

Intra-alveolar fracture of a developing permanent incisor

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Abstract

A longitudinal complicated crown-root fracture of an unerupted permanent incisor following trauma to primary teeth is reported. The development of the affected permanent tooth was not disturbed during a follow-up period of six years.

Traumatic injuries to primary teeth can be transmitted to the permanent dentition because of the close relationship between the apices of primary teeth and the developing permanent successors. Intra-alveolar crown fracture of developing permanent dentition following trauma to primary teeth is considered rare.¹ The common findings due to such injuries are discoloration of enamel, enamel hypoplasia, crown dilaceration, abnormal root angulation, or disturbances in eruption (Andreassen 1981). The present report describes a longitudinal crown-root fracture of an unerupted incisor following traumatic injury to the primary dentition and its long-term follow-up.

Case Report

A six-year-old boy was seen at the Department of Oral and Maxillofacial Surgery, Hadassah School of Dental Medicine, Jerusalem, following trauma to his face. Oral examination revealed hematoma to upper lip and gingiva and luxation of maxillary left primary central and lateral incisors (Fig 1). Periapical radiographs disclosed that the roots of the maxillary central and lateral primary incisors had been almost completely resorbed, along with a longitudinal radiolucent line in the crown of the unerupted left maxillary central permanent incisor. Repeated radiographs confirmed the diagnosis of a longitudinal crown-root fracture (Fig 2). The left maxillary central and lateral primary incisors were removed under local anesthesia because of increased mobility and to reduce the infection hazard to the affected permanent tooth. Antibiotic treatment with

¹ Ripp 1971; Clausen and Lichtenberg Crone 1973; Joho and Marechaux 1980; Wilson 1981.

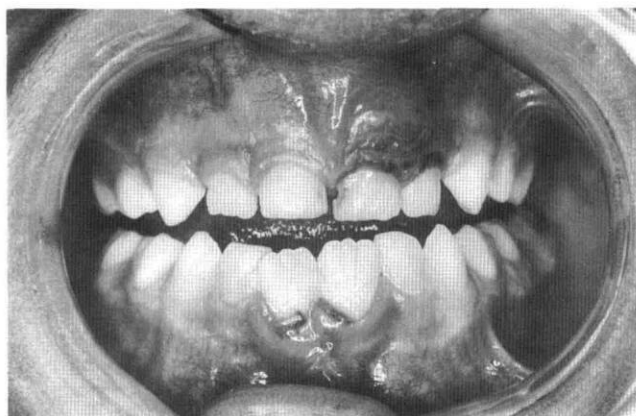


FIG 1. Hematoma of gingiva above central and lateral primary incisors following trauma.

penicillin was given for six days. Six weeks later the incisal edge of the maxillary left permanent central incisor emerged into the oral cavity and it was possible to visualize the labial-palatal crown fracture (Figs 3, 4 — next page). This fracture could be demonstrated by applying pressure with an explorer on the fracture line, resulting in minute separation of the two parts of the crown.

The patient was followed periodically up to six years. During this period of follow-up, the root development appeared to be normal and vitality tests performed by means of



FIG 2. Longitudinal radiolucent line in the crown of the maxillary left permanent central incisor apical to its primary resorbed predecessor.

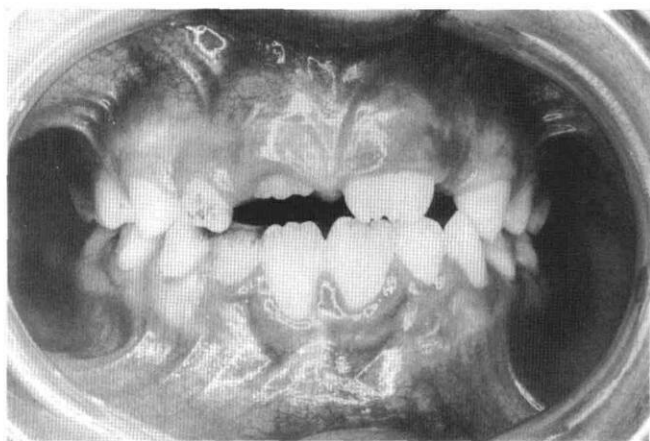


FIG 3. The affected incisor emerging into the oral cavity six weeks post-trauma. The fracture line is demonstrated on the buccal aspect of the crown.

an electric pulp tester were within normal limits. Four years post-trauma a composite restoration was placed to seal the fracture line. Six years post-trauma the affected tooth was asymptomatic, fully erupted, and functional. The only change as compared to the unaffected maxillary right permanent central incisor, was narrowing of the pulp chamber (Figs 5, 6). When the obliteration of the coronal pulp chamber first was noticed, an endodontic consultation was made. There was no endodontic intervention in view of the continuous development of the root, the positive vitality tests, and lack of clinical symptoms.

Discussion

Most of the injuries to developing permanent teeth following trauma to the primary dentition occur in children between two and four years of age, a period when the permanent dentition is in an early stage of development (Andreasen 1981). Injuries to permanent teeth following trauma to the primary dentition at the age of six years is much less common, mainly due to the advanced stage of the primary root resorption.

The exact mechanism of intra-alveolar crown frac-



FIG 4. The affected incisor, six weeks post-trauma.

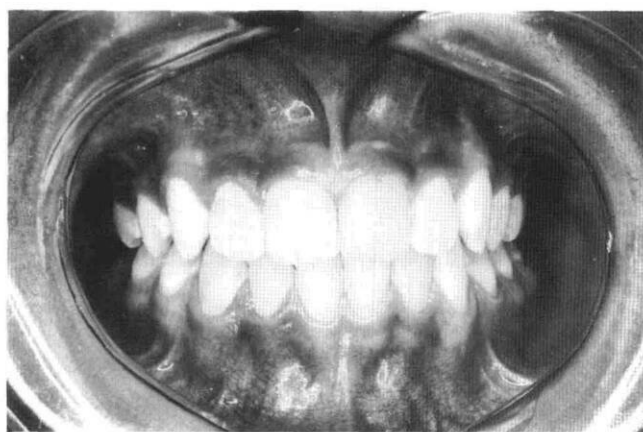


FIG 5. The affected incisor, six years post-trauma, in normal position, following composite filling of the fracture line.

ture is unclear. However, in the present case, it can be assumed that the sharp edge of a partially resorbed root acted as a wedge and transmitted splitting forces toward the permanent crown. Similar mechanism may explain several cases reported² in which an incisal edge had been fractured and eventually exfoliated.

The repair capacity of intra-alveolar crown fracture is unique. In the case described by Joho and Marechaux (1980) a horizontal complicated crown fracture had been self-repaired by dentin bridge, the tooth erupted, developed, and remained vital. In this case, with a longitudinal crown-root fracture the pulp may have been damaged, but it was apparently reversible.

The good blood supply to the pulp through the wide open apex and the protecting intra-alveolar environment in the early stages may be among the reasons for the recovery of the traumatized pulp, leading to continuous normal development of the tooth.

Conclusion

In order to take advantage of the unusual repair capacity of a partially erupted tooth with an intra-alveolar crown-root fracture, it would be advisable to control the infection by antibiotic therapy and remove the traumatized primary teeth which may be the portal



FIG 6. The affected incisor, six years post-trauma, demonstrating normal root development and obliteration of the coronal pulp chamber.

² Ripp 1971; Clausen and Lichtenberg Crone 1973; Wilson 1981.

of bacterial entry to the affected permanent tooth. Long-term follow-up will enable treatment as needed.

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Journal reorganization announced

The General Assembly of the American Academy of Pediatric Dentistry passed a proposal for reorganization of the editorial structure of *Pediatric Dentistry* at the 41st Annual Session in San Diego, California. This proposal, generated by Editor in Chief Ralph E. McDonald, Associate Editors, and a representative of the Academy's Professional Information Committee, was presented to the Board of Trustees by Dr. McDonald.

Highlights of the new organization are as follows:

Editorial Staff:

All editorial staff will remain the same. Dr. McDonald will remain editor in chief until the 1991 Annual Session. New candidates for editor in chief will be proposed to the Board of Trustees by a five-person search committee. The approved candidate will have a three-year initial term with one-year renewable terms thereafter to a total of no more than seven years.

Editorial Board:

A 12-person Editorial Board has been named (their names appear on the back cover). Each is appointed to a four-year term, with four going off the Board and four joining the Board each year. Candidates for the Board are proposed by the editor in chief and approved by the Board of Trustees. All submitted manuscripts will be reviewed by two members of the Editorial Board (a manuscript may be reviewed by other reviewers as well), and their recommendations are forwarded to the editor in chief who makes the final decision as to publication, revision, or rejection. The Editorial Board, in concert with the editor in chief, makes decisions related to the content of *Pediatric Dentistry* including stylistic considerations.

Abstract Editors:

At least eight abstract editors will be appointed to two-year terms, half retiring each year, with others appointed to new terms. Candidates for abstract editors are proposed by the editor in chief and Editorial Board and are approved by the Board of Trustees. Twelve abstract editors were named in San Diego (their names appear in the Abstract Section). These editors are responsible for abstracting articles of interest to *Pediatric Dentistry* readers. These articles appear in a wide variety of scientific journals and other sources which may not be readily accessible to some readers.

Historians:

Four historians also were named in San Diego: Drs. William E. Brown, Jr.; Cosmo R. Castaldi; Donald D. Porter; and Theodore C. Levitas. They will contribute articles of historical interest to readers on a wide range of topics including prominent individuals in the specialty of pediatric dentistry, changing technology, and the changing nature of the practice of pediatric dentistry. Dr. Ralph Ireland was named Historian Emeritus and will continue his series, *Pioneers in Pediatric Dentistry*.

These changes in organization are only the most visible recent efforts to make *Pediatric Dentistry* a valuable resource to our members, other pediatric dentists, dentistry at large, and the global health care community. We encourage, as always, your comments on the *Journal* and our efforts to serve you.

Ralph E. McDonald
Editor in Chief