

MANAGEMENT OF PALATALLY IMPACTED MAXILLARY CANINE – CASE REPORT

^[1]Dr. Nimisha Mithradas, ^[2]Dr. Anu Varghese, ^[3]Dr. Sudeepthi.

^[1]Senior lecture, Department of Periodontology, Thaimoogambigai Dental College & Hospital.

^[2]Department of Periodontology, Thaimoogambigai Dental College & Hospital.

^[3]Department of Orthodontics, Thaimoogambigai Dental College & Hospital.

ABSTRACT

Impaction of maxillary and mandibular canine is a frequently encountered clinical problem, the treatment of which usually requires an interdisciplinary approach. Diagnosis of impacted canine includes clinical and radiographic examination. Surgical exposure of the impacted tooth and the complex orthodontic mechanisms are applied to align the tooth into the occlusion. In this case report palatally impacted maxillary canines are exposed surgically and orthodontically aligned to more buccal position.

KEY WORDS: Impacted canine, canine displacement, surgical exposure of canine.

INTRODUCTION

The surgical exposure of an impacted tooth especially the canine, remains a challenge to clinicians. An impacted tooth is one, that is prevented from eruption because of malposition, lack of space or other impediments. Tooth impaction can be defined as the infraosseous position of tooth after the expected time of eruption, whereas the anomalous infraosseous position of the canine before the expected time of eruption can be defined as displacement.[1] The canine impaction is of more frequent occurrence next to third molars. The incidence of an impacted maxillary canine is 2% and that of mandibular canine is 0.2%. [2] The incidence of a maxillary canine impaction is 2 times more than that of a mandibular canine and it is twice more common in girls than boys.[3] Among maxillary canine impactions, palatal displacement is more common than buccal displacement. Since permanent canines are important for esthetics and functional occlusion, any factors that interfere with their development and function can have serious consequences on the dentition. Common causes of maxillary canine displacement include space

deficiency, long torturous eruption pathways of canines and disturbances associated with the follicles of unerupted teeth.[4]

The diagnosis of an impacted canine is based on clinical and radiographic examinations. Periapical films relate the canine to the neighbouring teeth both mesio-distally and superior inferiorly. Occlusal films can also determine the buccolingual position in conjunction with the periapical film. Cone beam computerized tomography (CBCT) helps in the evaluation and surgical treatment planning of impacted teeth. CBCT can also provide elements for the impacted teeth such as the size of the follicle, the amount of bone covering the tooth, buccal or palatal position and the three dimensional proximity of adjacent teeth, which are useful for the management of impacted canines.[5] The ideal approach for managing an impacted canine is an early diagnosis and interception of the potential impaction. If timely interception is not possible, then surgical exposure and orthodontic treatment should be considered as the next option. Surgical exposure of the impacted canine has been found to be esthetically, functionally and occlusally acceptable. The timely exposure of an impacted canine can prevent the formation of periodontal defects and cysts in the area.[6] Treating impacted canines can pose problems like external root

resorption, devitalization and ankylosis. If the surgical procedure is not correctly designed, the unerupted teeth will be left with inadequate keratinized tissue, which may lead to gingival inflammation and serious periodontal consequences.[7]

CASE REPORT-1

A 16 year old female patient reported to the Dept. of Periodontics, Thaimoogambigai Dental College, Chennai, with the chief complaint of shaking tooth in right upper front region. Clinical examination revealed the presence of retained right maxillary primary canine and missing permanent right maxillary canine.(Fig 1) On palpation, the impacted canine showed an erupting position that was palatal to the crest of alveolar bone and entirely within the palatal mucosa. The patient was referred to Dept. of Orthodontics for opinion and management of impacted canine. Routine study models, intra oral periapical radiographs and Cone Beam Computerized Tomography (CBCT)(Fig 2&3) were taken to assess the location of impacted canine accurately. Surgical canine exposure procedure with open window technique and orthodontic treatment was planned for this patient after extraction of primary canine.



FIG :3

SURGICAL PROCEDURE

Under local anaesthesia, semilunar incision was given around the crown of impacted canine and a window of palatal mucosa and bone overlying the crown was removed. (Fig 4) Lingual button was bonded onto the lingual aspect of impacted canine after 3 weeks. (Fig 5) A closed coil spring was ligated to the lingual button on impacted canine and the mucoperiosteal flap was placed back and sutured. The other end of the coil spring was ligated to the lingual sheath of band in 16. Light force of about 20 gms applied for the orthodontic traction of impacted teeth. A 17 x 23 stainless steel wire was used as a main arch wire for stabilization along with a trans-palatal arch. After one year of orthodontic treatment the impacted canine was found to have moved to its required anatomical position. (Fig 6)



FIG :1



FIG:2



FIG: 4



FIG: 5

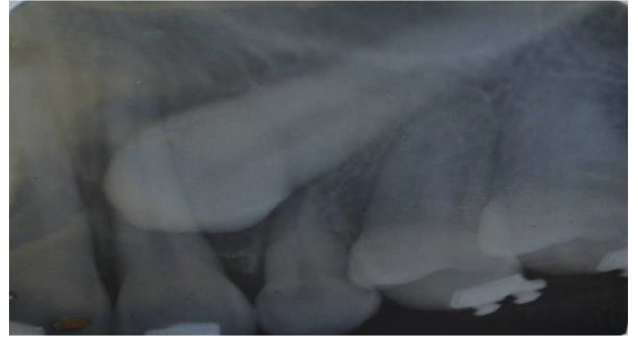


FIG :7



FIG: 6



FIG:8

CASE REPORT 2

A 18 year old female patient reported with the chief complaint of deposits on teeth. Clinical examination revealed the absence of left maxillary permanent canine and presence of primary canine. (Fig 7) IOPA radiograph was taken. (Fig 8) On palpation, the impacted canine showed an erupting position that was palatal to the crest of alveolar process. Surgical canine exposure procedure with closed window technique and orthodontic treatment was planned for the 2nd patient.

SURGICAL PROCEDURE

The mucoperiosteal flap was elevated by semilunar incision and minimal of bone was removed to expose the impacted crown. Lingual button was bonded on the lingual aspect of impacted canine. A closed coil spring was ligated to the lingual button on impacted canine and the mucoperiosteal flap was placed back and sutured. (Fig 9) The other end of the coil spring was ligated to the lingual sheath of band in 26. Light forces of about 20 gms applied for the orthodontic traction of impacted teeth. After 8 months of orthodontic treatment, the canine was found to have moved to a more buccal position thus favouring both esthetic and functional requirements. (Fig 10)

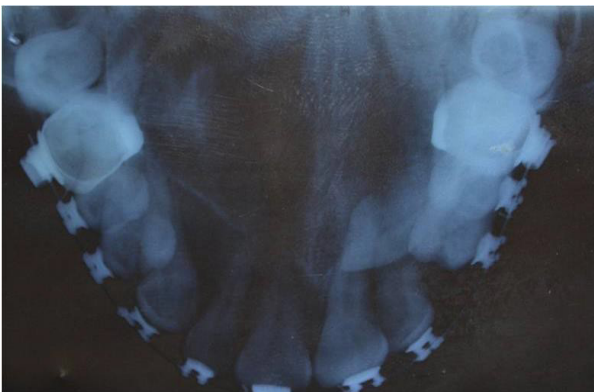


FIG:9



FIG:10

DISCUSSION

The canine is considered as the corner stone of the maxillary arch. It has a long root and good bony support, which is advantageous in lateral excursions and it can also serve as an excellent abutment for fixed and removable prosthesis. A canine can be palatally impacted if an extra space is available in the maxilla. This space can be provided by excessive growth in the base of maxillary bone, space created by peg shaped lateral incisors or stimulated eruption of lateral incisor or first premolar.

Two major theories have been proposed to explain the cause for canine impaction. They are the guidance theory and the genetic theory. According to the guidance theory, excess space in the canine area of a dental arch during eruption due to a malformed lateral incisor root, could cause the canine to lose its way and erupt improperly.[8] The genetic theory states that multiple gene expressions could cause dental anomalies in lateral incisors.[9] These factors could affect the eruption status of canine.

The possible complications of an impacted canine includes, loss of arch length, cyst formation, internal resorption of the impacted tooth and external resorption of the neighbouring tooth.[10] Treatment strategy for impacted canine, depends on the proximity of the tooth to line of arch, its position in maxilla and also patient's motivation. There are many approaches available for managing impacted canine like interceptive removal of primary canine, no treatment but with periodic evaluation for pathologic changes and surgical removal of impacted canine and prosthetic replacement. But the most desirable approach is surgical exposure of canine followed by orthodontic treatment to bring the tooth into line of occlusion.

Computerized image reconstruction produces 3D images at high resolution. CBCT was helpful to identify and locate the position of impacted canines accurately. CBCT eliminates the problems with magnification and superimposition which makes interpretations with conventional radiographs challenging. We used CBCT for assessing the accurate location of impacted canine for the first case and we managed with IOPA and occlusal radiographs in the second case.

Most widely used surgical techniques for exposing palatal canine impactions are closed eruption technique [11] and open window eruption technique. [12] For the first case we followed open window eruption technique, flap is raised and excised and minimal amount of bone is removed enough to expose the part of crown. The advantage of this technique is that, since the orthodontic attachment can be bonded later after the removal of the periodontal pack, the bond strength is better than bonding on the day of surgery.[13]

For the second case we followed closed eruption technique, an attachment is bonded to the surgically exposed crown and the flap sutured back over the crown leaving the twisted wire to apply the orthodontic traction. We followed the closed eruption technique, since some authors reported excellent periodontal health, following alignment of canines using this technique.[14,15]

During the postsurgical phase, both the patients were found to be equally comfortable. But the patient on whom the open window was performed, appeared to have taken a longer recovery time, compared to his counterpart. The periodontal health status around the erupting canines in both the patients was found to be equally good. Both the patients are continuing to undergo orthodontic treatment to facilitate the canines to occupy a more buccal position in the arch. Conclusion :

It can be concluded that the etiology of canine impaction is multifactorial and the treatment options also depend on local anatomic and patient related factors. Using advanced diagnostic aids like CBCT is helpful in diagnosis and management of impacted canines.

REFERENCES

1. Power SM, Short MB. An investigation into the response of palatally displaced canine to the removal of deciduous canines and an assessment of factors contributing to a favourable eruption. *Br J Orthod* 1993;20: 215-23.
2. Thailander B, Jackobsson SO. Local factors in impaction of maxillary canines. *Acta Odontol Scand* 1968; 26: 145-68.
3. Ericson S, Kurol J. Radiographic examination of ectopically erupting maxillary canines. *Am J Orthod Dentofacial Orthop* 1988; 91: 483-92.
4. Bishara SE. Impacted maxillary canines: a review. *Am J Orthod Dentofacial Orthop* 1992; 101:159- 71.
5. Liu DG, Zhang WL, Zhang ZY, Wu YT, Ma XC. Localization of impacted maxillary canines and observation of adjacent incisor resorption with cone-beam computed tomography. *Oral Surg mOral Med Oral Pathol Oral Radiol Endod* 2008;105(1):91-98.
7. Rimes RJ, Mitchell CNT, Willmot DR: Maxillary incisor root resorption in relation to the ectopic canine: a review of 26 patients. *Eur J Orthod* 1997; 19: 75-84.
8. Wennstrom JL. Mucogingival therapy. *Ann Periodontol* 1996; 1: 671-701.
9. Brin I, Becker A, Shalhav M. Position of maxillary permanent canine in relation to anomalous or missing lateral incisors: a population study. *Eur J Orthod* 1986; 8: 12-6.
10. Peck S, Peck I, Kataja M. Concomitant occurrence of canine malposition and tooth agenesis: evidence of orofacial genetic fields. *Am J Orthod Dentofacial Orthop* 2002; 122: 657-60.
11. Erickson BE. Impactions a n d pseudoimpactions. *Am J Orthod*. 1939; 24: 1019.
12. Lewis PD. Preorthodontic surgery in the treatment of impacted canines. *American Journal of Orthodontics* 1971;60(4):382-97.
13. Clark D. The management of impacted canines: free physiologic eruption. *Journal of the American Dental Association* 1971;82(4): 836-40.
14. Becker A, Shpack N, Shteyer A: Attachment bonding to impacted teeth at the time of surgical exposure. *Eur J Orthod* 18:457-463, 1996.:
15. Crescini A, Nieri M, Buti J, Baccetti T, Mauro S, Prato GP. Short and long-term periodontal evaluation of impacted canines treated with a closed surgical-orthodontic approach. *Journal of Clinical Periodontology* 2007;34(3):232-42.
16. Quirynen M, Op Heij DG, Adriansens A, Opdebeeck HM, van Steenberghe D. Periodontal health of orthodontically extruded impacted teeth. A split-mouth, long-term clinical evaluation. *Journal of Periodontology* 2000;71(11):1708-14.