IMPACTED MAXILLARY CENTRAL INCISOR: A CASE REPORT

A Case Report

Dr. Sonali Mahadevia*, Dr. Bhavya Trivedi**, Dr. Richa Vakil***

ABSTRACT

This case report describes the treatment of a patient with a vertically impacted maxillary central incisor having Class I molar relationship on either side. a 2-stage treatment plan was planned. In the first stage, enough space for the eruption of the maxillary left permanent incisor was created. The second stage included surgical exposure and traction of the impacted central incisor with a fixed orthodontic appliance. An excisional uncovering technique was needed to expose the impacted incisor. Traction was given in this exposed crown surface to achieve eruption and bring it into alignment.

Keyword: impaction, orthodontics, cbct

INTRODUCTION:

Impaction of a permanent central incisor is not as common as that of a maxillary canine. The impaction of the maxillary central incisor manifests itself at an early age.[1] This tooth usually erupts several years before the canine, when the child is between 8 and 10 years of age, and its impaction is more conspicuous to the parents.[2]

The principal factors involved in impaction of central incisor are supernumerary teeth, odontomas and trauma. There are other alternatives for treatment of impacted central incisor which include extraction, restoration with a bridge, implant, extraction followed by space closure and surgical exposure, orthodontic space opening, and traction of the impacted central incisor into its proper position.[10,11] however surgical exposure and positioning impacted tooth in line of occlusion provides the best method for naturally restoring the missing tooth. There are some factors which might enhance the outcome of the orthodontic-surgical plan for the ultimate outcome of impacted central incisors but, particularly, the manner in which the impacted tooth is exposed. Impacted teeth can be exposed by reposition or else removal of soft tissue envelope and afterward leaves tooth in full view or a part of it, at the end of the surgical exposure. This has been termed "open-eruption" exposure. Removal of soft tissue overlying an unerupted tooth, although more direct, has disadvantage that at the end of treatment the erupted tooth will have a nonkeratinized labial gingival margin, on the other hand, apical repositioning can be expected to provide adequate width of the attached gingiva. With a bonded attachment, an extrusive force can be applied to augment the diminished natural eruptive force.[13-15]

DIAGNOSIS AND ETIOLOGY

An 18-year-old boy with chief complaint of missing upper left central incisor having all other permanent teeth (except third molars)in the arch (Figs 1 and 2). On evaluation he had a balanced facial pattern. The maxillary left central incisor was impacted, and the adjacent teeth had drifted into the unoccupied space. There was Class I molar relationship. Overjet was 3 mm and overbite 4 mm. The patient had a history of trauma at age 10. Radiographs showed that the maxillary left central incisor was impacted in a vertical position in the region of the nasal floor. (Fig 3)

Fig 1. Pretreatment extraoral photographs

*Head Of the Department, **Professor, ***PG Student

DEPARTMENT OF ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS AHMEDABAD DENTAL COLLEGE AND HOSPITAL

ADDRESS FOR AUTHOR CORROSPONDENCE : DR. RICHA VAKIL, E-mail : richavakil@gmail.com

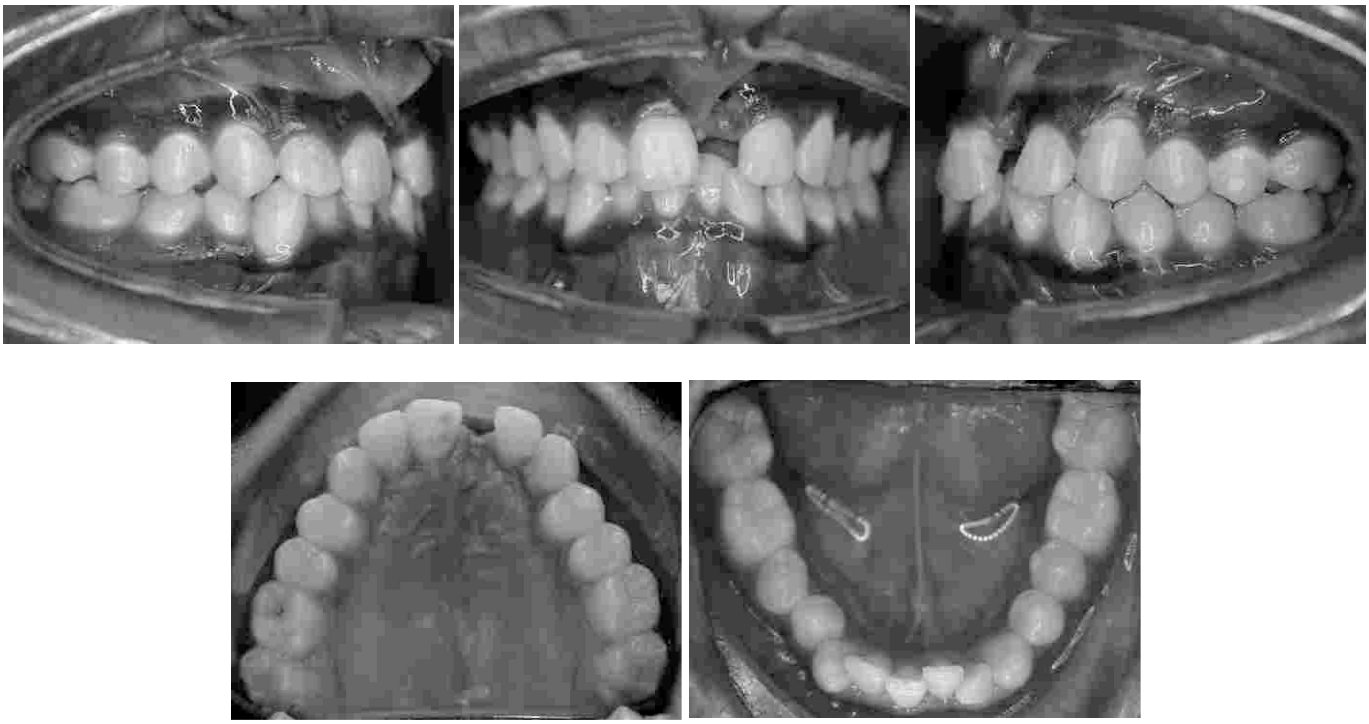

Fig 2. Pretreatment intraoral photographs

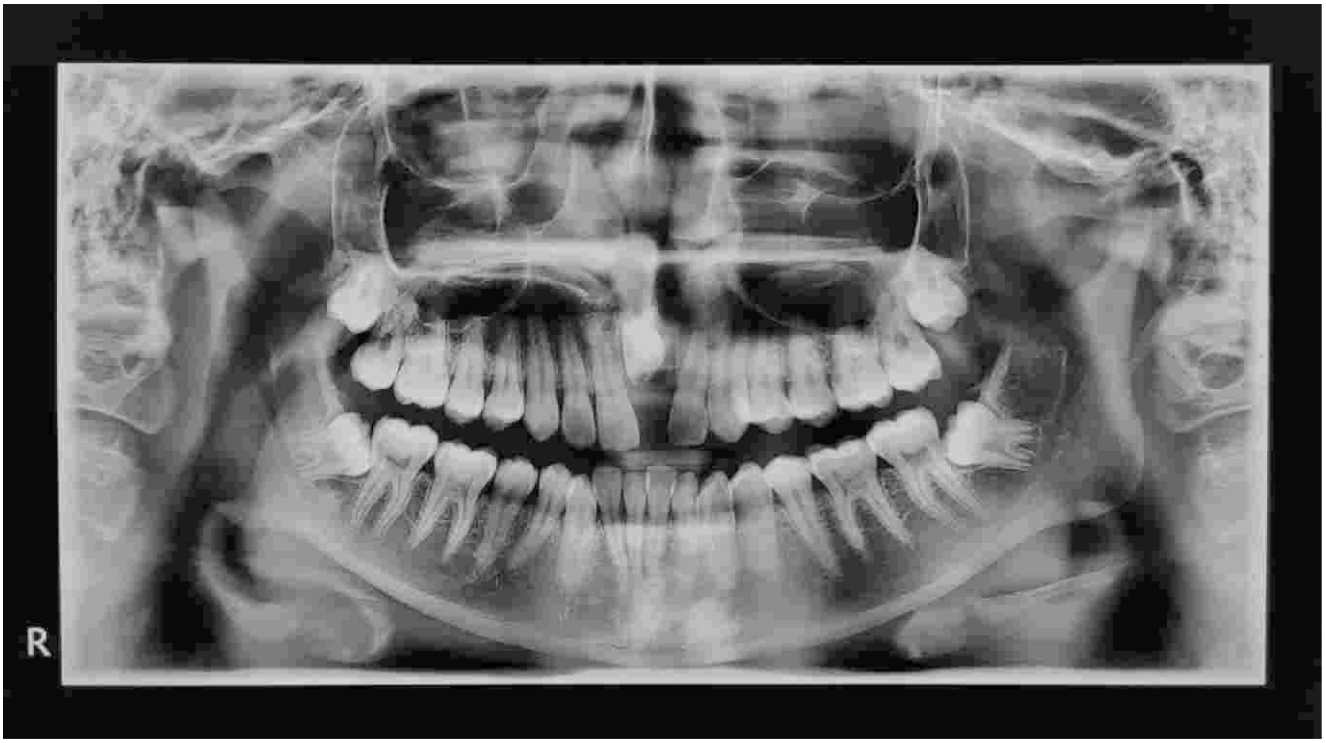

Fig 3. Pretreatment panoramic x-ray

TREATMENT OBJECTIVES

The following treatment objectives were established:
(1) recover space in the maxilla for the eruption of the left incisor,
(2) provide orthodontic traction for the impacted tooth,
(3) create a stable functional occlusion, and
(4) establish adequate attached gingiva and
symmetric gingival margins for both maxillary central incisors.

TREATMENT PLAN

After discussing the possible treatment alternatives, the parents and the clinicians chose to try to save the tooth and bring it into its proper position. The treatment plan consisted of 2 stages.
In the first stage, enough space for the eruption of the maxillary left permanent incisor. The second stage included surgical exposure of impacted central incisor followed by traction.

TREATMENT PROGRESS

After the bands or brackets were placed on all teeth. Once the maxillary arch was in a relatively rigid stabilizing wire (0.019-in × 0.025-in stainless steel in a 0.022-in slot), a coil spring was used to create adequate space for aligning the impacted incisor. A surgery was performed to expose the maxillary left central incisor (Fig 4).
A flap was elevated to expose the tooth, and it was necessary to bond an attachment on the buccal surface of the incisor to tie it to a 0.010-in ligature wire and bond it to an elastic module for applying force in the apical direction. Once the impacted tooth had erupted, a bracket was bonded to the crown and tied to archwire (0.014-in nickel-titanium). In the mandibular arch, alignment and leveling were achieved with a sequence of 0.014-in and 0.016-in nickel-titanium archwires, later replaced by rectangular nickel-titanium archwires (0.017-in×0.025-in).

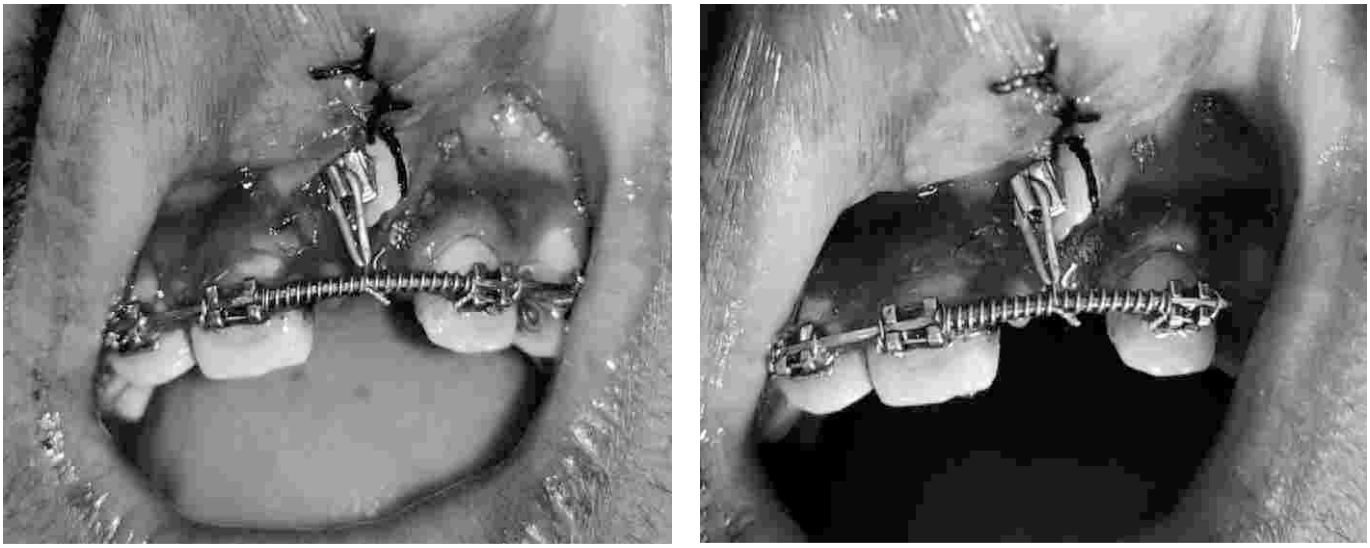

Fig 4. Surgical Exposure

Active treatment is being done since 12 months. CBCT, Photographs, dental casts and panoramic and cephalometric radiographs were taken at the beginning of the treatment.
(Fig 5. CBCT).

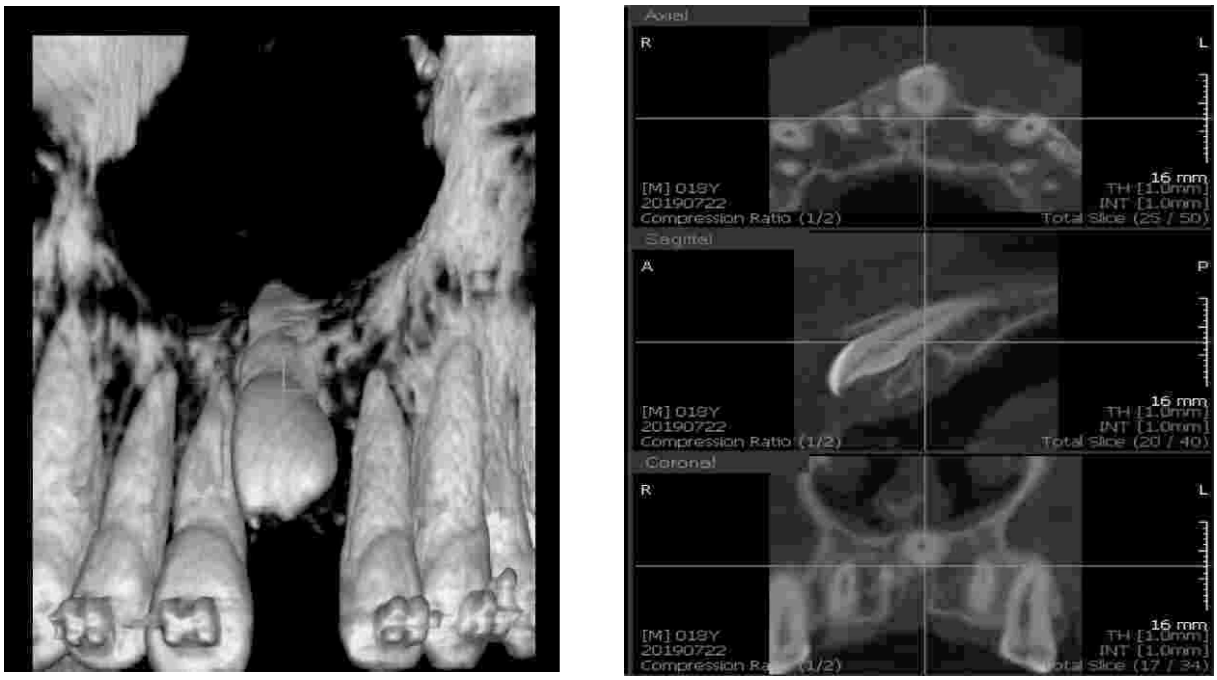

Fig 5. CBCT

TREATMENT RESULTS

The impacted maxillary left central incisor crown is completely visible in oral cavity. Tooth is now bonded with bracket and engaged in continuous niti wire. Bilateral Class I canine relationships and ideal overjet and overbite are being achieved. (Fig 6. Present stage)

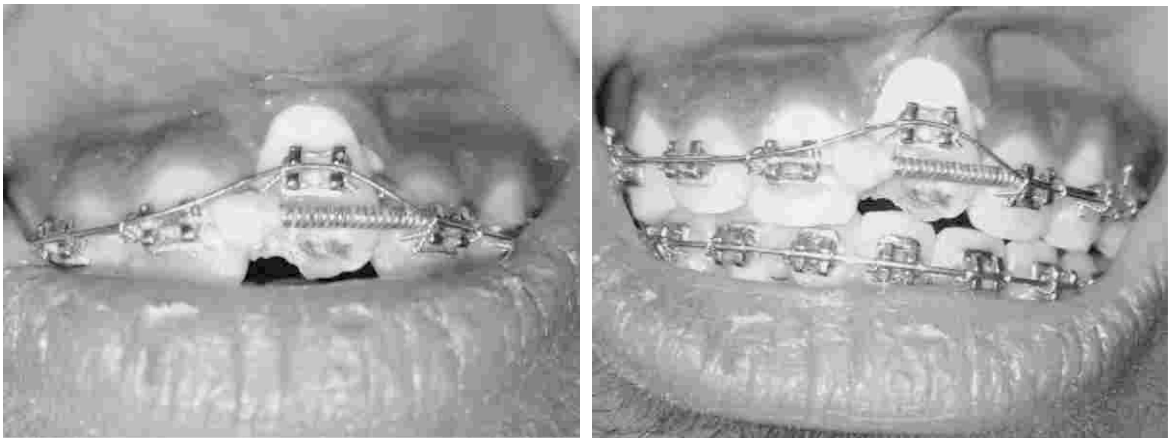

Fig 6. Present stage

DISCUSSION

An impacted maxillary central incisor in a teenager poses a disturbing esthetic dilemma because of its prominent location. Neither orthodontists nor parents want to wait for starting orthodontic treatment. However, it is important to properly inform the patient and the parents of the possibility of failure. Although the panoramic radiograph cannot be used as the sole radiograph to locate impacted maxillary tooth, in this patient, we diagnosed exact location and depth of impaction with help of CBCT radiograph.

We first determined whether the impacted tooth could be successfully aligned in its proper position on the basis of its position and orientation, the amount of root formation, and the degree of root dilaceration.[11] It is important to plan when and how the impacted tooth will be moved to its proper position, as well as the positions of adjacent teeth and the intermaxillary relationships. In this

patient, there was insufficient space for the maxillary left central incisor; the lateral incisors had drifted into the unoccupied space. There is relatively high prevalence of gingival defects, so that adjunctive post orthodontic periodontal treatment might be required in some cases treated with this method to achieve an esthetic gingival margin contour over the central incisor and provide the teeth with an adequate zone of attached gingiva.[1,16]

REFERENCES

1) Becker A, Brin I, Ben-Bassat Y, Zilberman Y, Chaushu S. Closed-eruption surgical technique for impacted maxillary incisors: a postorthodontic periodontal evaluation. American journal of orthodontics and dentofacial orthopedics. 2002 Jul 1;122(1):9-14.
2) Crawford LB. Impacted maxillary central incisor in mixed dentition treatment. American journal of orthodontics and dentofacial orthopedics. 1997 Jul 1;112(1):1-7.
3) Brin I, Becker A, Shalhav M. Position of the maxillary permanent canine in relation to anomalous or missing lateral incisors: a population study. The European Journal of Orthodontics. 1986 Feb 1;8(1):12-6.
4) Pinho T, Neves M, Alves C. Impacted maxillary central incisor: surgical exposure and orthodontic treatment. American Journal of Orthodontics and Dentofacial Orthopedics. 2011 Aug 1;140(2):256-65.
5) Jacobs SG. The impacted maxillary canine. Further observations on aetiology, radiographic localization, prevention/interception of impaction, and when to suspect impaction. Australian dental journal. 1996 Oct;41(5):310-6.
6) Jacoby H. The etiology of maxillary canine impactions. American journal of orthodontics. 1983 Aug 1;84(2):125-32.
7) Bass TB. Observations on the misplaced upper canine tooth. The Dental practitioner and dental record. 1967 Sep;18(1):25.
8) Oliver RG, Mannion JE, Robinson JM. Morphology of the maxillary lateral incisor in cases of unilateral impaction of the maxillary canine. British journal of orthodontics. 1989 Feb;16(1):9-16.
9) Millar BJ, Taylor NG. Lateral thinking: the management of missing upper lateral incisors. British Dental Journal. 1995 Aug;179(3):99.
10) Lin YT. Treatment of an impacted dilacerated maxillary central incisor. American journal of orthodontics and dentofacial orthopedics. 1999 Apr 1;115(4):406-9.
11) Tanaka E, Hasegawa T, Hanaoka K, Yoneno K, Matsumoto E, Dalla-Bona D, Yamano E, Suekawa Y, Watanabe M, Tanne K. Severe crowding and a dilacerated maxillary central incisor in an adolescent. The Angle Orthodontist. 2006 May;76(3):510-8.
12) Frank CA. Treatment options for impacted teeth. The Journal of the American Dental Association. 2000 May 1;131(5):623-32.
13) Becker A. Orthodontic treatment of impacted teeth. John Wiley & Sons; 2012 Apr 23.
14) Kokich VG, Mathews DP. Surgical and orthodontic management of impacted teeth. Dental Clinics of North America. 1993 Apr;37(2):181-204.
15) Vanarsdall RL, Corn H. Soft-tissue management of labially positioned unerupted teeth. American journal of orthodontics. 1977 Jul 1;72(1):53-64.
16) Chaushu S, Brin I, Ben-Bassat Y, Zilberman Y, Becker A. Periodontal status following surgical–orthodontic alignment of impacted central incisors with an open-eruption technique. The European Journal of Orthodontics. 2003 Dec 1;25(6):579-84.