

MAXILLARY CANINE-LATERAL INCISOR TRANSPOSITION: A CASE REPORT

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Abstract

This case report aims to present the orthodontic treatment of a patient who referred to our clinic with a chief complaint of crowding and who had left lateral canine transposition at maxilla.

In the clinical examinations of the patient; severe crowding, retained deciduous canine tooth and dental Angle Class I relation were detected. In the radiographic examinations, impacted and transposed canine tooth was observed. Skeletal Class I relation (ANB: 2°) was observed in cephalometric analysis. Fixed appliances were used in order have the transposed and unerupted canine tooth to erupt. Initially, lateral tooth was completely moved to the place of the canine and the space was obtained for canine in the arch. Then we began to have canine tooth erupt by fixing surgically eruption appliance to canine tooth. After having had an ideal occlusion and canine eruption, canine tooth was grinded to make it look like a lateral tooth and aesthetic of the gingiva at canine was provided by applying connective tissue graft.

As a result of the applied orthodontic treatment, a functional occlusion, ideal overjet and overbite relation, and aesthetic smile were provided. In the treatment planning and for the success of the transposed teeth, tooth's position and the multidisciplinary cooperation play a key role.

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Introduction

Tooth transposition is an anomaly of eruption characterized by the interchanged positions of two adjacent teeth¹. The etiology of transposed teeth has been attributed to genetic factors related to the position of developing dental lamina, or trauma to the deciduous teeth and/or retained deciduous canines^{2,3}. Unilateral transposition has been reported more often than bilateral transposition^{4,5}. Also, transpositions

occur more often the maxilla, however they can occasionally be seen in the mandible⁵⁻⁸.

Displacement and migration of teeth is common. The maxillary canine is probably the tooth most frequently displaced. When displaced in the palatolabial plane, it may become palatally or labially impacted. When displaced distally or mesially, an ectopically erupting canine can become transposed with one of the adjacent teeth⁹.

Additionally, maxillary tooth transposition most frequently involves the canine with the first premolar, and less frequently involves the lateral incisor⁹⁻¹¹.

The treatment of these patients frequently requires multidisciplinary treatment planning to achieve a long-term aesthetic and functional result¹²⁻¹⁶.

This case report aims to present the orthodontic treatment of the patient with maxillary left canine lateral transposition.

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CASE REPORT

Clinical and radiographic examination

A 14-year-old girl was referred to the Dicle University Faculty of Dentistry, Department of Orthodontics with a chief complaint of crowding. The patient was in good general health, and the medical and dental history indicated no contraindications to dental treatment. A clinical and oral examination showed severe crowding, retained deciduous canine tooth and dental Angle Class I (Figures 1,2). Impacted and transposed canine tooth was observed in the radiographic examination (Figure 3). In lateral cephalometric evaluations, skeletal Class I relation (ANB: 2°) was detected.



Figure 1. Pretreatment intraoral photographs.



Figure 2. Pretreatment facial photographs.



Figure 3. Pretreatment cephalometric and panoramic radiographs.

Treatment plan and procedure

In the treatment planning of the maxillary canine-lateral incisor transposition, at least 2 options

should be considered. The first option is aligning the involved teeth in their transposed positions and the other one is moving them to their correct anatomic position in the arch.

Dental and facial aesthetics of the maxillary anterior teeth should be carefully evaluated and considered in deciding which treatment option to follow. Repositioning the completely transposed anterior teeth to their normal sequence in the arch is very complex and time-consuming. Some authors suggest that it should not even be attempted as there is a risk of jeopardizing the roots and damaging the supporting structures. Despite the compromised aesthetic results, they suggest aligning the teeth in their transposed positions^{5,17}. Therefore, we planned to align the involved teeth in their transposed positions.

We began the treatment of the patient by extracting retained deciduous canine tooth. In order to make transposed and impacted canine tooth erupt, firstly 0.018 x 0.022 inch fixed Roth Edgewise appliances were applied. After the leveling, lateral tooth was moved into the space of the canine tooth and the space was obtained in the arch for canine tooth. Then, eruption appliance was placed surgically to the canine tooth. After the canine tooth erupted completely (Figure 4), it was grinded to make it look like a lateral tooth and the aesthetic of the canine was provided by applying connective tissue graft. As a consequence of the treatment, the patient has had pleasing aesthetic and smile (Figures 5,6,7). In 14-month follow-up; the patient's occlusion was stable, oral hygiene was adequate, and the patient was satisfied with the aesthetic results (Figure 8).



Figure 4. Canine was erupted into lateral tooth's position.



Figure 5. Posttreatment intraoral photographs.



Figure 6. Posttreatment facial photographs.



Figure 7. Posttreatment cephalometric and panoramic radiographs.



Figure 8. Before and after applying connective tissue graft.

Discussion

Canine transposition has been reported to be the most common transposition found in the human dentition^{18,19}. Maxillary canine-lateral incisor transposition is a relatively rare anomaly, with both dental and facial aesthetic implications¹². Transpositions affect both sexes, but female patients have been reported to outnumber male patients in the prevalence of this

anomaly^{2,20}. This approximate 2:1 ratio is in general agreement with many reports that indicate female predominance for this anomaly^{2,5,6,10,20,21}.

There is a distinction between a complete and an incomplete transposition²². In complete transposition, both the crowns and the entire root structures of the involved teeth are found parallel in their transposed positions. In incomplete transposition (also called "pseudo" or "partial") the crowns may be transposed while the root apices remain in their normal positions. Alternatively, the crowns may be in the correct order while the root apices are transposed. Thus, the 2 involved teeth overlap and their long axes cross each other. In addition, the crowns and roots of the 2 involved teeth may completely superimpose each other on normally projected radiographs⁹. Therefore, complete radiographic analysis is crucial in the treatment planning and evaluations of transposed teeth.

Transposition treatments can vary from case to case. In the treatment planning, the existence of the other tooth anomalies and the evaluation of the tooth and gingiva together at crowding region are very important. In maxillary canine-lateral transposition, there are two problems to overcome: the ability of the lateral incisor to function as a canine and the ability to disguise the canine and lateral incisor as each other. The upper lateral incisor is less favorable for "canine guidance", as its root is usually thin and short. Hence, conversion to group function may be suggested for non-extraction cases.

Camouflage of the upper canine often requires grinding of its tip, a combination of grinding and adding composite resin, or a porcelain veneer. The canine has a broader and higher gingival contour, compared with the lateral incisor, so this may make the aesthetic result pleasing in those with a high smile line²³. However, the patient's transposed canine gingival contour was very high after the orthodontic treatment. Therefore, we applied periodontically connective tissue graft in order to obtain an aesthetic smile and pleasing result.

Conclusions

In the treatment planning and success of the transposed teeth, tooth's position and interdisciplinary cooperation play an important role. As a result of applied multidisciplinary

treatment, we have achieved a functional occlusion, ideal overjet and overbite relations and aesthetic facial appearance and smile.

Declaration of Interest

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