

# ORTHODONTIC MANAGEMENT OF A MISSING MAXILLARY CENTRAL INCISOR WITH DILACERATED ROOT: A CASE REPORT

## A Case Report

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### ABSTRACT

Dilaceration is a dental deformity characterized by an angulation between crown and root causing non-eruption of the tooth. It generally occurs following trauma to the deciduous dentition the apices of which lie close to the permanent tooth buds. Surgical extraction used to be the first choice in treating the severely dilacerated teeth. In this case report, it is described how a dilacerated central incisor was successfully moved into alignment in a young patient with proper surgical and orthodontic management avoiding use of prosthetic/implant devices. The panoramic radiograph after the traumatic injury is compared with the one at the end of treatment.

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### INTRODUCTION:

Determining prognosis and designing a treatment plan for a dilacerated impacted tooth are often difficult tasks.

Dilaceration is defined as a distorted root form and it can occur from any distortion of the crown relative to the root<sup>1,2</sup>. This sort of lesion in a permanent tooth is caused by some trauma to the corresponding deciduous tooth (usually upper and lower incisors)<sup>3,5</sup>.

The severity of the lesion on a permanent tooth depends on the developmental stage of the tooth, the force of impaction and the direction the force of the trauma was applied with respect to the permanent tooth<sup>6,7</sup>. The trauma usually responsible for this type of lesion is frequent traumatic intrusion or avulsion during childhood. If the trauma occurs while the crown of the permanent tooth is forming, enamel formation will be disturbed and there will be a defect in the crown of the permanent tooth<sup>1</sup>. If the trauma occurs after the crown is complete, the crown may be displaced relative to the root. Root formation may stop, leaving a permanently shortened root. More frequently, however, root formation continues, but the remaining portion of the root then forms at an angle to the traumatically displaced crown. If distortion of root position is severe enough, it is almost impossible for the crown to assume its proper position<sup>1,8</sup>. The crown is usually dislocated forward with the palatal surface facing the vestibular site, the incisor border is turned up towards the anterior nasal bone; the root remains in its normal position.

It is often possible to save dilacerated impacted teeth with a multidisciplinary approach. The factor determining prognosis is whether the tooth is already ankylosed or if excessive or intermittent orthodontic forces lead to external resorption of the roots<sup>9,10</sup>. In this case report, it is described how a dilacerated upper central incisor was moved into its proper position with surgical exposure and orthodontic traction avoiding prosthetic/implants replacement.

### CASE REPORT:

A patient named Govind Thakur, aged 17, (fig 1, fig 2) came to the department of orthodontics at Ahmedabad Dental College with chief complaint of missing central incisor due to trauma during childhood. The OPG and CBCT scans showed dilaceration of the root.



Pre - Treatment Photo (Fig-1)



Fig-2

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## TREATMENT OBJECTIVES AND TREATMENT PLANNING:

Treatment alternatives for an impacted central incisor include extraction and restoration with a bridge or an implant later when growth has ceased; extraction and closure of the space by substituting the lateral incisor for the central incisor with subsequent prosthetic restoration; and surgical exposure, orthodontic space opening, and traction of the impacted central incisor into its proper position.<sup>10,11</sup> Clinicians should consider treatment goals that minimize injuries to the dentition and the periodontium.<sup>12</sup>

The following treatment objectives were established:

- (1) create a stable functional occlusion
- (2) establish adequate attached gingiva and symmetric gingival margins for both maxillary central incisors.

## TREATMENT ALTERNATIVES:

1. Extraction of the impacted central incisor and future restoration with a bridge or an implant when growth had ceased.
2. Extraction of the impacted central incisor and closure of the space, bringing the lateral incisor into the place of the central incisor, and subsequent prosthetic restoration.
3. Surgical exposure, and traction of the impacted dilacerated central incisor into its proper position.

The patient chose the 3rd alternative as he was young and wanted a natural option.

## TREATMENT PROGRESS:

After surgical exposure of the crown MBT PEA bracket was bonded on the visible palatal surface of the maxillary right central incisor (fig 3). Upper arch was bonded and 0.018 SS wire was used as the main arch wire force in the form of elastic traction was given in the form of a bracket of main arch wire. The right and left arches segments of the arch were consolidated. At each subsequent appointment direction of force was changed as it eased the extrusion of a tooth with dilacerated root this was done with help of lingual buttons placed mesially and distally on the palatal surface and continued elastic traction (fig 4). Once the tooth was

sufficiently visible in the oral cavity the piggy-back method was used for further extrusion by bonding two beg brackets on the buccal surface of the central incisor.



Surgically Exposed incisor



Braacet bonded & elastic traction given

## TREATMENT RESULTS:

Within 2 months of surgical exposure the central incisor for sufficiently extruded to place a bracket on the buccal surface. (periodontal procedure if required)

## DISCUSSION:

An impacted maxillary central incisor in a child poses a disturbing esthetic dilemma because of its prominent location. However, it is important to properly inform the patient and the parents of the possibility of failure before extensive measures are undertaken to save a severely impacted tooth.<sup>14</sup>

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.<sup>11</sup> 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 sufficient space for the maxillary right central incisor to be moved into the arch.

Movement of an impacted central incisor could be impossible because of ankylosis and external root resorption.<sup>13,15</sup> Furthermore, even successfully treated patients can have irregular root formation or an unesthetic gingival margin after alignment.<sup>16</sup> However, these complications did not occur in this patient.

Although the closed-eruption technique usually provides the most esthetically pleasing result, we

did not use this surgical technique<sup>17,18</sup>. The position of the impacted maxillary central incisor meant that direct removal of the oral mucosa was the only way to expose the tooth and attach the wire. This procedure, although more direct, has the disadvantage of producing a nonkeratinized vestibular gingival margin.<sup>16</sup> This was corrected with an apically positioned flap during the traction to provide adequate width of the attached gingiva and result in a more esthetic gingival margin. Because of the relatively high prevalence of gingival defects in some studies, adjunctive post-orthodontic periodontal surgery might be required in many patients treated with this method to achieve

an esthetic gingival margin contour over the central incisors and provide the teeth with an adequate zone of attached gingiva.<sup>16</sup>

### CONCLUSION:

Use of light and constant orthodontic forces (30–40 g); and the favourable crown–root angle allowed the crown to be aligned without excessive dislocation of the root.

This final aspect can only be evaluated with precision during treatment. This orthodontic-surgical option is a possible technique guaranteeing sustainable results after attaining functional esthetic goals.

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