Preeruptive intracoronal resorption observed in 13 patients

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Introduction: The literature on preeruptive intracoronal resorption is sparse, comprising mainly reports of single patients. This study includes 13 patients with preeruptive intracoronal resorption, forwarded for consultation regarding diagnostics and etiology. The purposes were to determine which teeth are affected by the condition and describe how the defect is manifested radiographically. Methods: We used visual analyses of dental or panoramic radiographs. Results: The mandibular second molar appears to be the tooth that is most often affected by preeruptive intracoronal resorption. The resorption of the dentin in the molar crown was in the initial phases often seen in the medial aspects. The dentin in the crown could also be completely resorbed. The enamel contour encircling the dentin persisted as shown on the radiographs. In 1 maxillary canine, the dentin and enamel structures were completely disorganized by the resorption processes. Conclusions: Specialists in orthodontics are often the first to see radiographs of unerupted permanent teeth; therefore, they have a responsibility to be aware of the condition and refer these patients to an endodontist for treatment planning and prognosis before a decision is made regarding orthodontic treatment. (Am J Orthod Dentofacial Orthop 2012;142:129-32)

External and internal resorption of erupted permanent teeth is well documented in the scientific dental literature. Recently, the focus has been on the association between resorption patterns in the deciduous dentition and unexpected external root resorption in the permanent dentition.1 External root resorption in permanent teeth can appear and progress without any apparent cause.2 Successful treatment of these patients has not been reported. External resorption can also be provoked by cysts, trauma, or pressure from erupting teeth or orthodontic appliances.3 In these cases, the ongoing resorption process does not normally continue when the physical pressure subsides. The resorptive defects can be repaired by a thin layer of secondary cementum.4 Internal resorption is relatively rare and normally associated with physical trauma or caries-related pulpitis.5 The treatment involves endodontic therapy; in severe cases, extraction is needed.

Resorption of unerupted teeth is often a result of regional pathologic processes or ectopic eruption from neighboring teeth. Certain types of resorption of permanent unerupted tooth crowns have been described in case reports6-12 and also demonstrated in a textbook.5 Of the cited references, only Skaff and Dilzell7 described 2 patients; all other references reported only single patients.

Histologic studies of unerupted teeth with intracoronal resorption have shown that the change in the dentin is caused not by caries but by resorption from invagination of odontoclasts through minor defects in the enamel.6,9,11 The purposes of our study were to analyze 13 patients with preeruptive intracoronal resorption, determine which teeth are affected by the condition, and describe how the defect is manifested radiographically.

MATERIAL AND METHODS

The study included radiographs from 13 patients with preeruptive intracoronal resorption, forwarded from municipal dental services to the Department of Orthodontics, University of Copenhagen in Denmark, for consultation regarding diagnostics and etiology.
teeth affected by intracoronal resorption were 2 permanent teeth in the maxilla and 11 permanent teeth in the mandible.

In 1 patient, normal crown morphology of a maxillary canine was seen on the radiograph before eruption, but the dentin and enamel structures were completely disorganized by the resorption processes after eruption (Fig 1).

In another patient, complete resorption of the dentin was seen in the crown of a maxillary second molar, and a thin layer of enamel persisted (Fig 2).

A characteristic for these preeruptive dentin defects in mandibular premolars (2 patients) is that the enamel structure appears thin on the radiographs, whereas the dentin in the crown was completely resorbed. In 1 patient, a possible dentin defect was observed in a second molar (Fig 3).

Resorption of the dentin in the crown of the mandibular molars (9 patients) was often seen in the medial aspects, but the complete crown could also be resorbed (Figs 4 and 5). The enamel contour encircling the dentin often appeared thin and perhaps sporadically interrupted (Fig 4), although this was difficult to ascertain on the 2-dimensional radiographs.

For 1 patient, the radiographs taken 2 years apart were available, showing a mandibular second molar before eruption. The first radiograph showed seemingly...
normal dentin, and the second showed complete crown resorption (Fig 6). This indicates rapid progression of the resorption process.

Fig 5. Panoramic radiograph from a girl, aged 13 years 8 months, showing nearly complete preeruptive intracoronal resorption of the dentin in the mandibular right second molar. The inset is a magnification of the mandibular second molar.

Fig 6. Panoramic radiographs from the same girl, aged 9 years 9 months (upper) and 12 years (lower). The mandibular right second molar appears normal at the age of 9 years 9 months, but complete preeruptive crown resorption has developed during a 2-year period (lower). This demonstrates the rapid progression of preeruptive intracoronal resorption.

DISCUSSION

According to this study of 13 patients, the mandibular second molar appears to be most often affected. Of the 7 cited case reports on this subject, 5 describe the resorption defect in a mandibular second molar, and the textbook describes preeruptive resorption of a maxillary canine.5

The 13 patients all showed unexpected and severe resorption of the dentin in the unerupted permanent tooth crowns. Complete resorption of the crown might occur within a year or 2, as shown in Figure 6. We cannot verify whether there is a developmental defect in the enamel, as has previously been documented histologically in 3 case reports.6,9,11 The dentin might be hypomineralized, but no evidence for this was found in this study, although 1 patient, shown in Figure 3, had what could be a dentin defect. Hypomineralized dentin is not the cause but might in part explain the rapid progression of the resorption process. Another suggestion could be that these 13 patients had abnormal development of the crown follicle. This aspect should be investigated further in future studies.

CONCLUSIONS

The purposes of presenting these patients are to make specialists in orthodontics aware of preeruptive intracoronal resorption and to focus on which teeth are most often affected and how the condition is manifested on radiographs. Specialists in orthodontics are often the first to see the radiographs of unerupted permanent teeth; therefore, they have a responsibility to be aware of the condition, diagnose it, and consult with an endodontist for a treatment plan for the teeth with intracoronal resorption. Decisive for the orthodontic treatment plan is, first, the endodontist’s evaluation of whether the tooth can be preserved and the prognosis for the tooth. Only after this evaluation can the orthodontist determine a treatment plan. Since orthodontic treatment planning depends on diagnostics of the dentition, type of malocclusion, and cooperation, each patient with preeruptive intracoronal resorption requires an individual treatment plan. The only guidance recommended from this study would be to consult an endodontist in the initial phase.

REFERENCES