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*Journal homepage: <http://www.journalijar.com>***INTERNATIONAL JOURNAL
OF ADVANCED RESEARCH****RESEARCH ARTICLE****Orthodontic correction of transposed maxillary canine with lateral incisor and the palatally impacted canine on the other side- A Case report****Suma S¹, Bhagyalakshmi A², Chandrashekar BR³, Saritha Venugopal⁴****1. & 2.** Reader, Dept. of Orthodontics, JSS Dental College, Mysore,**3.** Professor, Dept. of Public Health Dentistry, JSS Dental College, Mysore,**4.** Sr. lecturer, Dept. of Orthodontics, Mamata Dental College, Khammam.**Manuscript Info****Manuscript History:**

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Key words:Transposition, Impacted canine,
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Very few cases have been reported in regard to transposed canines and little has been presented in the literature about this rare phenomenon. In this case report, identification techniques and treatment options are presented along with the treatment results of a patient diagnosed with a transposed maxillary canine. The treatment protocol for this patient involved a combination of orthodontic procedures and surgical procedures. Through a collaborative effort of a team made up of an orthodontist, periodontist and an oral surgeon, these techniques were used to achieve an excellent esthetic and functional outcome.

Corresponding Author*Suma S***Copy Right, IJAR, 2015,. All rights reserved***INTRODUCTION**

Impaction refers to a failure of a tooth to emerge into the dental arch, usually due to either space deficiencies or the presence of an entity blocking its path of eruption. Although heredity has long ago been described as playing a role, many times the etiology is unknown. Impacted teeth are commonly found in dental practice, and they pose a threat for the maintenance and continuity of dental health.

Impaction of the maxillary canine is 3 times more than that of the mandible and more frequently among females than males. Palatal impactions are reported to occur 2-3 times more frequently than buccal ones. The palatal impaction of maxillary permanent canines is a frequently encountered clinical problem. Genetic factors are largely responsible for this anomaly. Other causes suggested for canine impactions are usually the results of any one or combination of the following factors: Tooth size-arch length discrepancies, prolonged retention or early loss of the deciduous canine, abnormal position of the bud, dilacerations of the root, ankylosis, cystic or neoplastic formation and the absence of the maxillary lateral incisor.

The presence of the impacted canine may cause some effects such as migration of the neighboring teeth which results in the loss of arch length, internal resorption and dentigerous cyst formation, external root resorption of itself as well as the neighboring teeth and combinations of the above sequelae. Potential complications emphasize the need for close observation of the development and eruption of these teeth during the examination of the growing child.

The orthodontic treatment of a palatally impacted canine is aimed at bringing the tooth into its correct position in the dental arch without causing any periodontal damage. To achieve this goal, a variety of surgical and orthodontic techniques have been proposed in relation to the position of the impacted tooth.

Transmigration refers to the physiological migration of an unerupted tooth across the midline in the absence of pathology or trauma. The etiology of transmigrant teeth is not known, although it is thought to be the result of a malpositioning of the dental lamina during the embryonic stage of tooth development. Combining a recent study with an exhaustive compilation of earlier reports on transmigratory mandibular canines from 1952 to 1994, Joshi found that 89% were impacted, and 91% were unilateral. These teeth are generally asymptomatic and although the tooth is far from its original site, it maintains its nerve supply from the side which it came.

Transmigrant teeth usually require clinical and radiographic examination to diagnose because they are usually found within the symphysis of the mandible. Clinical clues include over retention of the primary canine, Proclination of the mandibular teeth, and an enlarged symphyseal area that grows to accommodate this malpositioned tooth. Panorex, occlusal, periapical, and submentovertex projections can be used to confirm the three-dimensional location of the transmigrated tooth because they are often found beneath the apices of the mandibular teeth, and located either buccally, lingually, or centrally. In this case report, we describe the surgical and orthodontic treatment of a palatally impacted canine by using the cantilever spring method along with the correction of transposed teeth.

CASE REPORT

Diagnosis:

A 15 year-old female patient referred to the orthodontic clinic for the unaesthetic appearance of her crowded maxillary anterior teeth. The clinical examination revealed an Angle Class I molar relationship, a transposed maxillary right canine with lateral incisor, right canine in cross bite and a persistent left deciduous canine. The permanent left canine was not seen in the arch. There was also a total of 3 mm between the left lateral incisor and deciduous canine and mandibular teeth were reasonably well aligned (Fig 1 & 2). The clinical and radiological examination showed that the left permanent canine was impacted palatally (Fig 3).

Treatment objectives:

The objectives of the treatment was to correct transposition of right canine and lateral incisor, to prepare adequate space for the upper canines and properly position the impacted left canine into the arch to obtain a good alignment of the teeth. Because the lower teeth were in good alignment, no treatment was planned in the lower jaw.

Treatment plan:

Considering the facial profile, available space and Cephalometric analysis we decided to start the case non extraction. The anchorage was reinforced with the use of transpalatal arch. For the correction of transposition and cross bite we planned to use posterior bite plane. After the initial alignment, it was planned for surgical exposure followed by deimpaction of left canine with the use of cantilever spring then finishing and detailing of the case. As there was Bolton's discrepancy because of the peg laterals in the maxillary arch it was planned for restorative procedure.

Treatment:

The treatment started by banding and bonding in maxillary arch with .022 slots MBT prescribed brackets. Initial leveling was accomplished with a .016 inch HANT wire. We allowed reversion of transposed maxillary right canine and lateral incisor the procedure is illustrated in the Figure no. 4. After the correction of transposition and completion of alignment we started gaining the space for left maxillary canine with the use of open-coil springs. The case has been reevaluated for the space availability to deimpact the left maxillary canine. The deciduous right canine was not removed and kept in place during the preoperative orthodontic treatment to maintain the space. Following 8 months of orthodontic therapy, the patient was referred to the surgeon for the extraction of deciduous canine and to exposure the impacted canine. The surgical opening immediate bonding was performed. Bonding was done on the lingual surface of the canine with Begg's bracket.

Treatment progress:

After the suture removal the application of the force stated using cantilever spring. The cantilever spring was activated with the regular interval till the canine was into the arch form. Once the canine was in the arch the bracket was replaced to MBT system and 0.016 HANT was placed followed by 19X25 HANT (Fig 5). The treatment progressed with the placement of 19X25 stainless steel wire for complete expression of torque. Then the case was debonded and allowed for natural settlement of the occlusion (Fig 6, 7 & 8). The patient has been informed to get the restorative procedure done for the peg laterals.

Discussion

This case is a complete, or real, transposition because the root apex of the upper canine is mesial to the upper lateral incisor. Because this is a real transposition with parallel roots, correction could pose serious problems of root interference and root resorption, jeopardizing the vitality of one or both teeth and damaging their supporting structures. However, space is needed to correct the transposition teeth, and extractions of deciduous canine make space available. No endodontic or periodontal problem that might discourage this treatment approach was observed, although considerable time was spent to reverse, upright, and parallel the roots of the canine and lateral incisor. In this case, no irregular central incisor root was seen, nor did the patient or parents recall any traumatic injury to the teeth before the eruption of the permanent incisors or canines.

Maxillary permanent canines are important for an attractive smile and are also essential for a functional occlusion. Therefore, extraction of the canines should be avoided, if at all possible. In the case of maxillary impaction, surgical exposure of the related tooth and the use of fixed orthodontic appliances is the most frequently used treatment alternative as long as the tooth position is favorable. Various methods have been used for moving the canine into proper alignment both in case of transposition and impactions.

This case report showed that with the use of cantilever spring method, the right palatally impacted maxillary canine was brought in its proper place on the dental arch without giving any damage to the neighboring teeth. It has been reported that the orthodontic treatment of palatally impacted canines may cause root resorption of the adjacent lateral incisors or premolars.

Fig1: Pre Treatment Intra Oral Photographs



Fig 2: Pre Treatment Extra oral photographs

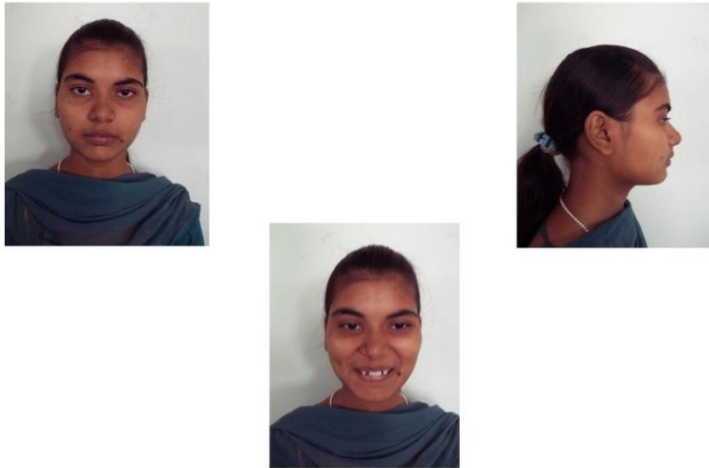


Fig 3: Pre treatment Radiographs





Fig 4: The upper arch of the patient illustrates the sequence used to reverse the transposition: (a) the original transposition and crowding condition; (b) first premolars removal; (c) the left lateral incisor moving palatally to allow the left canine to be moved palatally in the arch alignment; (d) the left canine moving distally along the alveolar bone; (e) the left lateral moving labially and mesially; and (f) space closure to correct midline.

Fig 5: Mid Treatment Intra Oral Photographs



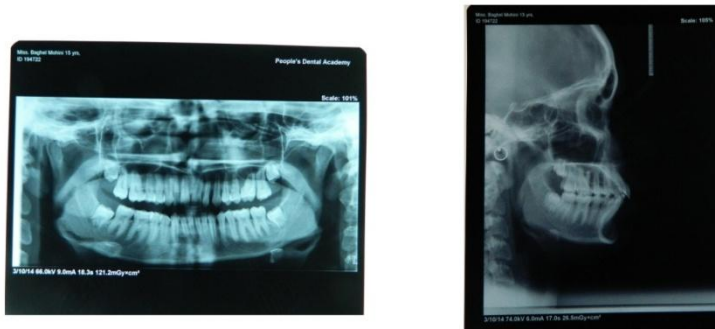
Fig 6 : Post Treatment Intra Oral Photographs



Fig 7: Post Treatment Extra Oral Photographs



Fig 8 : Post Treatment Radiographs



Conclusion

This case followed the philosophy of correcting the transposed and impacted teeth when possible, with care to control the negative factors. The key to success is to treat early, because the treatment can be accomplished with fewer possibilities of injuring the surrounding tissues. One must be aware of the esthetic factor, occlusion, cuspid root apex position, treatment length, patient cooperation, periodontal support, and patient's age when correcting transposed teeth.

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