Case Report

Management of Bilaterally Impacted Canines: A Case Report and Review.

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ABSTRACT

Canines are the second most common teeth subjected to impaction next to 3rd molars. Unlike 3rd molars where extraction will be the chief treatment approach, canines being considered as cornerstone teeth in the dental arch and plays an main role in esthetics and function, so different treatment techniques should be selected to preserve and align then in the arch with smile enhancement. Furthermore, treatment selection for impacted canines depends on several factors such as patient compliance, age and canine position. Therefore, the present paper discusses the management of impacted canines in a 14 year old girl by orthodontic therapy and a brief literature review regarding impacted canines.

Key words: Canine Impaction, non-extraction, bilateral canine impaction, Maxillary canine impaction.

INTRODUCTION

Impacted canines are those with delayed eruption time or that are not expected to erupt completely based on clinical and radiographic assessment.[1] Abnormal and long eruption path of canines within the dentoalveolar process may result in its impaction and serious clinical consequences.[1] Canines are the most commonly impacted teeth next to third molars positioned either buccal or palatal in direction.[2] Palatally impacted canines are more common and difficult to treat than bucally impacted ones and the main cause for buccally erupted teeth is mostly due to arch length tooth material discrepancy or retained deciduous teeth.

Canines being considered as the cornerstones of the dental arch have a strategic position at the angle of the arch. Canines are responsible for the maintenance of harmonious occlusal symmetry. Thereby, lack of canine guidance has negative consequences on TMJ and on adjoining teeth.[3,4] Due to the vital position of canines in the dentition; preservation of the tooth is the best alternative to extraction for maintaining functional and esthetic integrity of the dental arch.[5] Treating an impacted canine poses a challenge to the dentist than any other dental anomalies and esthetic outcome is unpredictable if it is not planned suitably. The present paper describes an comprehensive orthodontic treatment of the patient with bilaterally impacted maxillary canine with cross bites irt 12, 22 and literature review of the same.

CASE REPORT

2.1 Diagnosis and Etiology

A south Indian girl aged 14 years, accompanied by her parents came to the department of orthodontics and dentofacial orthopaedics with a chief complaint of “irregularly placed upper front teeth.” It was her first dental visit and no significant past dental and medical history was evident. On examination, extra orally, patient had a mild convex profile with acute nasolabial angle and non-consonant smile. Intraorally, early permanent dentition, Class I malocclusion, 2mm of overjet, 4mm of deep overbite (33%), crowding in upper and lower anteriors with bucally impacted 13, 23 and crossbite irt to 12,43,22,33 were present **(Figure 1).** Orthopantomogram **(Figure 2)** and lateral cephalometric radiograph are the radiological investigations advised. On radiographic interpretation, a skeletal Class II relationship (SNA, 78∘; SNB, 73∘;ANB, 5∘) and vertical growth pattern (SNGoGn∘, 37∘) with incisors proclined (1.NA, 31∘; 1.NB, 29∘; IMPA,102∘)**.** At this point, the canines were considered impacted as root formation is complete; hence, orthodontic intervention is needed to align the canines into arches.

2.2 *Treatment Objectives*

The treatment plan was to carryout non-extraction orthodontic procedure depending on amount of space available in the arch. Application of wait and watch principle after the extraction of retained deciduous canines for the possibility of proper self-alignment.

1.3.*Treatment Progress*

The treatment was initiated by extraction of retained deciduous canines 53, 63 and was kept under observation for a month to allow self-correction of canines by change in direction of eruption. After one month canines erupted into oral cavity ectopically, then orthodontic attachments were bonded and orthodontic force is applied to align the canines into the arch. Initially bonding was done with 0.022 MBT system on all teeth expect maxillary canines and maxillary lateral, begg brackets were placed on 13, 22 and 23. Anchorage was reinforced using transpalatal arch. Posterior bite block was used to relieve

occlusion so as to correct the anterior cross bites. Force is applied top canines from molar buccal tubes and canines were tipped so that crowns move in one direction and roots in other **(Figure 3)**. Once the canine tipped sufficiently begg brackets were replaced with MBT system brackets and aligned into the arch using archwires.

1.4.Treatment Results

At the end of treatment class I molar and canine relation were established on right side and end on end relation on left side **(Figure 4).**

DISCUSSION

Participants

Defining an impacted tooth, it is a tooth which has failed to erupt completely or partially to its correct position in the dental arch and has lost its eruption potential.[2] Maxillary as well as mandibular canines may be impacted but occurrence of mandibular canine impaction is infrequent.[6]

The prevalence of canine impaction has been reported to be 1–2.5% in the general population.[1] In India, prevalence ranges from 2.9% to 9.7%.[7,8] Impacted palatal maxillary permanent cuspids accounts for 85% whereas only 15% are buccal impactions.[9,10]

Etiology can be generalized and localized ones, where generalized causes have been attributed to syndromes and systemic factors, including hypopituitarism, hypothyroidism, cleidocranial dysostosis, Down syndrome, achondroplasia, hypovitaminosis (A or D), osteopetrosis and amelogenesis imperfect. Local factors are the most common etiology and includes tooth size/arch length discrepancy, abnormal position of the tooth bud, prolonged retention or early loss of the primary canine, follicular disturbance and cyst or neoplasm formation and the long path of eruption, presence of an alveolar cleft, dilacerations of the root or trauma and idiopathic factors including primary failure of eruption.[11,12]

Longer path of development can be attributed for the impaction as it develops high in the maxilla with calcification beginning 4–12 months postnatally and crown completion at 6–7 years of age. By the age of 21/2 years, the tooth germ of the permanent maxillary canine lies above the first premolar toothbud and from this position, the maxillary canine has a long and deviational path to cover. Overall, the canine travels nearly 22 mm from its position at the age of 5 years to its position at the age of 15 years.[12] The most accepted theories that explain the impaction of canines are the guidance theory and the genetic theory; others will be the sequential theory.[13]

Diagnosis of impacted canines can be made clinically as well as radiographically. As early as they can be detected clinically by intaoral clinical examination that includes palpation of canine bulges, mobility of primary canines, and chronological age and history of eruption/exfoliation patterns of the dentition. Radiographic examination includes use of periapical, panoramic, occlusal and were performed once the clinical diagnosis evaluation was done. Lateral cephalometric and posterioanterior radiographs whereas CBCT is of greater value. Periapical radiographs can be used at different angles to determine the buccolingual position and the commonly used methods that are widely used are Clark's rule and the buccal object rule.[13]

The management of impacted canines can be divided into 2 types namely interceptive and corrective. In interceptive orthodontics, extraction of the primary canine is thought to sequential alignment of the impacted canine. Ericson and Kurol (1988)[14] conveyed that extraction of the primary canines between 10 to 13 years of age will acquire a favorable outcome for palatal impacted canines and If the cusp tip of a permanent maxillary canine in the panoramic radiograph does not cross the midline of the lateral incisor, the chance of the canine erupting normally is 91% and if it crosses, the chance for normally erupting lowers to 64%. Modifications in addition to the extraction of primary canines include the use of cervical pull headgear, double extraction of the primary canine and the primary first molar, the use of a transpalatal arch (TPA), and TPA in combination with rapid palatal expansion.[13,15,16]

Figure 1: Pre Treatment Intra Oral Photographs

Figure 2: Pre Treatment & Post Treatment OPG

Figure 3: During Treatment

Figure 4: Post Treatment Intra Oral Photographs

Corrective treatment is performed when interceptive methods cannot be applied or failed to attain the expected results and depends upon the type of impaction, whether palatal or buccal. Kokich (2004)[17] proposed a technique for uncovering a labially unerupted maxillary canine that includes gingivectomy, apically positioned flap, and closed eruption technique. Orthodontic mechanics were applied to guide the canine through the center of the alveolus with light and continuous (<60gm) force. Several auxiliaries are designed for applying tractional force to the bonded attachment such as Monkey hook, Kilroy spring and Balista spring.[2]

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