CLINICAL MANAGEMENT OF BILATERAL MAXILLARY CANINE IMPACTION
WITH MISSING MANDBULAR PREMOLAR – A CASE REPORT

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Abstract
A case of bilateral maxillary canine impaction with retained deciduous canines at the age of 19 years is presented. Although the incidence of impaction is very low, (maxillary canine impaction = 2%) these cases are very challenging to manage1. Extraction of an impacted canine may be the best treatment alternative in certain circumstances, but because of unique functional and esthetic characteristic of the permanent canine, it is logical to do every possible effort to bring an impacted canine into proper position in the arch. Many techniques and appliance designs have been proposed for this purpose. In the present case the k-9 spring was used for alignment of impacted canine and found to be very effective. Active treatment time was about 16 months. Post treatment records shows no crown lengthening and sufficient amount of attached gingiva.

Keywords
Bilateral maxillary canine impaction, open window technique, light cure bonding, K-9 spring and Auxillary overlay wire.

DESCRIPTION:
The maxillary permanent canine is generally considered to be an important tooth in the dental arch by virtue of its place in the scheme of functional occlusion, its contribution to the appearance of the individual, its size and root length and its role in establishing arch form. For all these reasons, orthodontists have accepted the challenge of the impacted canine with enthusiasm and have recommended many methods and ideas to bring about its speedy and effective resolution13. The etiology of tooth impaction has long been related to arch length deficiency. This is valid for most impactions but not for palatal impaction of maxillary canine. The buds of the maxillary canine is wedged between the nasal cavity, the orbit, and the anterior wall of the maxillary sinus. The buds of the lateral incisor and the first premolar are located behind the canine's palatal surface. An arch length deficiency will not allow the maxillary canine to 'jump' the buds, the nasal cavity, or the sinus in order to reappear in the palate2. A canine can be palatally impacted if an extra space is available in the maxillary bone. This space can be provided by:
1. Excessive growth in the base of the maxillary bone.
2. Space created by agenesis or peg shaped lateral incisors.
3. Stimulated eruption of the lateral incisor or the first premolar.
A dysplasia in the maxillary – premaxillary suture can also modify the direction of the maxillary canine eruption.

Treatment strategy depends on the proximity of the tooth to line of arch, its position in maxilla and also on
patient motivation. The patient must first be prepared for the treatment that is to be undertaken, initially by explaining the nature and ramifications of the problem, using the radiographs. Oral hygiene should be excellent before any surgical procedures. In the non-cooperative patient treatment should be denied.

**DIAGONOSIS:**

The patient named Subhi 19 years old female reported to the Faculty of Dental Sciences, C.S.J.M.M.U., Lucknow for restoration of carious teeth. Fortunately she was diagnosed as having retained maxillary deciduous canine at that time. Case was referred to Department of Orthodontics and Dentofacial Orthopaedics for management. Routine study models, photographs and radiographs (Panoramic radiograph, upper occlusal radiograph, Intraoral periapical x-ray of 432 234 region were prepared. Extraorally she had symmetric and well balanced pleasing profile. On intraoral examination dentition present was 654C21 12C4567 764321 1234567.

With mild mandibular anterior crowding, mandibular right second premolar was found missing as there were no history of extraction. Radiographic evaluation shows unerupted permanent maxillary canines and maxillary second molars. Third molars in both maxillary and mandibular arches were absent. Roots of the maxillary central incisors were dilacerated distally. (fig.1).

For management, surgical exposure of impacted canines under local anesthesia and by extraction of deciduous canines were planned. Appliance used was 0.022 x 0.028 preadjusted edgewise appliance (Roth prescription). Transpalatal arch used for molars control and light cure bonding was used to bond lingual buttons on impacted canines to prevent bond failure. Bonded lingual retainers were planned as retention after strategy.

**Treatment Progress:**

In the course of treatment bands, brackets and transpalatal arch were placed. Initial alignment and leveling of maxillary arch was completed. Consolidation of the entire arch into a composite anchor unit, using a heavy rectangular 0.019" x 0.025" SS base arch was done.

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**Figure - 1**

19 year old female with bilateral maxillary canine impactions and missing right mandibular second premolar before treatment.
and a removable splint plate was fabricated. Surgical exposure of the canines were done by open window technique. Lingual buttons were bonded at the most accessible and convenient surface of the impacted canine by using light cure bonding technique. A 0.012" soft ligation wire is threaded around the lingual button, and their free ends were shortened to a convenient length and ligated loosely to main arch wire. Splint plate was placed to protect the surgical site and discontinued after 5 days.

Finally the arch form finishing and detailing was completed by sequence of wires as (0.018" x 0.025") CuNiTi, (0.019" x 0.025") SS and finally(0.021" x 0.025") SS wire(Fig.4).

![Fig.4 overlay wire(0.016" NiTi) was used at gingival wing of canine bracket to facilitate eruption.](image)

While doing labial movement of maxillary canines, the mandibular arch was banded and bonded simultaneously. Alignment wire 0.016 NiTi was placed for alignment and levelling. Thereafter space between mandibular right canine and first premolar was closed. Molar was settled in super class I molar relationship on right buccal side, and finishing and detailing of lower arch was completed.

Following a golden rule fixed lingual retainers were bonded using light cure bonding technique before removal of fixed attachment10 (Fig. 5). Total active treatment time lasts for 16 months. Post-treatment records shows no crown lengthening and sufficient amount of attached gingival (Fig. 6). Advisable retention period should not be less than 3 years.
Discussion:

After initial alignment and leveling it is more or less universally accepted procedure to surgically expose the impacted tooth, to provide the orthodontist, the access needed to apply eruptive force to erupt the tooth. This is usually achieved by the placement of some form of attachment to the newly uncovered tooth and ligating this directly to the labial arch wire, through the use of elastic thread, for as long as there is an unimpeded and clean path between the crown of the canine and its prospective final place in the arch. This is often the most efficient way to solve the problem.

The palatal canines are best erupted by K-9 spring which is simple in design and appropriately suited to generate required eruptive force as well as a distal traction by activation which is quite favourable for mesially angulated canines.

Overlay wire (CuNiTi 0.014") was used for alignment purpose. This mechanics is preferable because it also controls the vertical elongation of canine, while maintaining the arch integrity by main arch wire, which is preferable to cross the canine from palatal to its normal position. Important thing to be noted that alignment only be attempted after the eruption of canine properly because crown has no property of resorption of bone by applying force but it may can develop exuberant tissue, which may be suggestive of loss of attached gingiva. A force of 45 gm is generally considered to be optimal for eruption of canine.
In the mandibular arch one way to restore the right second premolar was prosthetic bridge or implant after creation of space for it. Though the space available was merely up to 2mm. between right canine and first premolar, it was better to settle the molar in that side in super class I molar relationship. This is the lifetime best maneuver for treating these cases, as prognosis of prosthesis is questionable for long time and frequent refabrication of prosthesis is required.

References: