CASE REPORT

A CASE REPORT OF SURGICALLY ASSISTED ORTHODONTIC MANAGEMENT OF IMPACTED PERMANENT MAXILLARY CENTRAL INCISOR.

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ABSTRACT

After the third molars and the maxillary canines, maxillary central incisors are the third most frequently impacted permanent teeth.Successful treatment outcomes can be determined only through awell-planned and carefully executed orthodontic and surgical treatment.This paper describes a case report of a 14-year-oldmale patient who reported at the Department of Orthodontics of Dr. R Ahmed Dental College & Hospitalwith the chief complaint of a missing upper front tooth. Clinical examination showsa missing maxillary central incisor on the left side with mesially tipped adjacent lateral incisor.The patient was planned to be treated with non-extraction treatment, surgical exposure of the impacted central incisor followed by traction,alignment, and levelling of the arch.

KEY WORDS

Impaction, Orthodontic, Permanent maxillary central incisor, Surgical exposure, Traction.

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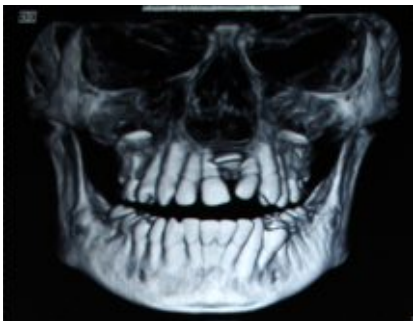
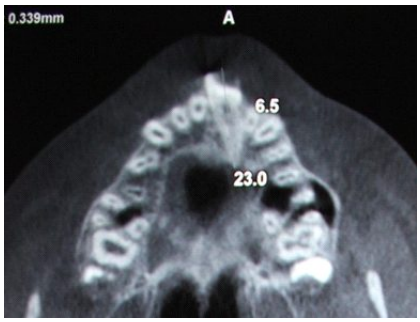
INTRODUCTION

The prevalence of permanent central incisor impaction is 0.06%[1].The impaction of the tooth may be a retardation or halt within the normal process of eruption. According to Kuftinec and Shapira, impaction is a condition in which a tooth is embedded in the alveolus so that its eruption is impeded, and it is locked in position by bone or by adjacentteeth[2]. In today's perspective, 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"[3]. Diagnosis of an impacted central incisor usually occurs during the mixed dentition period as it erupts when the child is 8-10 years [4]. The etiology of tooth impaction is multifactorial, typically involving genetic and environmental factors such as lack of space in the dental arch, an abnormal frenulum, prolonged retention of deciduous teeth, abnormal eruptive path, ankylosis, supernumerary teeth, tumors, cysts, or trauma[5]. The impaction of permanent maxillary central incisor possesses a problem at an earlier age as it compromises the facial aesthetics. Abnormalities involving the morphology, pattern or absence of these teeth affect the self esteem of the patient adversely. Impaction of the maxillary central incisor is almost as prevalent as impaction of the canines but with different etiology.

CASE REPORT

A 14-year-oldmale patient came to Department of Orthodontics and Dentofacial Orthopedics, Dr. R. Ahmed Dental College & Hospital with chief complaint of missing upper front tooth and wanted to get treatment done for the same. Extraoral examination reveals mesoprosopic facial form with mildconvex profile with competent lips. Intraorally there is clinically missing 21, mesially tipped 22, crowding in lower arch, palatally placed 15, labially placed 34, 2.5mm overjet and 3.5 mm of overbite with midline shift of 2mm to the left. Radiographically there was impacted upper left permanent central incisor. OPG & CBCT radiographs were taken to locate the position and morphology of the impacted central incisor.





Pre-treatment CBCT

Pre treatment OPG

Pre treatmentlateral ceph

Extraoral photographs.

Pre-Intraoral photographs

DIAGNOSIS

A 14-year-old male patient with Angle's class I malocclusion on class II skeletal base (ANB 7^0) with average growth pattern (59^0), impacted 21, mesially tipped 22 with 2.5mm of overjet, 3.5mm of overbite, and convex profile.

TREATMENT OBJECTIVES

(1) To surgically expose 21 followed by clinical traction of11 and bring it to the arch.

(2) To maintain the class I molar relation and class I canine relation bilaterally.

(3) To attain normal overjet and overbite.

(4) To correct the crowding and alignment of both arches.

(5) To attain lip competency.

(6) To improve the smile, aesthetics and overall appearance.

TREATMENT PLAN

After discussing all the possible treatment alternatives, a conservative treatment approach was opted to bring the tooth into its proper position. The treatment plan consisted of orthodontic space opening, surgical exposure, and traction of the impacted left central incisor down to its normal position followed by levelling and alignment.

TREATMENT PROGRESS

Patient was treated with fixed mechanotherapy using Pre-adjusted Edgewise MBT 022 Slot Brackets, to achieve proper alignment and levelling of the maxillary and mandibular arch. A coil spring was placed to create space for impacted tooth once the maxillary arch was in a rigid stabilizing wire (0.019X 0.025- stainless steel wire in a 0.022-in slot. During Surgery a circular incision was made to expose the tooth, a bondable begg's bracket was placed on the exposed incisor, elastic chain was placed to that begg's bracket for applying traction in the occlusal direction. Once the impacted tooth had sufficiently erupted, a bracket was bonded to the crown and tied to a double arch wire (0.014-in nickel-titanium). In the mandibular arch, alignment and leveling were achieved with a sequence of 0.014 and 0.018-in nickel-titanium archwires, later replaced by rectangular nickel-titanium archwires (0.017 X0.022 and 0.019 X0.025 in).

ANCHORAGE REQUIREMENT

Banding of all permanent second molars.

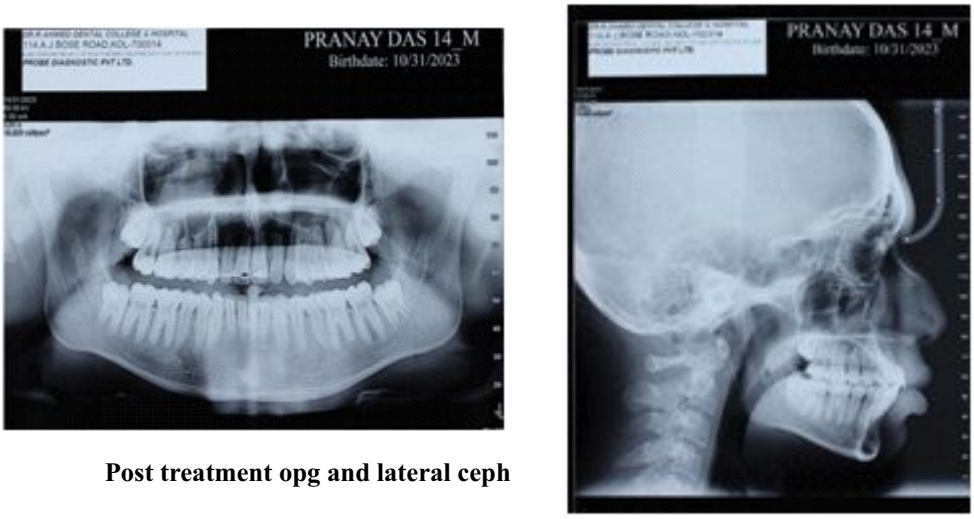
RETENTION PROTOCOL

Upper and lower fixed flexible spiral retainer

Photos of surgical exposure

Post treatment extra oral photographs

Post treatment intraoral Photographs



Post treatment opg and lateral ceph

TREATMENT RESULTS

The impacted tooth was brought into proper alignment with the adjacent teeth. Facial esthetics was enhanced with a beautiful smile. Bilateral Class I molar, canine and incisal relationships were achieved with ideal overjet and overbite and adequate intercuspation and coinciding midlines. At 6months follow up the incisor remained vital and responded normally to percussion and sensitivity tests. An adequate amount of attached gingiva was obtained.

DISCUSSION

An impacted central incisor is usually diagnosed, when there is a delay in the eruption of the tooth. It normally erupts around 6-7 years of age. The most important step in the management of impacted tooth is the diagnosis and localization of the tooth. This tooth constitutes a major component of the esthetics of a smile. Abnormalities involving themorphology, position or absence of these teeth may affect a patient's self-esteem adversely[6].The factors that can predict the successful alignment of an impacted tooth are (1) the position and direction of the impacted tooth (2) the degree of root completion, (3) the degree of dilacerations, and (4) the presence of space for the impacted tooth[7-12]. Here, the adjacent lateral incisor has tipped mesially creating space problem. Delaying the Orthodontic-surgical intervention creates unnecessary difficulties in aligning the tooth in the arch[13]. In this case, closed eruption technique was planned. Adequate space should be created before giving traction forces to the impacted tooth. The intensity and orientation of the force vectors of orthodontic traction was planned to provide gradual tooth movement. The working wire should be rigid stainless wire during traction in order to prevent the unwanted effects on the neighbouring dentition.

CONCLUSION

The orthodontic-surgical treatment of impacted incisors is generally successful but relatively long.

The treatment requires multidisciplinary approach. Patients and parents should be warned about the risk of failure. For the maxillary central incisor, the option of traction is often undertaken because of its important role in esthetics. However, gingival recession associated with long clinical crowns should be taken care of. Otherwise, subsequent periodontal and esthetic problems will follow.

Consent – Taken from the patient.

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