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Surgical extrusion of a partially erupted and crown dilacerated incisor

CASE REPORT

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Abstract – A case report of treatment for an incompletely erupted maxillary central incisor with crown dilaceration in a 12-year-old boy is described. The tooth was repositioned with surgical extrusion and endodontically treated through use of calcium hydroxide paste. Clinical and radiographic examination 2 years after completion of combined surgical and endodontic treatment revealed periapical healing and no signs of root resorption.

Traumatic injuries to primary teeth may lead to damage of their permanent successors. Crown dilaceration is the displacement of a portion of the developing crown of a tooth at an angle to the longitudinal axis of the tooth. It constitutes 3% of injuries to developing teeth, and is the result of intrusion or avulsion of their primary predecessors, usually involving the maxillary and mandibular central incisors. Fifty percent of teeth with crown dilaceration become impacted, whereas the remaining erupt normally or in facio or linguo version. Radiographically, unerupted crown-dilacerated teeth are seen as foreshortened coronally (1–6). Depending on the severity and the level of the dilacerated area of the crown, various treatment models for such teeth have been described. Suggested techniques include conservative and prosthetic restoration of the crown, surgical removal of the dilacerated part of the crown, surgical exposure and orthodontic realignment or even extraction (6–8).

The purpose of this case report was to demonstrate the management of a crown dilacerated maxillary central incisor by using a surgical extrusion and stabilization technique.

Case report

The patient, a 12-year-old boy, was brought to our attention by his parents because of partial eruption of one of his maxillary anterior teeth. According to the history related by his mother, the child's primary maxillary central incisors sustained partial intrusion with displacement following a fall at the age of 1 year. The mother stated that the child's primary incisors had reerupted within approximately 4 months. When the child was 8 years old, the mother noticed that, although the maxillary permanent right central incisor had partially erupted, the adjacent central tooth had failed to erupt, upon which she took the child to a dentist. On radiographic examination the mother was told that the child had a permanent tooth in place and that all they had to do was to wait. Two years later, the mother noticed that a tooth had started to erupt in the region, but it did not erupt completely during the following 2 years.

On clinical examination, an incompletely erupted tooth was observed in the dental arch in the region of the maxillary left central incisor. The tooth did not respond to electric pulp testing, whereas the adjacent incisors responded to the test within normal limits. There was intraoral swelling on the alveolar mucosa and periodontal probing revealed periodontal attachment of the involved tooth (Fig. 1). Radiographic examination showed crown dilaceration of the maxillary left central incisor (Fig. 2). Both central incisors with fully formed root apices had no periapical pathologic changes visible radiographically.

After local anesthesia, luxation and extrusion were performed with elevators and forceps until the left central incisor was at the same incisal level as the right incisor (Fig. 3).

Immobilization of the tooth in this new position was achieved with interdental sutures and surgical dressing. Antibiotics were prescribed for 10 days, and the patient was encouraged to maintain good oral hygiene. The sutures were removed after a week, and surgical dressing was changed. Horizontal enamel hypoplasia with white discoloration was observed in the middle third of the dilacerated crown following surgical extrusion (Fig. 4).

Fig. 1. Clinical appearance of a partially erupted maxillary left central incisor. Note intraoral swelling on the alveolar mucosa above the involved tooth.

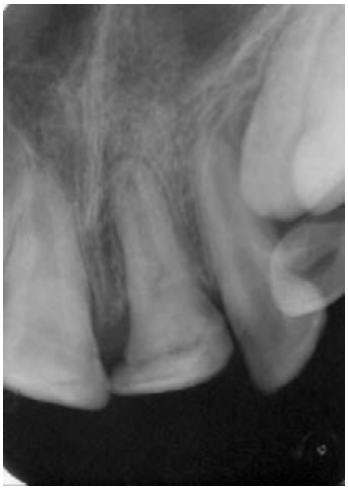

Fig. 2. Preoperative radiograph of the same tooth showing severe crown dilaceration.

Fig. 3. Position of the tooth immediately after surgical extrusion.

Fig. 4. Photograph showing appearance of the tooth crown immediately before root canal therapy. Note horizontal enamel hypoplasia with white discoloration in the middle third of the dilacerated crown.

Fig. 5. Radiograph taken at 3 months immediately after removal of calcium hydroxide dressing showing the resolution of the periapical radiolucency.

After 14 days the mobility of the tooth had decreased significantly so as to allow endodontic treatment. After achieving the facial-incisal access opening to a straight-line access to the root canal, it was instrumented and copiously irrigated with 5.25% of sodium hypochlorite. Calcium hydroxide paste was applied to the root canal. At the 3-month recall a periapical radiograph taken immediately after removal of calcium hydroxide showed bone regeneration at the apex of the involved tooth (Fig. 5). After obturating, the access opening was sealed with composite resin.

Two year recall clinical and radiographic examination revealed that the tooth was asymptomatic, that the periodontal tissues were healthy, that periapical radiolucency had resolved, and that there were no signs of root resorption (Fig. 6).

Discussion

Intrusive luxation of primary teeth is the most frequent cause of sequelae involving teeth of the permanent

Fig. 6. Two-year follow-up radiograph showing periapical healing and no signs of root resorption.

dentition with damage ranging from coronal changes in color and shape to crown and radicular malformation (1, 3, 6, 9). Andreasen et al. reported that 50% of teeth with crown dilacerations become impacted whereas the remaining ones erupt normally or in facio or linguo version. They suggested that in case the tooth has erupted to such a level that the dilacerated area is free of the gingiva, restorative therapy should be instituted as the central lumen of the ''internal root'' constitutes a pathway for bacteria into the pulp. Thus, a number of crown dilacerated teeth have been found to develop pulp necrosis and periapical inflammation after eruption without any evident decay (1).

In this case, the maxillary left central incisor was affected severely following intrusive luxation of the primary incisors at the age of 1 year. It had not erupted fully into position and the diagnosis was thought to be pulp necrosis due to the periodontal disease as suggested in the literature (1, 2).

Several modes of treatment for crown dilacerated teeth have been suggested (6–8). The present case demonstrated a rapid surgical extrusion of the tooth to facilitate early endodontic treatment.

Surgical extrusion of a tooth refers to a procedure in which an involved tooth is surgically extruded to its correct position and a new socket is created in the same alveolar bone. It maintains an intact dental arch and improves the esthetic and masticatory efficiency of the dentition. Additionally surgical extrusion is a one-step procedure that is simpler and less time-consuming than orthodontic appliances (10, 11).

Clinical studies demonstrated that this treatment mode was successful in the management of crown root fractured teeth (10–12), unerupted teeth (13), and intruded teeth (14, 15). Long-term prognosis of teeth treated with surgical extrusion and root canal treatment using calcium hydroxide showed either no or slight root resorption (surface resorption) (10, 11). In the present case, clinical and radiographic examination 2 years after surgical extrusion and root canal treatment using calcium hydroxide revealed apical healing and healthy supporting tissues with no root resorption.

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