

Early Diagnosis and Prevention of Complete Transposition of Mandibular Lateral Incisor during Mixed Dentition

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Abstract

Transposition is a rare developmental disturbance of tooth order characterized by positional interchange of the two teeth. Transposition with adjacent tooth is very common but transposition with distant tooth is very rare. Early diagnosis of incomplete transposition during mixed dentition period intercepts the problem and prevents the developing complete transposition. The purpose of this paper was to present the advantage of early management of a rarely encountered transposition anomaly involving the mandibular permanent lateral incisor and the first premolar.

Keywords: Transposition; Developmental disturbance; Mixed dentition

Introduction

Dental transposition is a positional anomaly of the teeth which is described as the positional interchange of two adjacent teeth, or the development or eruption of a tooth in a position normally occupied by a non-adjacent tooth [1]. In some cases, transposition is caused by intra osseous migration and eruption of a single tooth into a distantly ectopic position, one ordinarily occupied by a nonadjacent tooth. It is an uncommon phenomenon, usually occurring unrelated to and independent of the commonplace condition of dental crowding. As such, tooth transposition is a designation applied to extreme types of ectopic eruption, each causing a change in the natural order of the permanent teeth.

Mandibular tooth transposition is seen less frequently and with less variety than those in the maxilla. Early detection and treatment during early mixed dentition period can prevent transposition. In the present case report patient was in end of early mixed dentition period and ectopically erupted lateral incisor brought back into its correct anatomical position by modified lingual arch appliance.

Case Report

A 10 year old girl came with chief complaint of uneven placed teeth in the lower front region of jaw.

Intra Oral Examination

The clinical examination showed that the patient's oral hygiene was good and periodontium was healthy. She was in the late mixed dentition stage and had class I skeletal and dental relationships. The over jet was 2 mm, and the overbite was 3 mm, which were within normal range. Mandibular left primary lateral incisor, canine and first deciduous molar were over retained. Mandibular left Permanent lateral incisor was erupted lingual to the left deciduous first molar and 1st premolar was erupting buccally to the left deciduous first molar. Right side permanent mandibular lateral incisor, canine and first premolar were erupted in correct order (Figure 1). Mixed dentition analysis showed there was enough space for eruption of all permanent teeth. In the upper arch teeth were erupting in to correct anatomical position and well aligned (Figure 2).

Radiological Examination

Intra oral per apical radiograph (with 73 and 74) (Figure 3) and orthopantomogram (Figure 4) was advised to see the position of left

permanent lateral incisor, canine and first premolar. Radiographs shows permanent mandibular left canine was erupting in to its correct position, permanent mandibular left first premolar was erupting buccally to the first deciduous molar and permanent mandibular left lateral incisor was erupted lingual to the first deciduous molar. Intra oral per apical radiograph shows crown of left permanent mandibular lateral incisor was tipped distolingually placed lingual to over retained first deciduous molar and root was in its original position (incomplete transposition).

Treatment

Oral prophylaxis and oral hygiene instructions were given. All the over retained teeth, 72, 73 and 74 were extracted under local anesthesia. Lower lingual arch appliance soldered with finger spring at region of lower left permanent lateral incisor to tipped back in to its correct position (Figure 5). Periodically activation of finger spring was done by opening the helix on every fifteen days. After one and half month, old finger spring was removed and new finger spring was soldered for new position and to give correct force in correct direction (Figure 6). At the end of five months tooth was in correct anatomical position (Figures 7 and 8).

Discussion

Mandibular tooth transposition is seen less frequently and with less variety than those in the maxilla. Based upon data from published surveys, transpositions involving teeth in the mandible account for 15% to 30% of all tooth transpositions [2]. Mandibular transposition involving mainly canine and lateral incisor teeth [2,3] but transposition between permanent mandibular lateral incisor and premolar has never registered.

In addition to the classification of transposition cases according to the involved jaw and teeth, they are also classified as complete or

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Figure 1: Intra Oral Picture Of Mandibular Arch Showing Transposition Of Lateral Incisor In Place Of First Premolar.



Figure 2: Intra Oral Picture of Maxillary Arch

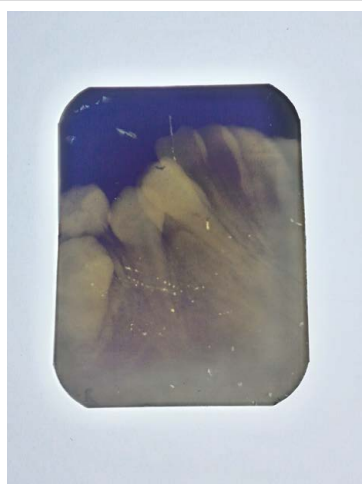


Figure 3: Intra Oral Periapical Radiograph Of 73 And 74 Region Shows Developing Lateral Incisor Transposition.

incomplete transposition. The difference between the two types is that in a complete transposition case, crowns and roots of the involved teeth are in the transposed position although whereas in an incomplete transposition case the crowns may be transposed although the root apices remain in their normal positions [4]. There are several proposed factors regarding the aetiology of transposition abnormality. These include genetic interchange in the position of the developing tooth buds [1,2], altered eruption paths [5], presence of retained primary teeth [6], trauma [7] mechanical interferences to erupting permanent teeth, and early loss of deciduous teeth [8]. However, studies that have focused upon mandibular transposition have also found evidence for local rather than genetic factors being the predominant aetiological component [3,9]. Studies have shown that transposition is more frequently seen on the right side compared to left side [2]. In the present case report, incomplete transposition of permanent mandibular lateral incisor in place of first premolar was present on left side which is rare.

The main goal of treatment of all transposition abnormalities is to correct the positions of transposed teeth. Several factors including are patient's age, occlusion, aesthetics, patient cooperation, periodontal support and treatment length should be taken into consideration in order to prevent any damage to the teeth and the supporting structures [10].

There are two different treatment approaches to treat transposition [8].

1. If the transposition is in an early stage, the position of the teeth can be corrected by the aid of fixed orthodontic treatment. However, one primary anterior tooth can be extracted to facilitate early correction.
2. If the transposition is recognized after the transposed teeth have erupted in their transposed position or where the roots of the involved teeth are parallel, it is not preferred to correct the position of the involved teeth. Because of the dense compact bone of the mandible, to correct the position of the teeth carries a high risk of damaging the teeth and supporting structures.

In the present case report, patient was in late mixed dentition stage with good periodontium health and enough space was present for eruption of permanent teeth. Patient was having incomplete transposition of mandibular lateral incisor (crown was transposed and root was in normal position) and first premolar hasn't transposed. Due to early diagnosis in present case, incomplete transposition was possible to treat in its correct anatomical position with preventive and interceptive orthodontics. Lingual arch with finger spring modification is the most effective appliance to treat incomplete transposition at mixed dentition period. We suggest patient should call for regular



Figure 4: Orthopantomogram Shows Developing Transposition Between Left Lateral Incisor And Left First Premolar.



Figure 5: Intra Oral Picture Of Mandibular Arch Shows Modified Lower Lingual Arch With Soldered Finger Spring To Correct Transposition Of Lateral Incisor.



Figure 6: Intra Oral Picture Of Mandibular Arch shows Modified Lower Lingual Arch Soldered With New Finger Spring.



Figure 7: Intra Oral Picture Of Mandibular Arch After Treatment Lateral Incisor Is In Correct Anatomical Position.



Figure 8: Intra Oral Picture Of Maxillary arch

dental check up every three months during 6 years to 13 years to guide eruption of permanent teeth, to prevent and treat malocclusion and anomaly like incomplete transposition.

Conclusion

Transposition is rare and in that mandibular transposition involving left mandibular lateral incisor and premolar is very rare. Early diagnosis and management during mixed dentition period with preventive and interceptive orthodontics is most effective and easy way to treat such anomaly and that will prevent fixed orthodontics.

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