

## Management of Bilateral Maxillary Buccal Canine Impaction with Variable Prognosis : A Case Report

### Abstract

Treatment planning decision regarding management of canine impaction depends upon various factors. One of the critical variable is the prognosis of the impacted canine on the basis of viability of relocating and traction of the canine into its normal position. Here a case report is presented where two maxillary canines are impacted but different in location to adjacent teeth and hence bearing variable prognosis. While one of the canine could be aligned to its normal position, the other had to be extracted.

### Key Words

Impaction, Radiation, Haemostasis

<sup>1</sup> Anup Kanase

<sup>2</sup> Anil Nafria

<sup>1</sup> Associate Professor, Department of Orthodontics and Dentofacial Orthopaedics, Maulana azad institute of Dental Sciences, New Delhi -110002

<sup>2</sup> Senior Resident, Department of Orthodontics and Dentofacial Orthopaedics, Maulana azad institute of Dental Sciences New Delhi -110002

### Address For Correspondence:

Anup Kanase,  
Associate Professor, Department of Orthodontics and Dentofacial Orthopaedics, Maulana azad institute of Dental Sciences, New Delhi -110002

Date of Submission : 25-Oct-2010

Date of Acceptance : 12-Jan-2011

### INTRODUCTION

Impaction of tooth is a retardation or halt in the normal process of eruption. In contemporary view an impacted tooth is one "whose eruption is considerably delayed, and for which there is clinical or radiographic evidence that further eruption may not take place".<sup>1</sup> Kuflinec states impaction is a condition in which a tooth is embedded in the alveolus so that its eruption is prevented or the tooth is locked in position by bone or by the adjacent teeth. <sup>2</sup> Hence, an impacted tooth is the one that fails to erupt into a normal functional position past its root formation which may be attributable to physical impedance (other tooth or surrounding soft or hard tissue), ankylosis, a systemic cause or primary failure of eruption.

Permanent maxillary canines are the second most frequently impacted teeth; the prevalence of their impaction is 1-3% in the general population.<sup>3</sup> Methods of diagnosis that may allow for early detection and prevention should include a family history, visual and tactile clinical examinations by the age of 9-10 years and a thorough radiographic assessment.

A canine is considered as being impacted if it was unerupted after complete root development or if the contra lateral tooth was erupted for at least 6 months with complete root formation. <sup>4</sup> The maxillary canine is normally not palpable in the buccal sulcus at 8-9 years of age. A spontaneous correction of palatally placed canines up to the

age of 10 years is considered highly probable. <sup>5</sup> Therefore, if a maxillary canine is not palpable after 10 years of age one should start to suspect impaction. Clinical variables such as sex and dental age of the remaining teeth should be considered and the chronological age of the child should not be the lone diagnostic criteria.

### Radiographic assessment

1. A single periapical film provides the clinician with a two-dimensional representation of the dentition. In other words, it would relate the canine to the neighboring teeth both mesiodistally and superoinferiorly. To evaluate the position of the canine buccolingually, a second periapical film should be obtained by one of the following methods.

- a. Tube-shift technique or Clark's rule. Two periapical films are taken of the same area, with the horizontal angulation of the cone changed when the second film is taken. If the object in question moves in the same direction as the cone, it is lingually positioned. If the object moves in the opposite direction, it is situated closer to the source of radiation and is therefore buccally located.
- b. Buccal-object rule. If the vertical angulation of the cone is changed by approximately 20° in two successive periapical films, the buccal object will move in the direction opposite the source of radiation. On the other hand, the lingual object will move in the same direction as the source of radiation. The basic principle

of this technique deals with the foreshortening and elongation of the images of the films.

Occlusal films also help determine the buccolingual position of the impacted canine in conjunction with the periapical films, provided that the image of the impacted canine is not superimposed on the other teeth.

According to Orton et al <sup>6</sup> the lateral cephalogram offers information about 3 aspects of unerupted maxillary canines: (1) inclination of the tooth axis, (2) height of the unerupted canine tip relative to the occlusal plane, and (3) sagittal position of unerupted canines relative to the incisor roots.

Methods of diagnosis that may allow for early detection and prevention should include a family history, visual and tactile clinical examinations by the age of 9-10 years and a thorough radiographic assessment. The management of these impacted canines include (i) interception by extraction of deciduous teeth, (ii) extraction of permanent impacted tooth with poor prognosis and (iii) exposure with orthodontic traction.

The following case report demonstrates how bilaterally impacted maxillary canines in same case were managed with different approach due to different prognosis.

**Manju, a 15 yr** old female patient reported in the orthodontic clinic 25 months back, with the chief

complaint of crowded upper and lower front teeth. Extra-oral examination (fig1,2&3.) revealed the patient had an apparently symmetrical mesoprosopic face form, competent lips, straight facial profile .

**Fig1. Extraoral profile view of the patient (right side).**



**Fig2. . Extraoral profile view of the patient (Left side).**



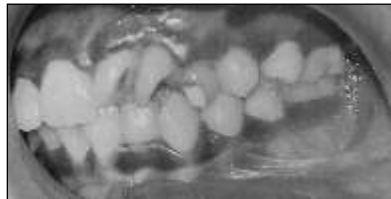
**Fig3. Fig.3. Extra oral frontal view of the patient (right side).**



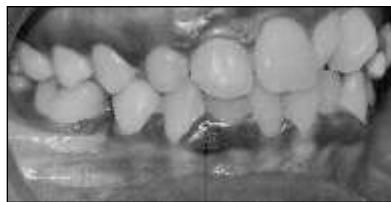
Intra-oral examination (fig 4,5&6) revealed

healthy Periodontium with melanin pigmentation of attached gingivae and the presence of full complement of teeth except third molars, mandibular right second premolar and maxillary canines in the arches, Angle's Class I first permanent molar relation, upright upper and lower incisor with mild crowding in the lower anterior segment. There were retained 53 and 63 while 21 and 22 were rotated, and adjacent deciduous canine was carious, restored and discolored. The upper midline was shifted to the right. Functional examination of patient showed normal speech pattern, oro-nasal breathing and typical swallowing pattern. The path of closure of mandible was normal without any deviation and there were no other associated signs or symptoms of TMD.

**Fig.4.Intraoral buccal view of the patient (left side) showing Class I molar relation and left deciduous canine and rotated upper left lateral and central incisor**



**Fig.5. Intraoral buccal view of the patient (right side) showing Class I molar relation and right deciduous canine.**



**Fig.6. Intraoral frontal view of occlusion of the patient.**



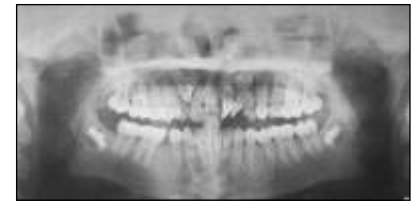
**Cephalometric analysis (fig 7)** revealed that patient was in CVMI stage V had Class I skeletal bases. The low mandibular plane angle depicted horizontal growth pattern of the mandible. Maxillary and mandibular incisors were positioned normally.OPG(fig 8) reveals all teeth second molar to second molar except 2nd mandibular right premolar. 13 and 23 were impacted.21 endodontically treated with resorbed root. 22 show dilacerated roots. Occlusal view (fig 9)confirmed the impaction of the 13 and 23. The impacted teeth were angulated

mesially in the buccal region.

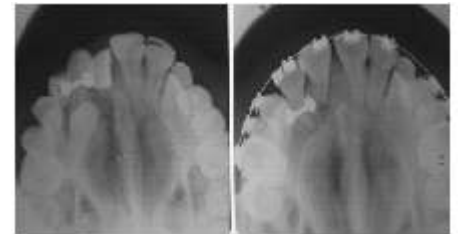
**Fig.7. Lateral cephalogram with teeth in occlusion.**



**Fig. 8. Orthopantomograph showing the position of canine. It should be noted that the right and left permanent maxillary canines are impacted but are present in different location with respect to adjacent lateral incisor. On the right side the canine is in sector I and on the left side the canine is in sector IV.**



**Fig .9. Pre treatment and midtreatment occlusal view of maxilla .Note in the mid-treatment occlusal view the right side permanent canine could be easily aligned and positioned in the arch while the left side permanent canine is missing as it was extracted due to unfavourable prognosis.**



The treatment plan was to extract 23,53 and 63 due to poor prognosis and disimpaction of 13, followed by guiding the right maxillary canine into its natural position with the help of orthodontic traction force.

At the end of the treatment the following objectives were achieved

- 13 deimpacted and aligned in the arch
- Crowding relieved
- Normal Overjet and overbite achieved
- Class I molar relationship retained

## Discussion

According to a study, interceptive extraction of the primary canine resolves permanent canine impaction in 62% of cases and 17% show improvement in their position. 7 A major predictor of success is the relationship of tip of the permanent canine crown with the roots of lateral incisors: those distal to lateral incisors have better chances of successful eruption than which are more mesially positioned.8

Surgical removal of the tooth is indicated if there is poor prognosis, patient co-operation or poor position for alignment (canine in an oblique or horizontal position). Ideally, there should be a good lateral incisor/first premolar contact. In cases where the patient is willing to undergo comprehensive treatment, it is possible to use the first premolar as a adequate replacement for the canine .Grinding of the premolar palatal cusp is also necessary.

Surgically assisted orthodontic guidance is required when a definite diagnosis of impaction has been made, and all possibilities of its natural eruption have been exhausted. Surgically assisted orthodontic guidance of eruption is usually considered after complete root apex formation.9

To guide the eruption of tooth, first a large periodontal flap with mucoperiosteum is raised a very careful chiseling on bone is done , based on earlier radiological assessment and palpation of maxillary bone to locate the canine . The bone is carefully removed preferably towards the crown tip. Efforts are made not to uncover CE junction or disturb periodontal fibers. Great care is taken not to disturb the neighboring teeth. Once the crown is exposed a bonding attachment with a well fitting contour with tooth surface is selected and bonded to tooth with direct bonding technique. To prevent tearing of flap and buttonholing the attachment should preferably be the one with low profile and minimal labiolingual thickness.

The most critical aspect of the procedure is maintenance of moisture free environment for successful bonding. Very small pieces of gauze soaked in local anesthesia with adrenaline, pushed into space between tooth and bone created by removal of tooth follicle helps in local haemostasis .For maintaining moisture free tooth surface a powerful suction and continuous flow of air gently blown over the tooth crown surface.

The force of traction is directed at the centre of crest of the alveolar ridge. Light forces of magnitude 20- 60gm should be applied to align the canine. Niti coil Spring is used for this purpose. The flap is closed with sutures and patient is reviewed after a week.

## Conclusion

Maxillary canine impaction can be treated successfully by adhering to a strict protocol and careful technique as demonstrated by the abovementioned case report.

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