



Unusual case of rootless premolar

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Tooth eruption with little or no root development is rare and is usually associated with neonatal teeth or defects in root formation due to irradiation therapy of the head and neck.¹ Possible causes of root absence are hereditary anomalies such as dentinal dysplasia, morphological anomalies known as dystrophies, and idiopathic root resorption.²

A tooth in a very early stage of root development can erupt prematurely when a periapical infection of the overlying primary tooth causes extensive bone destruction.³ Failure of the tooth germ to develop as a sequelae to periapical or inter-radicular infection of the primary tooth is uncommon but has been reported.⁴

We present a case of premolar eruption with a morphologically anomalous root.

Case report

The patient, a 10-year-old girl, had an unremarkable health history with no dental complaints. Intraoral examination revealed late mixed dentition with eruption of all permanent incisors and the mandibular right first premolar and canine. Angle Class I occlusion with extreme crowding of anterior teeth and fissure dental caries in the first permanent molars were noted. Good oral hygiene and healthy soft tissues were observed.

The initial radiographic examination revealed a rootless second left premolar in the mandibular arch under a sound primary molar, with no signs of either infection or decay (Fig 1). The homologous premolar showed more than two-thirds of root developed. Normal root

resorption was evident in all of the remaining primary teeth. The second mandibular left primary molar was also in a stage of advanced root resorption, with no signs of pathology to explain the abnormal condition of the unerupted second left mandibular premolar. No family history of dental anomalies was reported. The second mandibular left primary molar was maintained for as long as possible, and orthodontic treatment was postponed to see if further changes or even improvements might occur at the root of the premolar. When the girl was 11 years old, the primary molar exfoliated and the premolar erupted at a normal rate, exhibiting normal crown morphology (Fig 2). In a few months the tooth reached the occlusal plane, with mobility no greater than normal. Intraoral radiographs showed no evidence of further root development. Occlusal films dismissed root dilaceration. A decision was made to extract the maxillary first premolars and the mandibular second premolars.

Histopathological study

The premolar (tooth #20) was examined macroscopically and crown enamel was normal with no alterations. The root region was cylindrical and 2 mm long with a moderate presence of adhered soft tissues (Fig 3).

Microscopic evaluation

Crown

Through a decalcification process, the enamel was eliminated, and the crown was left with dentin and



Fig 1. Periapical radiograph demonstrating no evidence of decay in the crown of second primary molar and the extremely short root of the unerupted premolar.



Fig 2. Quadrant view; note normal morphology of the second premolar.

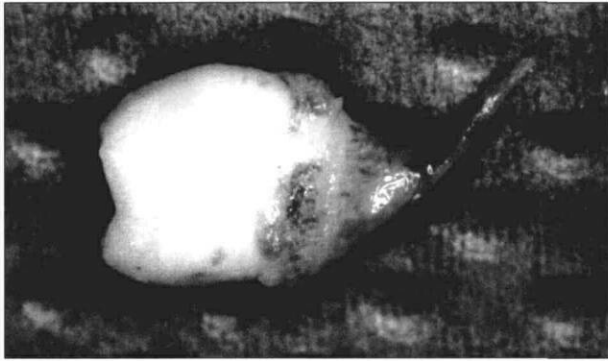


Fig 3. Macroscopic view of extracted tooth.

perfect preservation of the mantle and circumpulpal levels. No reactive dentin was noted. The pulp, within a large chamber, was perfectly organized both at central and marginal levels, where odontoblasts were arranged in a stratified epithelioid cylindrical form associated with a thick predentin layer.

Root

The short root section had a narrowing of the pulp chamber, with a superficial cementum layer associated with remnants of the periodontal ligament. The structure was, in general, similar to that of the crown, the perpendicular longitudinal arrangement of the dentin tubules at the dentino-pulpal limit being particularly evident in the histological sections. The superficial cementum formed a fine acellular layer with continuity between the cementum and the collagen bundles that extended to the limits of the piece. This surface cementum appeared normal and corresponded to the lateral surface; the apical margin consisted of a thick cellular cementum layer with wavy, festooned limits (Fig 4). A number of sections revealed complex combinations of both structures at the cementum-dentin interphase. No signs of resorption or dysplasia of the cementum or dentin were observed.

Discussion

The lesion may be considered a case of malformation, resulting from root development arrested shortly after its initiation.

An initial diagnosis of odontodysplasia and shell teeth was discarded due to normal deposition of enamel and dentin surrounding a normal pulp chamber. Additional considerations in establishing the diagnosis were arrested tooth development or delayed root formation. Arrested permanent tooth development has been reported⁵ as a consequence of pulpal infection of carious primary teeth. Present or past clinical features relating to the infection of the overlying primary molar could not be established in our case, however. Delayed root



Fig 4. Histological section corresponding to the lateral surface of the root, close to the apical margin; normal appearance is observed with no signs of resorption or dysplasia. PDL: Periodontal Ligament, D: Dentin, T: Transition, C: Cementum.

formation and abnormal tooth eruption also have been reported⁶ in a girl suffering from congenital kidney disease. Her general radiographic signs of radiolucent areas in the sockets of permanent teeth, other oral manifestations, and the documented kidney pathology suggested the diagnosis, and the teeth developed roots after eruption. None of these features corresponded to our observations in this case. Careful examination of tooth periapical morphology contributed to the possibility of external root resorption of unknown etiology. This may have been the final diagnosis, if extraction and subsequent histopathological examination had not been performed. Atrophied premolar roots are rare, with no previous cases reported in the literature. In the case presented, the condition did not prevent tooth eruption, though its etiology remains uncertain.

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