World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

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Understanding The Consequences of Primary Tooth Trauma: A case Report on Impacted and Dilacerated Central Maxillary Incisor

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World Journal of Advanced Research and Reviews, 2025, 26(02), 3584–3588

Publication history: Received on 15 April 2025; revised on 14 May 2025; accepted on 17 May 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.26.2.1609

Abstract

Introduction: Dental trauma in primary teeth can significantly affect the development and eruption of permanent successors, often leading to complications such as dilaceration. Dilaceration is a dental anomaly characterized by an abnormal angulation between the crown and root, which can result in impaction, aesthetic concerns, and functional difficulties.

Case History: This case report discusses the management of a severely impacted and dilacerated maxillary central incisor (#21) in a 9-year-old female patient. The patient presented with a partially erupted tooth causing discomfort, asymmetry, and functional difficulties. A history of trauma to the primary tooth (#61) at ages 3 and 4 was noted. Radiographic evaluation, including CBCT imaging, revealed an 80-degree crown-to-root angulation and horizontal impaction.

Discussion: Considering the severity of the displacement and the limited feasibility of conservative approaches like orthodontic traction, surgical extraction was performed. This decision aimed to alleviate symptoms and prevent further complications such as infection, damage to adjacent teeth, or aesthetic concerns. The case highlights the challenges posed by dilacerated teeth and underscores the importance of early diagnosis and tailored treatment planning.

Conclusion: This case emphasizes the importance of early recognition and intervention for dilacerated teeth. Surgical extraction proved to be an effective solution for managing this severe anomaly, addressing functional, aesthetic, and psychological concerns effectively.

Keywords: Dilaceration; Impacted tooth; Maxillary central incisor; Trauma; Surgical extraction; Human and health

1. Introduction

In young permanent tooth, dilaceration is developmental disorder that manifests as an irregular angulation of sharp bend in the tooth's root or crown. [1] It frequently happens when primary tooth sustains trauma that affects in permanent tooth germ underneath as it is developing.[2]

Several research have indicated that dental trauma is less prevalent in Indonesia; nonetheless, the World Health Organization (WHO) discovered that dental trauma rates vary by country. About 11.4% of Indonesians have suffered from dental trauma. Brazil has a higher frequency than Indonesia, according to research, at 16.5%. In comparison to Indonesia, a study conducted in New Delhi, India, indicated that the prevalence of dental trauma in children aged 1 to 14 years was 1.25 percent. [3, 4]

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Injuries to the teeth, periodontium, and surrounding soft tissues are referred to as dental trauma in children. These injuries are rather prevalent, making up up to 17% of all body injuries in preschoolers and 5% of all traumatic injuries in people seeking first assistance. Many factors, including falls, sports-related injuries, accidents, and violence, can result in dental trauma. It is more common in primary dentition but can affect both permanent and primary dentitions. Dental trauma can result in pulpal necrosis, hard tissue resorption, pulp obliteration, and even the loss of the tooth or teeth that are afflicted.[5]

When trauma affects deciduous teeth, it can have a major impact on the tooth and its permanent replacement. Even with small injuries, deciduous teeth might undergo colour changes in the initial weeks following the damage. This is a well-known, commonly occurring colour change. In deciduous teeth, especially in the maxillary central incisors, enamel fractures are a frequent kind of trauma. Trauma can result in hypoplasia and discoloration of the enamel, which can cause additional developmental abnormalities and white or yellow-brown discolouration and circular hypoplasia of the enamel. Trauma may result in root resorption, which may alter the tooth's structure and form, as well as impact on permanent teeth.[6]

This paper aims to management of an impacted and dilacerated young permanent central maxillary incisor, also using digital technology to determine whether the tooth can be preserved based on the clinical findings for each patient.

2. Case History

A 9-year-old female patient, accompanied by her parents, was referred by the dentist in Bhakti Darma Husada hospital in Surabaya and came to the RSKGMP Universitas Airlangga with the chief complaint of a partially erupted left upper incisor (#21) that had been irritating the labial vestibule causing her upper left lip asymmetric, difficulty in eating and speaking, and was also painful when palpated. The partially erupted tooth had already emerged for three months. There were histories of traumas to tooth #61 that happened twice when the patient was 3 years and 4 years of age. The trauma resulted from a collision with hard surfaces that directly hit the anterior primary tooth. Extraoral examination showed symmetrical face with no lymphadenopathy. On intraoral examination, was found crown of a tooth in the mandibular incisor region with white color, small size, and severe mobility based on Miller's classification (Grade 2) (Figure 1a). Soft tissue was normal and no ulceration on the ventral surface of the tongue.

Figure 1 Extraoral view (left). Intraoral showing impacted tooth #21(a); and intraoral showing tooth #21 after surgical(b)

Panoramic examination revealed #21 tooth impaction. Teeth 53, 63, 73, 74, 75, 83, 84, 85 had existed (figure 2). CBCT (Cone-Beam Computed Tomography) found #21 tooth impaction were labially impacted and horizontally displaced position. The crown axis inverted about 80 degree from normal, and the CRR (crown-to-root) ratio was 2:1.

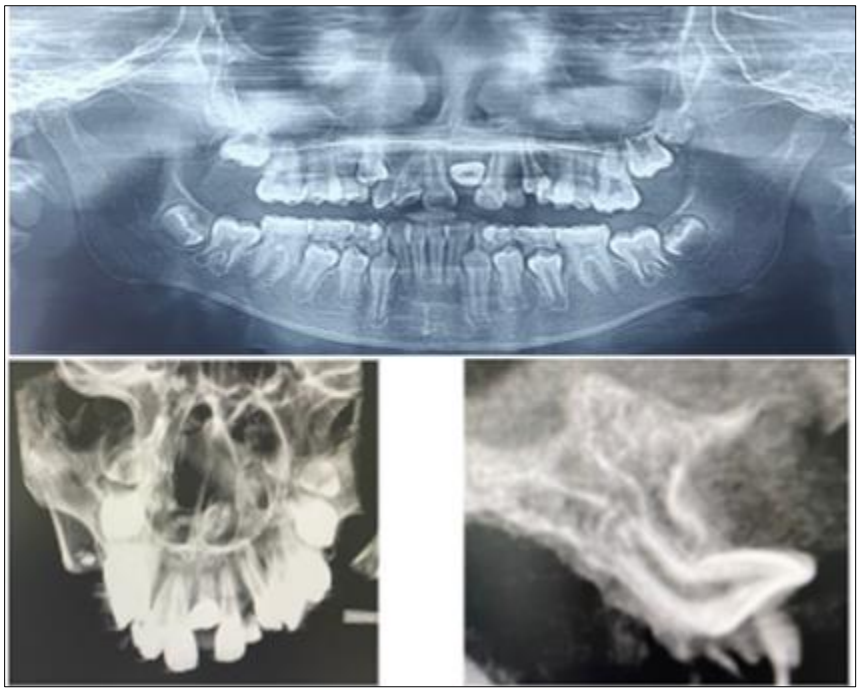

Figure 2 Radiographs panoramic at initial (a). Radiographs CBCT view showing impacted tooth #21(b)

After a discussion about the advantages and disadvantages of each treatment plan, it was decided to remove #21 tooth by surgical approach. Initial treatment was scaling root planing, followed by surgical exposure to relieve the pain. The patient was then instructed to maintain oral hygiene and to come in a week after for surgical removal of the tooth (figure 3). The parents and the patient were informed consent before the surgical treatment and advised to take painkiller and to have soft diet for a week after surgery.

Figure 3 Extracted tooth showing #21 dilaceration tooth(a). Post-op after extraction tooth #21(b). One week after extraction tooth #21(c)

3. Discussion

A developmental abnormality known as tooth dilaceration is defined by an irregular curvature or angulation of the tooth's crown or root. The most frequent cause of this problem is trauma to the primary teeth, which interferes with the proper development of the permanent successors. Additional factors that contribute to aberrant root curvature include the existence of cysts, tumors, or ankylosed deciduous teeth that hinder the development of permanent teeth.

The diagnosis and treatment planning process heavily relies on radiographic imaging. Cone-beam computed tomography (CBCT) is an example of advanced imaging that may help determine the exact location and orientation of the damaged tooth, improving diagnosis and therapy.

Dilaceration can have a major effect on oral health and the results of therapy. Frequently, it results in aesthetic problems: Because of the trauma that affects their development, teeth may appear discolored (brown or yellow) and have hypoplastic enamel. The second is functional challenges: the angulation can make orthodontic treatments and other dental procedures more difficult since displaced teeth are more difficult to move and may take longer to repair. and third, elevated caries risk: Carious lesions are more likely to develop in areas where dilaceration occurs because biofilm can build up there more easily.

The following treatment alternatives were discussed: autotransplantation, surgical extraction of the affected tooth with a fixed prosthetic, and surgical exposure followed by orthodontic traction. Due to the significant displacement of the impacted incisor's root, extraction and subsequent replantation would likely be challenging, and ankylosis would likely be a possibility. The tooth root becomes significantly angular as a result of dilatation, which may prevent appropriate eruption. Orthodontic techniques like traction become unfeasible or ineffectual when the angle of dilatation is severe (often 90 degrees or more), making extraction a more practical option.[7]

We extracted the tooth #21 in this instance because we discovered that the root was significantly displaced, making conservative measures like orthodontics potentially ineffective. During traction, displaced roots are more likely to break. If the tooth is left unerupted, it can cause discomfort, infection, and other complications in addition to functional and aesthetic issues.

4. Conclusion

Considering the degree and direction of the tooth, location, the maturity of apex, and space available for the tooth in the arch, also patient's concerns and expectation, the most favorable treatment plan for dilacerated tooth is surgical removal of the tooth.

Compliance with ethical standards

Acknowledgments

The authors thank the reviewers for their insightful suggestions.

Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this document.

Statement of informed consent

Informed consent was obtained from patient included in the study.

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