estimated as just 0.4% and tooth transposition involving both upper and lower arches is not reported so far in the available literature. The exact aetiology behind occurrence of this developmental condition is not known. However, several theories like trauma, lack of primary canine tooth root resorption, over-retention of primary teeth, genetic factor and interchange in the developing tooth bud’s position have been documented to explain occurrence of tooth transposition phenomenon. Among these, genetic origin is considered as the main etiologic factor [1,2]. In case of complete transposition, both crown and root are transposed, whereas in incomplete type, only the clinical crown portion is transposed, but the root apex remaining in a relatively normal position. In the case described here, the transposition was of ‘complete type’ as the whole tooth including both crown and root of permanent canine was transposed with the first premolar [1].

Peck and Peck in 1995 [1], evaluated 201 cases and based on the anatomic factors like jaw and tooth involved gave five types of maxillary tooth transpositions (Table 1).

Table 1: Maxillary tooth transposition (Given by Peck S and Peck L – 1995) [1]

Transposition Types	Transposed Tooth	Notation
Type 1	Canine – first premolar	Mx.C.P1
Type 2	Canine – lateral incisor	Mx.C.I2
Type 3	Canine – first molar	Mx.C.M1
Type 4	Lateral incisor – central incisor	Mx.I2.I1
Type 5	Canine – central incisor	Mx.C.I1

Prevalence reports shows that maxillary canine and first premolar transposition is the most commonly observed type compared to other tooth transpositions reported with a prevalence of approximately 0.13% in the population and representing 72-90% of the cases found in the maxillary arch [3-5]. A higher prevalence of its existence in female gender

and unilateral appearance has been reported compared to bilateral presence. In the present case, tooth transposition involved the maxillary right canine and first premolar and occurred in female patient. This observation was similar to the reports mentioned in the previous literature. Therefore, the case was classified as type 1 according Peck and Peck classification. It is also mentioned that left side is affected more in contrast to right side of the dental arch. But in this case, it occurred on the right side. Tooth transposition can occur isolated or can occur with other dental anomalies. Nagaveni NB, recently reported an interesting case where different three dental anomalies belonging to different dental phenomenon like talon cusp, taurodontism and tooth transposition were all together occurred in a 9-year-old Indian child patient [4]. In this case, the transposition involved the canine and first premolar and was of ‘complete type’ but was in unerupted stage which was diagnosed following radiographic examination.

Clinical significance associated with tooth transposition involves aesthetic impairment and occlusal disharmony. Usually, no treatment is required if the condition is accepted by the patient. For aesthetic purpose orthodontic movement of transposed tooth can be performed.

Conclusion

An awareness about existence of tooth transposition phenomenon is essential among all dental practitioners to diagnose and render appropriate treatment. Documentation of such unusual dental anomalies or conditions is highly essential to enrich the existing literature.

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