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External cervical resorption of a primary canine

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Summary. The authors describe the case of a 3-year-old boy who presented with a mobile right maxillary primary canine. Clinical examination revealed this tooth to have an abnormally large crown, which appeared to have sustained a crown–root fracture. Periodontal probing depths of 5 mm were detected around the tooth. Radiographically, there was a marked constriction at the cementoenamel junction with associated alveolar rarefaction. Both upper primary canines were subsequently removed under general anaesthetic and the right canine was subject to histopathological investigation. A diagnosis of external cervical resorption was made. A review of the literature confirmed this to be a very unusual case presentation.

Introduction

Resorption of dental hard tissues is generally classified as internal or external, although combinations of both types can occasionally be found on the same tooth [1]. External resorption is categorized according to its clinical and histopathological features as follows: external surface resorption; external inflammatory root resorption; and replacement resorption [2]. External inflammatory root resorption is further subdivided into cervical or apical resorption. Tooth resorptions, as a whole, are not uncommon. A study of 708 patients found that 86% of permanent teeth had radiographic evidence of some root resorption [3]. Epidemiological data for the primary dentition are not available [4].

A clinical diagnosis of tooth resorption is often made following an incidental radiographic finding. This is because most cases remain asymptomatic until resorption reaches an advanced stage. Teeth with marked resorption may present with mobility, pathological fracture or a 'pink spot' lesion of the crown.

In the primary dentition, root resorption, leading to tooth exfoliation, is considered a normal physiological process unless it occurs prematurely. However, other types of resorption may reflect an underlying pathological process. In such cases, resorption may arise as a sequela of injury or inflammation of the periodontal ligament and/or tooth pulp. A number of specific aetiological factors have been implicated, including: trauma; orthodontic tooth movement; periodontal infection; bone lesions (cysts and neoplasms); internal bleaching procedures; impacted teeth; and systemic disease [5,6]. In some cases, there is no identifiable cause and authors have used the term idiopathic resorption [7,8]. A further factor believed to contribute to the development of cervical resorption, in particular, is the anatomical status of the cementoenamel junction [9]. Developmental defects of the cementum in this region lead to dentine exposure, which, in turn, may predispose the tooth surface to resorptive processes.

The actual cellular mechanisms underlying resorption are complex. Injury or inflammation of the dental hard tissues leads to chemical changes and the release of numerous inflammatory mediators. These, in turn, may promote inflammatory cell recruitment or the formation of multinucleated giant cells (osteoclasts and odontoclasts), which are specifically involved in tissue resorption [2,10].

Case report

A 3 year 11 month old Caucasian boy was referred to the authors' paediatric dentistry clinic by his general

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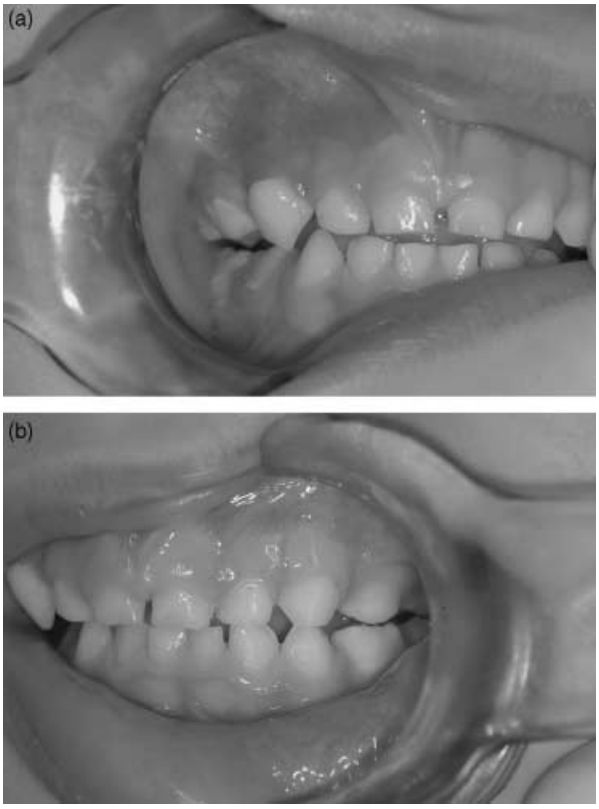

Fig. 1. (a) Right and (b) left clinical photographs showing a large, bulbous maxillary right primary canine.

dental practitioner for an urgent opinion regarding an abnormal right maxillary primary canine. The presenting complaint was of a mobile and painful tooth. A history revealed that this canine had only erupted 2 months previously, some 2 years after the eruption of the contralateral canine. The tooth had been reportedly painful to pressure for the previous 2–3 days. There was no history of orofacial trauma, and the child was otherwise fit and well. Further enquiry excluded any family history of dental abnormalities.

Clinical examination revealed a healthy-looking boy, who was on the twenty-fifth percentile for height and weight. Intraorally, there was a complete and caries-free primary dentition. However, it was noted that the maxillary right canine (53) had a large crown size in comparison to the contralateral canine (63), and the tooth was tender and mobile on gentle finger pressure (Fig. 1). Periodontal examination revealed healthy-looking gingivae, but probing depths of 5 mm around 53.

An intraoral radiograph, provided by the referring dentist, revealed that the 53 had an abnormal appearance (Fig. 2). There was a marked constriction in the region of the cementoenamel junction. In addition, there appeared to be a crescentic radiolucent defect involving the associated alveolar bone. Right and left lateral oblique radiographs excluded any dental or bony abnormalities involving the posterior regions. The diagnosis was of a localized developmental dental anomaly that had resulted in a cervical crown–root fracture. A consultant radiographic opinion was sought, but although the alveolar bone loss was considered to be infective in origin, a more definitive diagnosis could not be given.

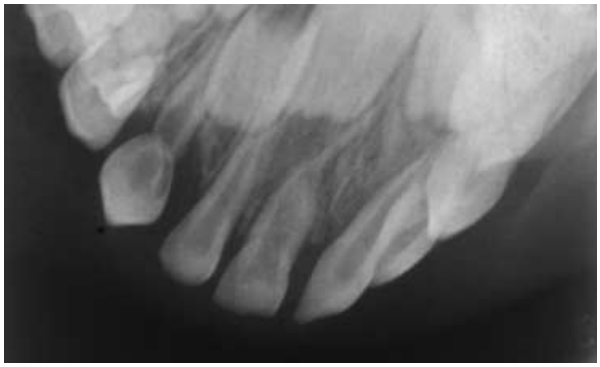

Fig. 2. Upper standard occlusal radiograph showing constriction at the cementoenamel junction of the maxillary right primary canine and an associated alveolar bony defect.

The patient subsequently underwent the removal of both maxillary primary canines under general anaesthesia. The 63 was removed to prevent any future upper centre line shift. At the time of surgery, 53 was indeed found to have a horizontal crown–root fracture just below the gingival margin. The crown of the tooth appeared bulbous and severely undermined (Fig. 3). Curettage of the 53 socket was performed and bone fragments, together with the dental tissue, were sent for histopathological examination.

Microscopic examination of the decalcified bony fragments revealed trabeculae of vital woven bone separated by moderately vascular fibroblastic connective tissue. Occasional osteoclasts were observed. The decalcified tooth sections showed evidence of marked dentine resorption affecting both the coronal and root dentine (Fig. 4). Bacterial plaque was seen to line the resorbed dentine surface. The resorption cavity appeared to communicate with the residual radicular pulp chamber; the latter was well occupied by well-vascularized and relatively uninflamed cellular tissue that showed evidence of metaplastic bone formation (Fig. 5). It was felt that these findings

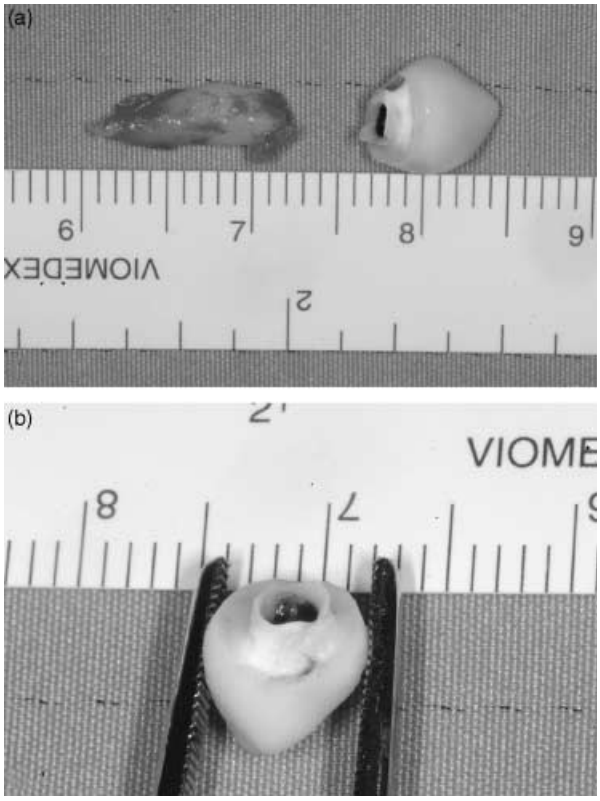

Fig. 3. (a) Extracted maxillary right primary canine with a pathological crown–root fracture. (b) Undermined and bulbous crown with macroscopic evidence of extensive cervical resorption.

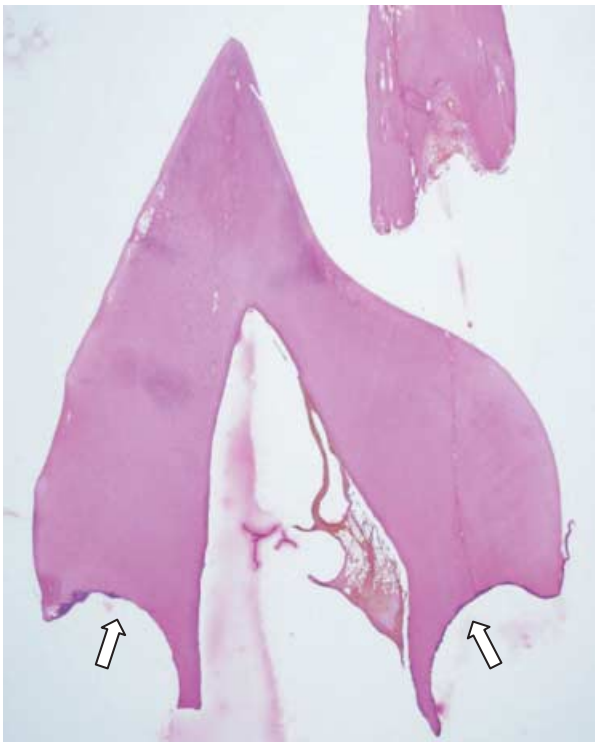

Fig. 4. Haematoxylin and eosin section of the crown of a decalcified maxillary right primary canine showing extensive resorption in the cervical region (arrows).

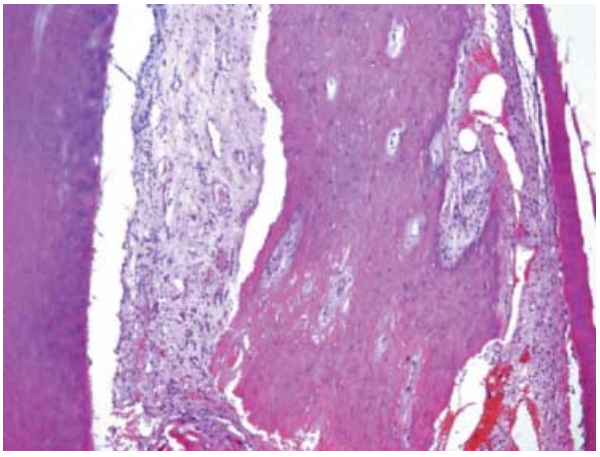

Fig. 5. Haematoxylin and eosin section of a resorption cavity showing vital radicular pulp and metaplastic bone formation.

were consistent with a diagnosis of external cervical tooth resorption.

Postoperative review of the patient revealed good healing and he was discharged to the care of his general dental practitioner for subsequent follow-up. Specific advice was given to monitor the development of the permanent dentition, particularly in the affected region.

Discussion

External cervical inflammatory root resorption (invasive cervical resorption) is a common type of resorption [2]. It may be transient or progressive, depending on whether the source of the inflammation is removed or not. Previous reports concerned with the permanent dentition have described the progressive nature of this condition, which, in some cases, has led to pathological crown–root fracture at the cervical margin [6,7,11]. To date, there appears to have been only one previous report of cervical root resorption involving the primary dentition. Kim and Heffez [8] described the case of a fit and healthy 7-year-old girl who was found to have multiple cervical resorption lesions affecting her entire primary dentition. Therefore, it would seem that invasive cervical resorption of the primary dentition is either very unusual or poorly reported.

External cervical inflammatory resorption is believed to stem from inflammation or trauma of the

associated periodontal tissue. In the case presented, an underlying chronic inflammation of the periodontal tissue was evident because of the increased probing depths associated with this tooth. It is speculated that there may also have been an associated morphological abnormality at the cememtoenamel junction which predisposed the tooth to resorption. Interestingly, the canine had only recently erupted, and thus, it is possible that the resorptive process had commenced prior to eruption. This is unusual in itself [12]. It is hypothesized that some oral communication may have been present for some time, allowing the ingress of oral bacteria and the resultant chronic inflammation. Sullivan and Jolly [13] reported that external cervical root resorption could, in fact, be detected by subgingival probing since loss of Sharpey's fibres in the affected area would result in periodontal pocket formation.

An important diagnostic feature of external resorption is the preservation of a layer of dentine immediately around the pulp. This region of dentine appears very resistant to resorption and presents radiographically as a clear radiopaque 'boundary' around the pulp chamber [14]. In cases where it is difficult to clinically differentiate between external and internal resorption, the presence of this radiopaque line, demarcating the outline of the root canal, helps to distinguish external root resorption [10,15]. This radiopaque shell was clearly seen in the case described (Fig. 2).

Treatment of external cervical inflammatory resorption has been described for the permanent dentition. It is suggested that thorough curettage of the resorptive lesion, followed by restoration with glass ionomer cement, may halt the resorptive process [10]. Treatment options for the primary dentition have not been discussed in the literature. However, in the case described here, the advanced stage of resorption meant that extraction was the only realistic approach.

What this case report adds

- It describes the clinical, radiographic and histopathological presentation of an unusual case of external cervical resorption in a primary tooth.
- It provides the reader with an update on the aetiology of external cervical resorption.
- It highlights the presence of a clearly demarcated shell of dentine around the pulp chamber as being an important diagnostic feature of external rather than internal, root resorption.

Résumé. Ce cas décrit un jeune garçon de 3 ans présentant une canine primaire maxillaire droite mobile. L'examen clinique a révélé que cette dent avait une couronne anormalement large, qui semblait avoir subi une fracture corono-radiculaire. Le sondage parodontal a révélé une profondeur de poche de 5 mm autour de la dent. Radiographiquement, il y avait une constriction marquée à la jonction cémento-amélaire avec une raréfaction alvéolaire associée. Les deux canines primaires maxillaires ont été extraites sous anesthésie générale et la canine droite soumise à un examen histo-pathologique. Un diagnostic de résorption cervicale externe a été posé. Une revue de littérature a confirmé qu'il s'agissait d'une situation inhabituelle.

Zusammenfassung. Dieser Fall beschreibt einen 3jährigen Jungen mit einer Lockerung des rechten Oberkiefer Milcheckzahns. Die klinische Untersuchung zeigte eine ungewöhnlich große Zahnkrone, welche anscheinen eine Kronen/Wurzelfraktur erlitten hatte. Sondierungstiefen bis 5 mm wurden um den Zahn gemessen. Röntgenologisch war eine ausgeprägte Konstriktion der Schmelz-Zement-Grenze zu erkennen in Verbindung mit einer alveolären Rarefikation. Beide OK Milcheckzähne wurden daraufhin unter Vollnarkose entfernt, der rechte wurde histopathologisch untersucht. Die Diagnose einer externen Resorption wurde gestellt. Eine Literaturübersicht bestätigt, dass es sich um einen sehr ungewöhnlichen Fall handelt.

Resumen. Se describe el caso de un niño de 3 años que se presentó con movilidad de un canino primario superior. El examen clínico reveló que este diente tenía una corona anormalmente ancha, que parecía contener una fractura corono-radicular. Se detectaron alrededor del diente profundidades periodontales de 5 mm. Radiográficamente había una constricción marcada en la unión amelo-cementaria con rarefacción alveolar asociada. Ambos caninos superiores se eliminaron posteriormente bajo anestesia general y se sometió a investigación histológica el canino derecho. Se hizo el diagnóstico de reabsorción cervical externa. Una revisión de la literatura confirmó que éste era un cao de presentación muy raro.

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