

## Early Intervention Orthodontics for an Impacted Maxillary Central Incisor: A Case Report

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### Case Report

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**Abstract:** Impaction of maxillary central incisors are only seldom encountered in clinical practices. Impaction of permanent anterior teeth results in both aesthetic impairment and functionally compromised occlusion. Careful planning and interdisciplinary approach are required for the successful management of impacted central incisor. The present case report highlights a case where patient reported with a missing left central incisor, at the age of 9 years and 2 months. A palpable crown prominence on labial gingival mucosa in the vestibule was suggestive of the impacted maxillary central incisor. On Cbct examination 21 was located below the nasal floor with long axis of the tooth near parallel to palatal plane. The crown of the impacted 21 faced labially at the level of middle third of the root of 11. The root formation was incomplete. The crown of the impacted teeth was exposed with the help of a diode laser under LA. A lingual button is bonded on the palatal surface of the exposed crown. PAE brackets are bonded to 12, 11 and 22 with slot alignment. E- thread is tied from the monkey loop from the attachment of exposed crown to the 0.018 special Australian base archwire. Traction was progressively continued till a PAE bracket could be bonded followed by a piggy back traction by 0.014 Niti. Case was finished with disimpacted 21 in alignment with the arch. Disimpaction and alignment of incisor achieved by a minimally invasive technique was successful and showed good stability.

**Keywords:** Disimpaction, Maxillary central incisor, Early intervention.

## INTRODUCTION

Impaction of maxillary central incisors is only seldom encountered in clinical practices with a low prevalence rate of 0.06% to 0.2% [1]. The delay in eruption of the tooth more than 6 months from the contralateral central incisor and even after eruption of adjacent lateral incisor is an anomalous outcome. Impactions are rarely diagnosed in mixed dentition period. However, central incisor impactions are an exception to this as its non- emergence can be easily noticed by parents, paediatricians and pedodontist owing to its importance in facial esthetics [2]. Central incisor impaction may result from a number of local and systemic factors [3]. Over-retained deciduous teeth, supernumerary teeth, or ectopic eruption and crowding are the most common etiological factors for impacted central incisors. Impactions caused by disturbances in the eruption path related to crowding are somewhat less common.

Careful planning and interdisciplinary approach are required for the successful management of impacted central incisor. Impaction of permanent anterior teeth results in both aesthetic impairment and functionally compromised occlusion.

Successful management of impacted central incisor is a critical aspect, in the orthodontic treatment as it can possibly get complicated with chances of ankylosis, loss of attachment, external root resorption, and root exposure [4].

## CASE REPORT

The present case report highlights a case where patient reported with a missing left central incisor, at the age of 9 years and 2 months with a palpable crown prominence on labial gingival mucosa in the vestibule. The age of presentation is significant as it is in the period of normal development of the central incisor and prior to the formation of adjacent teeth. An impacted central incisor with developing root is one of the favourable factors in bringing the tooth into occlusion, by redirecting the eruptive forces. The following case report discusses the diagnostic and treatment challenges with the impacted maxillary central incisor.

## History and Diagnosis

A 9-year-old male child presented to the Department of Orthodontics with a chief complaint of non eruption of upper front teeth. The child was

physically healthy and had no relevant medical or dental history with no recall of significant trauma.



**Fig-1: Pretreatment photographs**

**Clinical examination**

A well balanced symmetrical face with a convex profile was noted.

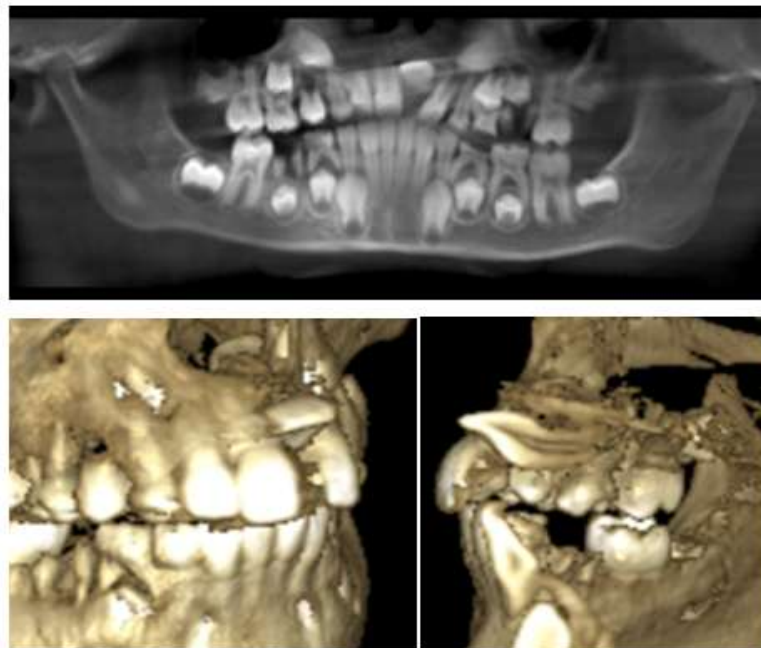
On intral-oral examination, the patient presented with a mixed dentition. A projection on the labial gingival borders could also be seen with a

palpable bulge, suggestive of the impacted maxillary central incisor.

Patient also presented with multiple carious teeth with root stumps of 65 and 85.

**Model Analysis**

Tanaka Johnston analysis showed no expected crowding in any quadrant.



**Fig-2: Pretreatment OPG and CBCT sections**

### Radiographic examinations

The panoramic radiograph demonstrated impacted 21 with no associated pathology.

On Cbct examination 21 was located below the nasal floor with long axis of the tooth near parallel to palatal plane. The crown of the impacted 21 faced labially at the level of middle third of the root of 11. The root formation was incomplete.

### Treatment Objectives

- To disimpact 21 followed by levelling and alignment

- To restore all carious teeth
- Maintaining arch length with space maintainers post extraction of all root stumps.

### Treatment Plan

Surgical exposure of impacted tooth and orthodontic traction for a guided eruption of 21 seemed to be the best plan for the presented case. A comprehensive treatment executed in department of pedodontics for the care of all carious tooth and space maintenance which included restorations on 64, 75; stainless crown on 64 and 74; extraction 84 and 85 followed by lingual arch space maintainer.



Fig-3: Crown exposure with diode laser.

### Treatment course

The patient was referred to the department of periodontics for exposure of the impacted incisor. The crown of the impacted teeth is exposed with the help of a diode laser under LA. A lingual button is bonded on the palatal surface of the exposed crown. PAE brackets are bonded to 12, 11 and 22 with slot alignment. E-

thread is tied from monkey loop from the attachment of exposed crown to the 0.018 special Australian base archwire. Traction was progressively continued till a PAE bracket could be bonded followed by a piggy back traction by 0.014 Niti. Case was finished with disimpacted 21 in alignment with the arch.

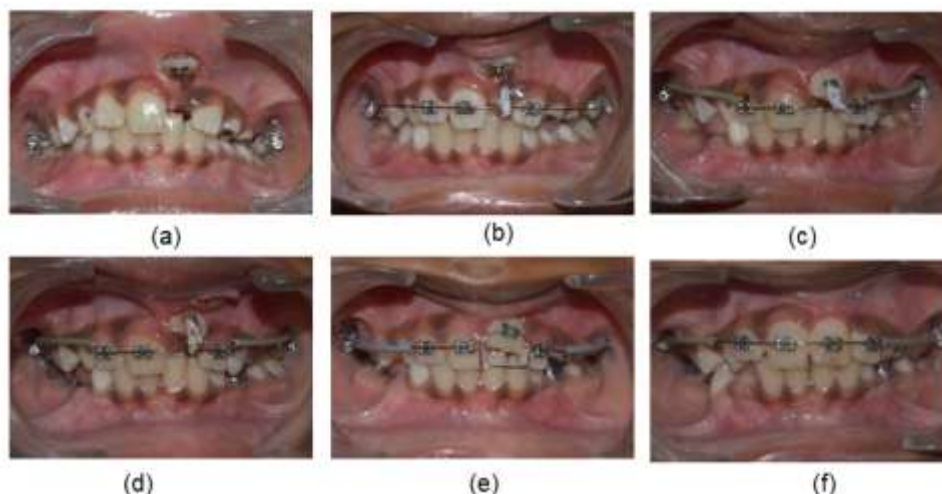


Fig-4: (a)- attachment bonded on exposed crown. (b)- Traction applied by e thread (c and d) traction continued (e) Piggy back wire for 21 (f) Alignment achieved



**Fig-5: Post treatment photographs**

## DISCUSSION

A successful management of impacted central incisor is often a difficult task which requires careful comprehensive interdisciplinary treatment planning based on scientific rationale. Several reports have indicated an impacted tooth can be brought into proper alignment in the dental arch [5-10].

A precise location of impacted tooth was of prime importance in this case for proper treatment planning and execution of the same. Conventional two-dimensional (2D) radiographs, including panoramic, occlusal, and periapical radiographs remain the most commonly used modality for the primary diagnosis and localization of unerupted teeth and treatment planning [11]. However, 2D radiographic images are very limited in demonstrating the exact location of these teeth, the impact on neighboring teeth and other adjacent structures, and the anatomy of roots, which is of absolute relevance in treatment planning [12]. Cone-beam computed tomography (CBCT) allows construction of images in different planes eliminating superimposition thereby producing the high-quality diagnostic 3D images with minimal distortion. With significant advances CBCT allows excellent images in relatively low cost, and significantly reduced radiation dose as compared to other CT modalities [13]. In cases of impacted teeth, images obtained by CBCT are accurate in determining their buccal-palatal location and angulation; in determining the proximity of impacted teeth to the roots of adjacent teeth, as well as the degree of resorption [14].

The age of the patient of 9 year played a paramount role as the orthodontic traction was devised to augment the natural eruption process by providing directional traction. Aligning the teeth and relocating the roots of the incisors in the alveolar bone. Alignment

is necessary for teeth that have been displaced buccally, palatally, mesially, or distally by space-occupying supernumerary teeth, odontomas, or soft-tissue lesions. Alignment and root relocation must be performed at this stage to prevent future periodontal defects such as dehiscences, which adversely affect the patient's prognosis [2].

## CONCLUSION

Disimpaction was successfully achieved. The alignment of incisor achieved by a minimally invasive technique was successful showed good stability.

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