

Complete Management of Maxillary Impacted and Dilacerated Central Incisor

RUBY SHAH



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A 10-year-old male child reported to a dental clinic with a chief complaint of missing upper anterior tooth since four years after the fall of the primary tooth [Table/Fig-1]. Parents gave history of trauma at the age around two years due to a fall from the table which resulted in intrusion of the primary left maxillary central incisor. At that time as per the parents, the dentist in local community advised them dietary instructions and medication for pain. The intruded primary tooth erupted spontaneously and exfoliated at normal time.



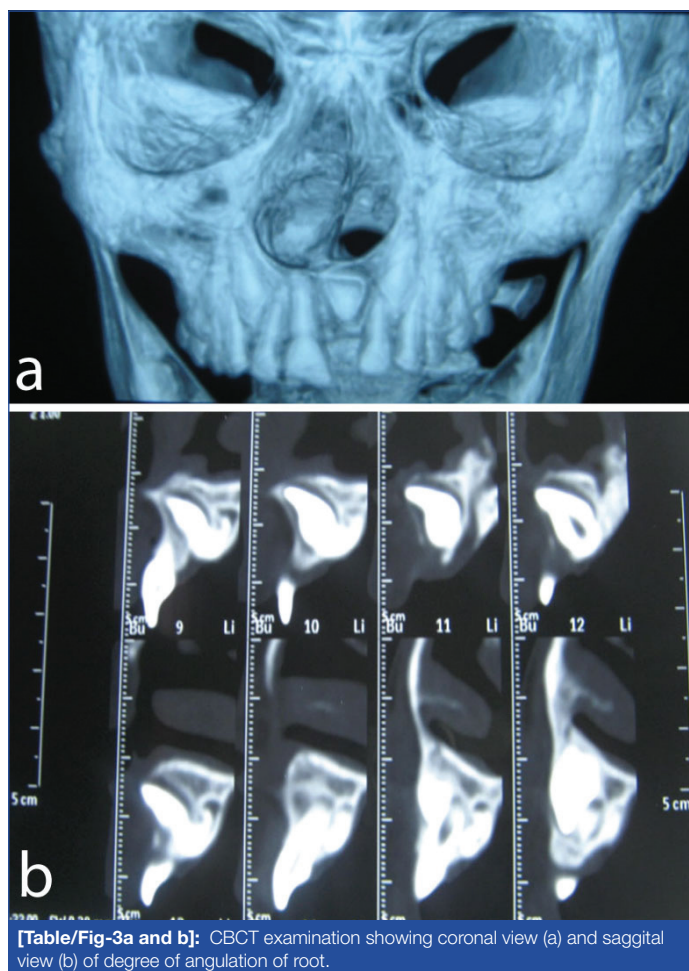
[Table/Fig-1]: Missing maxillary left upper anterior tooth.

The intraoral clinical examination revealed healthy mixed dentition with well formed labial mucosa and missing tooth number 21 with bulge on the palatal mucosa of 21 [Table/Fig-2]. Sagittal section of Cone Beam Computed Tomography (CBCT) revealed that the impacted tooth was located palatally close to palatal cortical bone, palatal angulation and dilacerated at cemento-enamel junction [Table/Fig-3a,b].



[Table/Fig-2]: Intraoral examination showing palatal bulge.

Various treatment options were considered like surgical removal of the dilacerated tooth and then restoring with a bridge or implant after orthodontic space opening when growth had stabilised. Extraction of the impacted tooth, orthodontic treatment for spacing correction and prosthodontic restoration of the left lateral incisor as the central incisor after growth ceases; orthodontic space opening, and orthodontic

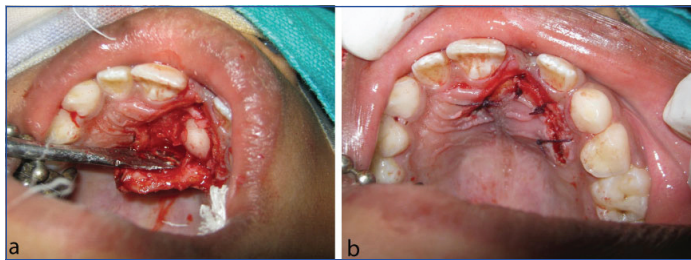


[Table/Fig-3a and b]: CBCT examination showing coronal view (a) and sagittal view (b) of degree of angulation of root.

traction of the impacted tooth into proper alignment. Orthodontic traction was not possible due to the severity of the impaction and angulation. The parents opted for restoring the space with implants at later stage but prefer to have a temporary management of space resulting after surgical removal and orthodontic intervention.

Surgical extraction under general anaesthesia was planned considering the age and cooperativeness of the patient. Informed consent was taken from the parents and preanaesthesia evaluation was done by an anaesthesiologist followed by routine blood investigation to assess for clotting and bleeding time. Under general anaesthesia, the location of impacted tooth 21 was isolated and palatal mucoperiosteal flap was raised. Palatal bone was removed adequately with slow speed hand piece with round bur (No. 8), irrigation was done with normal saline to expose the impacted dilacerated tooth. Due to the insufficient access for the removal of tooth and the angulation of dilacerated root, the tooth was not removed as a whole and needed to be sectioned and extracted. The margin of the bone was smoothed with a bone file. The palatal mucoperiosteal flap was repositioned and sutured with 3-0 black braided silk (Mersilk, Ethicon, Inc., Johnson and Johnson company, USA). [Table/Fig-4a,b]. Sutures were removed after one week and the healing was

uneventful. Amoxicillin Clavunate (25-45 mg/kg/day in divided doses every 12 hours) and Acetaminophen (10-15 mg/kg/dose every 4-6 hours) for five days was prescribed. The child and parents were advised for soft cold diet for 24 hours and avoid spitting and rinsing the mouth vigorously for 48 hours. Follow-up appointment was done again after two weeks and then after four weeks complete healing of the palatal mucosa was seen [Table/Fig-5].

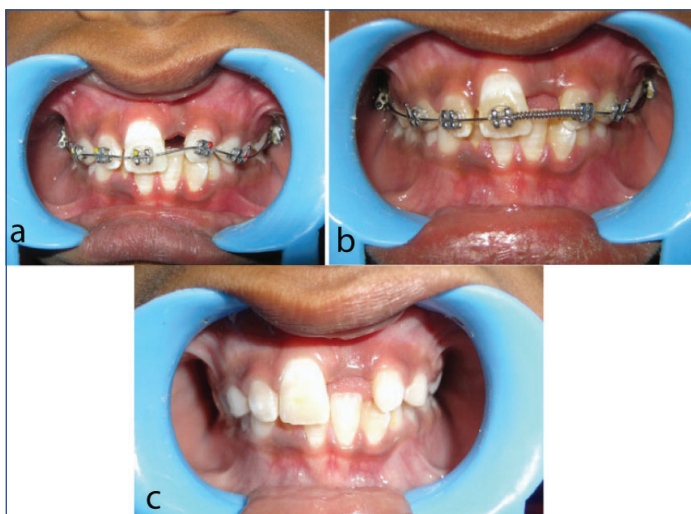


[Table/Fig-4]: Surgical extraction of impacted dilacerated tooth (a) and sutured with resorbable suture (b).



[Table/Fig-5]: Complete healing after four weeks.

In the next phase, fixed orthodontic treatment was started on maxillary arch to create adequate space for the prosthetic replacement of central incisor. Initial alignment and leveling was achieved with super elastic 0.016 inch Nickel-Titanium (NiTi) wire. Bands were placed on the upper first molars, and orthodontic brackets were limited to the three permanent anterior teeth and two primary canines. Compressed nickel-titanium open coil spring 2-3 mm longer than the space required between left maxillary lateral incisor and right maxillary central incisor was inserted in order to open the required space for the replacement of missing tooth and to maintain the space for the future bridge or implant placement once the growth ceases [Table/Fig-6a-c].



[Table/Fig-6a,b and c]: Space regained with NITI coil spring (a,b) and after eight weeks space regained for placement of denture tooth (c).

After eight weeks of regular follow-up and orthodontic adjustments, Ribbond bridge was planned as it is a minimally invasive and cost-effective procedure. A length of 3 mm-wide Ribbond (Ribbond,

USA) fiber strip was cut (predetermined by dental floss) using special scissors [Table/Fig-7]. The palatal surface of teeth 11 and 22 were prepared to receive the Ribbond (Ribbond, USA). As a pontic, pre-fabricated acrylic denture tooth was prepared by making undercut lingual groove and bonded in place with composite. Occlusion was adjusted and polished [Table/Fig-8]. The child and the parents were instructed to not to bite hard food and objects from the temporary tooth and the bridge will help in only in aesthetics and phonation. Regular follow-up for every six months was advised.



[Table/Fig-7]: Ribbond fibre strip placed on palatal surface of teeth 11 and 22.



[Table/Fig-8]: Denture tooth was placed to maintain the space for future prosthesis.

Trauma to the primary teeth can lead to devastating sequels in successor teeth. Regular follow-up was recommended so that effects on permanent teeth can be detected early and if possible can be rectified. Lenzi MM et al., has concluded that dilacerations of crown is most commonly due to intrusion of primary teeth in the apical direction or tooth avulsion [1]. In the present case, also parents gave the history of fall at early years which can be the reason of dilaceration of tooth.

The management of dilacerated teeth should start at an early age in accordance with their eruption time so that non calcified root can develop a proper spatial relationship with formed crown which is already calcified and can change its direction [2]. Failure of intervention may lead to delayed tooth eruption, midline shift, space closure due to adjacent teeth and alveolar crest height differences [3]. All the teeth that have not erupted six months after the normal eruption time are strongly recommended to be examined radiographically to determine any possible cause for the delayed eruption. Intervention should begin as early as possible, so that normal root development can continue [4]. In the present case also, the parents reported the child to the dental clinic at the age of 10 years, which resulted in space closure and thus orthodontic management was carried out.

In addition to routine clinical examination, radiographic examination is also essential for diagnosing such anomalies. CBCT is indispensable

in reaching out for definitive diagnosis and in modifying and improving the treatment planning. Treatment modalities for dilacerated tooth depend on the angulation of the crown and degree of impaction [5]. In the present study, the tooth angulation does not allow surgical repositioning and orthodontic traction due to the complexity of the position of tooth [6]. Fixed orthodontic brackets with NiTi open coil spring has advantage of shape memory and super elasticity with minimum load fluctuation. This property actually helps to induce large tooth movements without replacement of the spring [7].

Considering the patient's young age, conservative temporary bridge (denture tooth type) Ribbond was used so that arch space can be conserved and it will improve the prognosis for the fixed prosthesis/implant if planned in future. It is a bondable, polyethylene, lock-stitch multidirectional reinforcement ribbon for composite resin [8]. The Ribbond's fibre strip imparts a multidirectional reinforcement to restorative materials by its unique and patented fibre weave [9].

Early detection of dilacerated tooth should be stressed by regular dental follow-up so that surgical intervention can be skipped. With any treatment, priority should be given to the patient's concerns and expectations, at the same time ensuring the overall well-being of the child.

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PARTICULARS OF CONTRIBUTORS:

Paediatric Dentist, Private Practice, Mediclinic Airport Road Hospital, Abu Dhabi, United Arab Emirates.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Ruby Shah,
1503, Bin Salama Tower, Al Nasr Street Abu Dhabi, Abu Dhabi, United Arab Emirates.
E-mail: drrubyshah13@gmail.com

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