

Case Report

Management of Mandibular Lateral Incisor-Canine Transposition-A Case Report

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Abstract

Tooth transposition is an uncommon dental anomaly, of which mandibular teeth transpositions are very rare with a prevalence rate of less than 0.003%. With early detection of transposition, interceptive treatment may resolve the problem. Whereas in later stages, complete transposition is difficult to treat and traditional approach involves extraction or recontouring of canine and lateral incisors, since correcting it by orthodontics may become hazardous to teeth and supporting structures and also involves arduous mechanics. This is a case report of 20 year old female with Mn.I2.C transposition treated successfully by a complex orthodontic approach, rather than usual extraction or recontouring technique. Repositioning of the mandibular canine to its proper position is essential for good canine guided occlusion. The reader should be able to utilize the simple techniques and successfully treat MnI2C transpositions, upon contemplating several factors into account.

Keywords: Transposition; Mandibular incisor; Mandibular canine; Complete transposition

Introduction

Tooth transposition is a unique type of ectopic eruption in which two teeth have interchanged positions in the dental arch [1]. The prevalence of tooth transposition is difficult to determine but is approximately 0.5% or less and mandibular teeth transpositions are very rare with a prevalence rate of less than 0.003% [2]. Transpositions are classified by a three-segment code as follows:

- The first segment denotes the jaw in which the transposition occurs.
- The second segment denotes the transposed tooth.
- The third segment denotes the site to which it is transposed.

The clinical case we present is an example of treatment in mandibular teeth transposition MI2C, a case of mandibular lateral incisor and canine transposition on the left side. This article describes the use of a customised components for correction of transposition with implants in an adult patient with a class I malocclusion on a class II skeletal base relationship treated without extraction.

Case Presentation

History and assessment

A 20-year old female patient reported to the department of orthodontics and dentofacial orthopaedics, Tamil Nadu government dental college and hospital, with a chief complaint of spaced and

protrusive upper front teeth. No relevant medical and dental history was elicited. She was a mesomorphic individual and her facial analysis revealed an average clinical facial height. The patient also had a convex profile with acute nasolabial angle, deep mentolabial sulcus and potentially incompetent lips. Intra-oral examination revealed increased overjet with a class-I molar relation, asymmetric maxillary and mandibular arches, spaced anterior dentition and transposed 32,33. The upper incisors were proclined with an overjet of 10 mm (Figure 1).

Investigations: Extra-oral and intra-oral radiographs, study models, lateral cephalometric radiograph, panoramic radiograph, functional examination of the patient was performed. She had an atypical swallowing pattern, the mandible moved upwards and forwards on closure, and there was 5 mm of incisor exposure at rest and 100% incisor exposure during smiling.

Diagnostic focus and assessment

Study model analyses confirmed the clinical findings with transposition of mandibular lateral incisor and canine in the lower left quadrant. Cephalometric analyses revealed a class II skeletal relationship (ANB=7), maxillary prognathism (SNA=87), orthognathic mandible (SNB=80) in relation to anterior cranial base. Both maxillary and mandibular incisors were protruded in relation to their alveolar base. The case was diagnosed as Angle's class-I malocclusion on class-II skeletal base attributed to prognathic maxilla and orthognathic mandible with an average growth pattern associated with proclined upper and lower incisors, transposition of 32,33 and protrusive upper and lower lips.

Therapeutic focus and treatment

The main goals of treatment were to retract the upper and lower incisors to correct the protrusion and spacing, to reposition the transposed 32 and 33. The patient was not aware of the transposition. The patient and her parents deferred to undergo extractions of the teeth to correct the transposition. The choice of alignment without repositioning was also not considered since lateral incisor could be a weak tooth for canine guidance [3]. Therefore mini-implants for

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retraction of upper incisors and an indigenous biomechanics for simultaneous repositioning of transposed teeth were planned. Fixed orthodontic mechanotherapy with 0.022 MBT slot was employed for this patient. The transposed canines were retracted distally after the lingual movement of lateral incisor. A modified lingual arch with three loops was used to reposition the transposed teeth. Elastic chains were suspended from transposed lateral incisor to single loop in the lingual arch. Elastics were changed to adjacent loop in a sequential manner at each phase of alignment. Soldered loops on the lingual arch added, helped in torque control along with modified Goodman torquing spring for the lateral incisor (Figure 2). Implants were used in the upper arch for retraction and intrusion (Figure 3).

Follow-up and outcome

The patient was followed for one year during retention and the results were stable. Clinically overall improvement in patient's



Figure 1: Pre-treatment intraoral and extra oral photographs. The transposed teeth are encircled.



Figure 2: Sequential steps in correction of the transposed M12C.



Figure 1: Implant assisted intrusion and retraction.

appearance well aligned and stable occlusion with good health of supporting structures was achieved.

Discussion

Tooth transposition in mandibular dentition is rare with a prevalence rate of 0.003%, lower the prevalence rate, so are the treatment options [2]. Tooth transposition in maxilla allow several treatment options to be considered whereas in mandible, the treatment options are limited to interceptive correction before eruption of canine, extraction or recontouring after the eruption of canine [1,4].

Repositioning of transposed teeth is attempted only in maxilla, especially in case of incomplete transposition [5-7]. In cases of complete transposition of mandibular lateral incisor and canine, as per the literature, alignment in transposed position followed by recontouring is advised due to difficulty in controlling root interference in dense cortical bone, bone resorption, demanding biomechanics and prolonged treatment time [3,5-8]. Alignment in transposed position could affect the aesthetics as well as the equilibration during protrusive and lateral excursions [9].

Different methods of treating transposed tooth are available in literature [5,10-12], this patient was treated with simple indigenous biomechanics to reposition the transposed teeth to their normal position, without any possible side effects. Correcting the transposition to maintain tooth order can be attempted wisely after taking into consideration several factors such as patient's age, occlusion, aesthetics, patient cooperation, periodontal support and treatment length [13]. Since nowadays TADs has revolutionised the field of orthodontics, Mini-implants were used for the retraction of upper anterior teeth in an attempt to preserve posterior occlusion.

During the treatment, the patient co-operation was good. A full cusp to fossa relationship along with normal overjet and overbite with coincident midlines was achieved. An outright knowledge about biomechanics, devised treatment plan, scheduled appointments and patient co-operation has made this a successful approach to treat MnI2C transposition (Figures 4 and 5).

Conclusion

MnI2C transpositions can be successfully treated by fixed orthodontic mechanics upon contemplating several factors into account. Although mandibular transpositions are rare, each patient deserves an appropriate treatment to maintain full complement of teeth and also to achieve rewarding results from aesthetic, functional and periodontal aspects.

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Figure 4: Comparison of pre-treatment and post treatment intra oral photographs.



Figure 5: Comparison of pre-treatment and post treatment extra oral photographs and panoramic radiographs.

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