

## CASE REPORT

# Multidisciplinary Approach for the Management of Dilacerated Permanent Maxillary Incisor: A Case Report

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## ABSTRACT

Dilaceration is an abrupt deviation along the long axis of the tooth, which may be observed between the crown, root, or both. Management of such teeth poses a unique challenge to the clinician due to its position within the esthetic zone. This case report describes the management of impacted maxillary central incisor with severe root dilacerations (90° angulation and crown directed toward the anterior nasal spine). Surgical extraction of tooth was done after the elevation of the flap and fixed orthodontic treatment was planned to regain the required amount of space followed by prosthetic rehabilitation using the same extracted tooth as pontic.

**Keywords:** Biological restoration, Dilaceration, Fixed orthodontic treatment, Impacted, Multidisciplinary approach, Surgical removal.

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## BACKGROUND

Tooth dilaceration is a developmental disturbance that is associated with a change in orientation of the root often in the labiolingual or mesiodistal direction.<sup>1</sup> John Tomes in 1848 was the first person to report a central incisor with angulated root and coined it as "Dilaceration" (Latin: dilacero = tear up). He considered it as a forcible separation of developed dentin from the developing dentin.<sup>2</sup> Prevalence was reported to be 4.6%.<sup>3</sup> The etiological factors for the impacted incisors can be because of trauma, mechanical obstruction by supernumerary teeth, developmental disturbances.

The present case aims at integrated management of surgical-orthodontic-prosthetic rehabilitation of a horizontally impacted central incisor with severe root dilaceration (more than 90° angulation) and crown directed toward the anterior nasal spine (ANS).

## CASE DESCRIPTION

A 9-year-old female patient reported to the Department of Pediatric Dentistry with a complaint of missing upper front tooth. History revealed that the patient had an injury to the front tooth region 5 years ago, due to a fall. Intraoral examination revealed a missing left central incisor with mesial migration of the left lateral incisor resulting in space loss and rotation of the erupting premolars (Figs 1A to C). An intraoral periapical radiograph revealed an impacted malformed central incisor which necessitated further investigations (Fig. 2A). To assess the detailed three-dimensional positioning of the root in orthogonal and oblique planes, cone-beam computed tomography was advised, which revealed dilaceration of the root with more than 90° angulation and crown directed toward the ANS (Figs 2B and C).

Informed consent was taken from the parent. Local anesthesia was administered and a crevicular incision was made, followed by retraction of the full thickness mucoperiosteal flap. On the elevation of the flap, the crown portion of the tooth was visible, which was luxated with a periosteal elevator and carefully extracted (Figs 1D and E). The raised flap was repositioned and sutures (*Ethicon*) were

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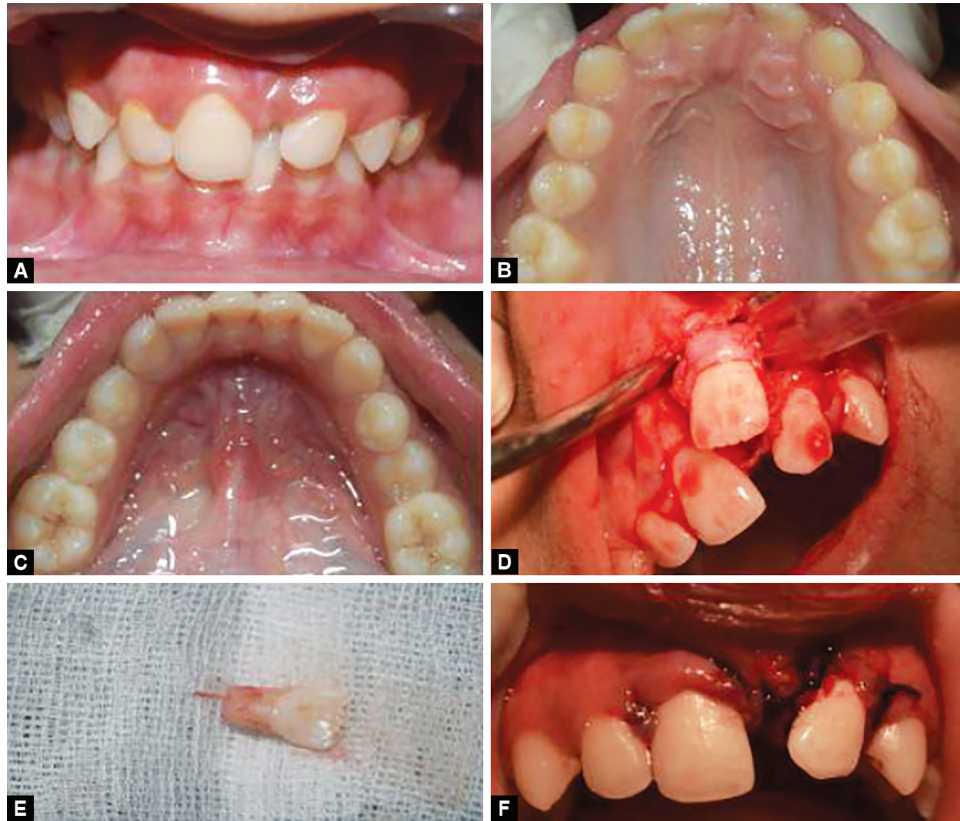
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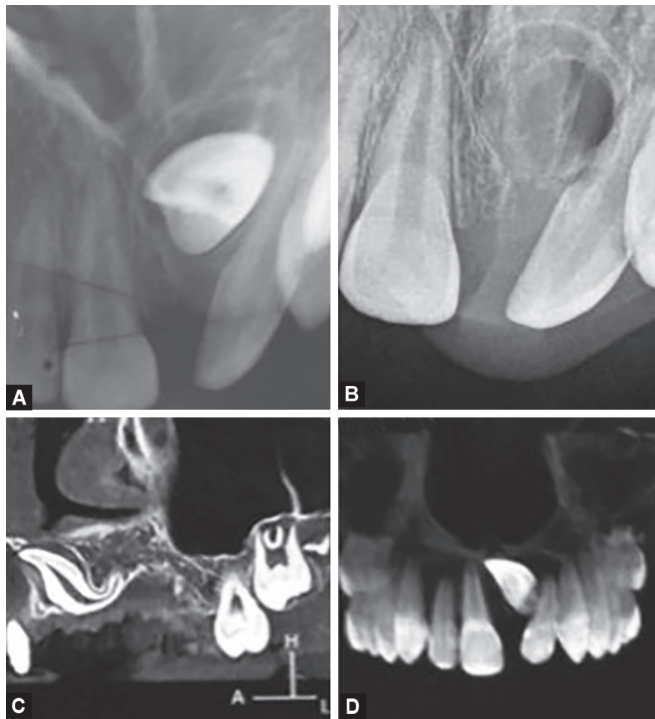
placed (Fig. 1F). Postoperative intraoral periapical radiograph (IOPA) was taken following extraction (Fig. 2D). The patient was recalled after 1 week and sutures were removed.

Fixed orthodontic treatment was planned to regain the required amount of space (Fig. 3A). The space required was calculated using adjacent teeth as a referral, which was about 8 mm (space loss 4 mm). Space regaining was planned using an open-coil spring, for which buccal tubes were placed on the first permanent molars, and McLaughlin Bennett and Trevisi (MBT) brackets were placed on the incisors. 0.14-inch Ni-Ti round initial alignment wire was placed, with an open-coil spring between right central and left lateral incisor (Fig. 3B). 0.16-inch Ni-Ti round wire was placed to correct derotation of the premolars using couple with the help of lingual buttons (Fig. 3C). Following derotation, stabilization was done using 0.19 × 0.25-inch stainless steel rectangular wire. Debonding of the brackets was done after 1 month of stabilization (Fig. 3D).

Prosthetic rehabilitation was done using extracted teeth as a pontic. The extracted tooth was decoronated at the cemento-enamel junction (CEJ) using diamond disk bur (Fig. 3E). The tooth was trimmed and adjusted according to the alveolar ridge and was bonded with the lingual retainer (canine to canine) (Fig. 3F).



**Figs 1A to F:** (A to C) Intraoral photographs; (D) Surgical extraction of impacted dilacerated central incisor, (E) Extracted tooth; (F) Sutures placed



**Figs 2A to D:** (A) IOPA of impacted central incisor; (B and C) CBCT showing impacted dilacerated central incisor; (D) Postoperative IOPA

## DISCUSSION

It is an arduous clinical task for the rehabilitation of dilacerated impacted central incisor. According to Lin, factors to be considered for successful treatment include.<sup>4</sup>

- Crown root alignment of the impacted tooth.
- Stage of root development.
- Deviated angle of dilaceration.
- Space present in arch for aligning the impacted tooth.

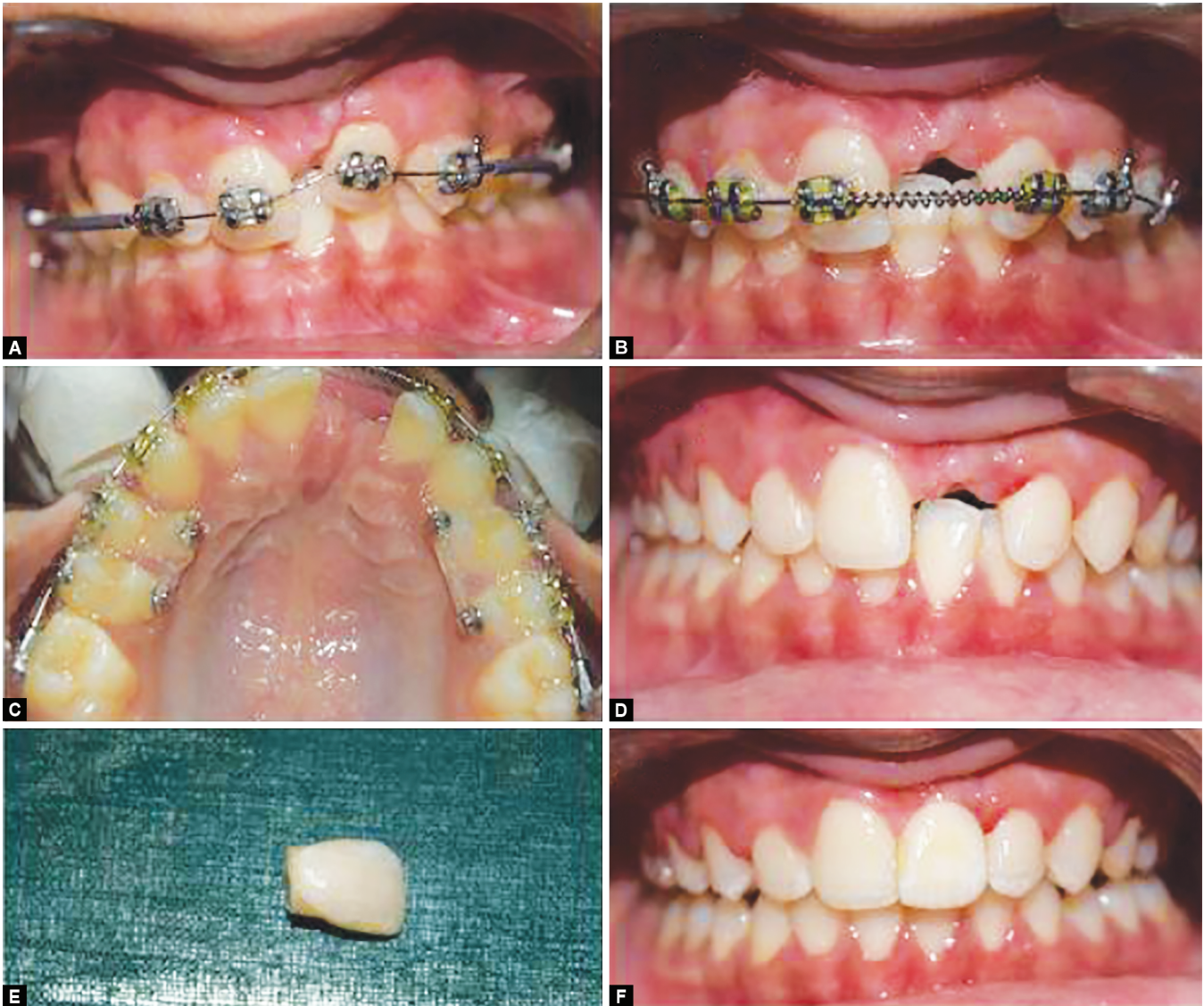
The most common presentation of a dilacerated incisor is with its crown lying horizontally and the root developing vertically so that when the tooth is properly positioned, the tooth root will be pointing labially.<sup>5</sup>

Most orthodontists believe that the primary etiological factor for dilacerated incisor is trauma. However, other factors do exist and the exact cause may not be fully understood.<sup>6</sup>

For a better prognosis of orthodontic traction, the position of the dilacerated root and its developmental stage plays a pivotal role.<sup>7</sup> In the present case report to appreciate these features, cone beam computed tomography (CBCT) was advised and on interpretation, it revealed that the dilaceration was more than 90° toward the crown, and the crown was directed toward the ANS. However, Uematsu et al. stated that orthodontic traction of severely dilacerated teeth may result in ankylosis, periodontal attachment loss, root resorption, and exposure.<sup>8</sup>

In the present case, the crown was positioned close to the ANS, the root was severely dilacerated with complete root formation;





**Figs 3A to F:** (A) Fixed orthodontic treatment; (B) Open-coil spring for regaining space; (C) Derotation using lingual buttons; (D) Brackets debonded; (E) Preparation of pontic (extracted tooth); (F) Replaced pontic using a lingual retainer

therefore, extraction was planned. Following extraction, fixed orthodontic treatment was commenced. A fixed appliance was preferred as it minimizes patient discomfort, reduces the need for patient compliance with increased control of tooth movements in all three directions of space.<sup>9</sup>

Open-coil spring facilitated to redistribute the space at the missing central incisor. Later, for derotations of premolars, MBT brackets and lingual buttons were bonded to establish a couple of forces. After settlement wire, brackets were debonded, and lingual retainer was planned for which extracted tooth was bonded as a pontic, considered as a “Biological restoration”. The term biological restoration was coined by Santos and Bianchi in 1991. Natural teeth as a pontic provides accurate morphology and hue similar to the adjacent teeth with psychological benefit to the patient. The duration of the treatment was about 8 months, the patient was recalled at 1, 3, and 6 months of interval. However, this approach essentiate the reevaluation until the patient attains complete growth.<sup>10</sup>

## CONCLUSION

In this case, surgical, orthodontic, and prosthodontic treatments were sequentially planned for optimal treatment outcome with esthetic and functional well-being. The further comprehensive treatment has to be planned after the cessation of the dental and skeletal growth of the individual.

## CLINICAL SIGNIFICANCE

Accurate assessment of the early symptoms of an affected tooth is crucial for proper diagnosis and for establishing a comprehensive treatment plan which minimizes future adverse effects.

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