

Case Report Article

Diagnosis and clinical management of pre-eruptive intracoronal resorption – a case report

Bianca Fiorentin Moura¹
Gustavo Ricardo Silveira²
Sinval Adalberto Rodrigues-Junior^{1, 3}

Corresponding author:

Sinval Adalberto Rodrigues-Junior
Universidade Comunitária da Região de Chapecó
Área de Ciências da Saúde – Caixa postal 1141
Av. Senador Atilio Fontana, n. 591-E – Efapi
CEP 89809-000 – Chapecó – SC – Brasil
E-mail: rodriguesjunior.sa@unochapeco.edu.br

¹ School of Dentistry, Universidade Comunitária da Região de Chapecó – Chapecó – SC – Brazil.

² Private clinic – Chapecó – SC – Brazil.

³ Health Sciences Postgraduate Program, Universidade Comunitária da Região de Chapecó – Chapecó – SC – Brazil.

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Abstract

Introduction: The pre-eruptive intracoronal resorption is a caries-like lesion frequently located in dentin underneath the dentin-enamel junction in the occlusal face of the tooth crown. Due to the resemblance with carious lesions, this lesion is often referred to as 'pre-eruptive caries', although its pathogenesis has no correlation with the carious mechanism. **Objective:** This case report describes the diagnosis and clinical management of a permanent second molar presenting intracoronal pre-eruptive resorption, highlighting the possible clinical conducts associated. **Case report:** Diagnosis of the condition was accidental, through routine panoramic radiograph taken for orthodontic reasons. The therapeutic option involved the surgical exposure of the non-erupted tooth, exposure of the lesion and removal of the tissue from the resorbed area. Restoration was performed using glass ionomer cement followed by composite resin. At the 9-month follow-up the patient presented no further clinical symptom of recurrence of the resorption or pain. **Conclusion:** Despite being a relatively rare condition, clinicians should be aware of the possibility of PEIR occurrence and perform a cautious radiographic examination.

Introduction

Pre-eruptive intracoronal resorption (PEIR) is a condition characterized by the presence of a radiolucent lesion with varying depths located at the coronal dentin of non-erupted teeth, adjacent to intact enamel [1]. In most cases, a single tooth is affected, although cases involving several teeth have also been reported [15]. Due to the resemblance with carious lesions, this lesion has been referred to as 'pre-eruptive caries' [4], although the correct term used to characterize its nature is 'pre-eruptive intracoronal resorption' - PEIR [1, 9].

The pathogenesis of the PEIR is not clear, since the non-erupted tooth is not susceptible to be infected with cariogenic microorganisms [14]. Normally a single tooth is affected and approximately half the lesions extend to more than two thirds of the dentin thickness [1, 10]. No association has been found between the PEIR and gender, race, medical conditions, systemic conditions or fluoride supply [10, 11, 14].

The diagnosis is usually based on routine bitewing or panoramic radiographs. Nevertheless, most lesions remain hidden until there is pulpal involvement or fracture of cusps due to extensive cavitation [13]. PEIR may be an important cause of uncommon pulpal abscesses in children whose teeth present a short eruption time span [1].

The aim of this case report is to describe the diagnosis and clinical management of a manifestation of PEIR in a non-erupted lower second molar, including a 9-month follow-up.

Case report

A 14-year-old female patient searched for pediatric dental treatment in Chapecó, Southern Brazil, presenting no relevant clinical symptoms or complaints. A panoramic radiograph, taken for orthodontic reasons (figure 1) revealed the presence of an extensive radiolucent lesion in occlusal dentin underneath the enamel-dentin junction in the non-erupted permanent mandibular left second molar.



Figure 1 - Panoramic radiograph showing a caries-like lesion in the coronal dentin of the non-erupted tooth 37

Medical history revealed no systemic disease or allergy. However, the patient presented agenesis of the maxillary lateral incisors and mandibular second premolars. The clinical exam revealed that the alveolar mucosa distal to the first molar

presented normal color, texture, and contour (figure 2.A). The presence of a radiolucent area in the occlusal dentin of the non-erupted mandibular second molar was confirmed with a periapical radiograph.

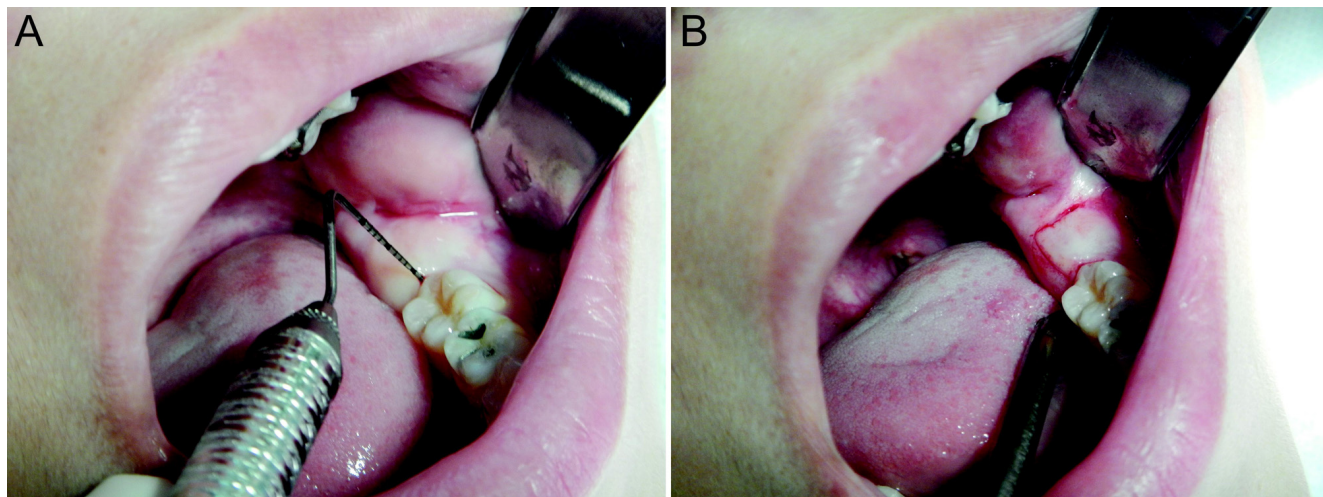


Figure 2 - Probing of the alveolar mucosa distal to the tooth 36 (A); Surgical delimitation of the gingival tissue covering the crown of the non-erupted tooth 37 (B)

The lesion was diagnosed as a pre-eruptive intracoronal resorption that did not involve the periapical region of the tooth. Therefore, the treatment decision involved surgical access for removal of the tissue present in the reabsorbed area, followed by restoration of the coronal cavity.

Local anesthesia was administered in the region (2% lidocaine solution with 1:100.000 adrenaline). The gingival tissue over the non-erupted second molar was surgically delimited (figure 2.B) and, following, removed, revealing the occlusal surface of the second molar (figure 3.A). The occlusal surface

was probed (Figure 3.B) and, then, a cavity was opened with high speed bur. The tissue found in the cavity was non-bleeding and pale-pink colored, similar to the conjunctive tissue (Figure 4.A), and was removed with an excavator. The cavity floor was hard to probing and white-colored and no contact with the pulp tissue was identified (figure 4.B). The cavity was filled with conventional glass ionomer cement (Maxion R, FGM, Joinville, SC, Brazil) (figure 5.A). After the procedure, a periapical radiograph was taken to verify the marginal adaptation of the glass ionomer cement (figure 5.B).

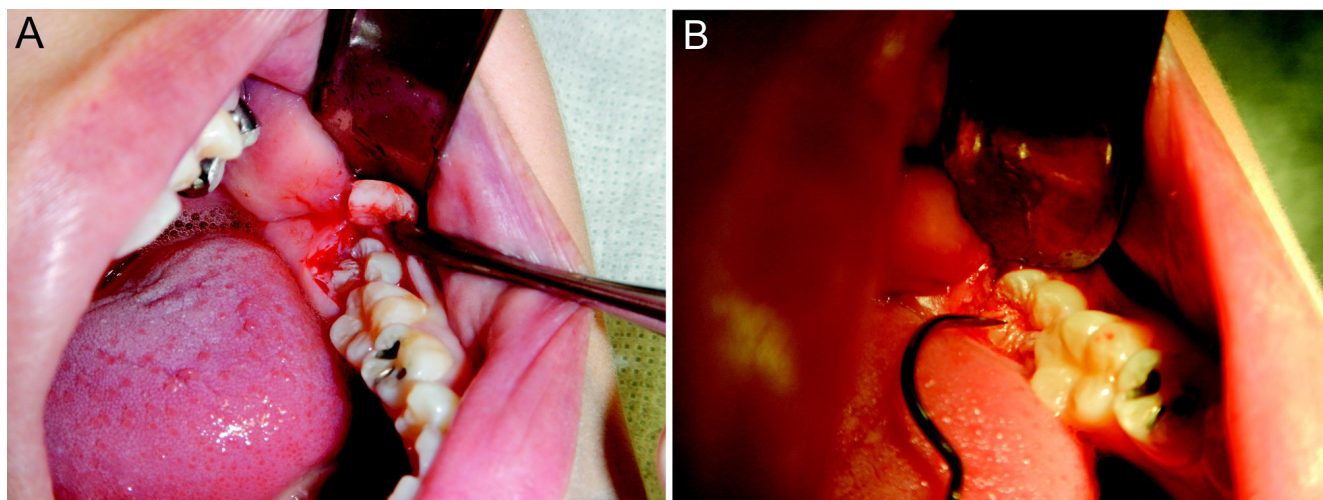


Figure 3 - Surgical exposure of the crown of the non-erupted tooth 37 (A); Probing of the occlusal surface of the tooth presenting the coronal dentin resorption (B)

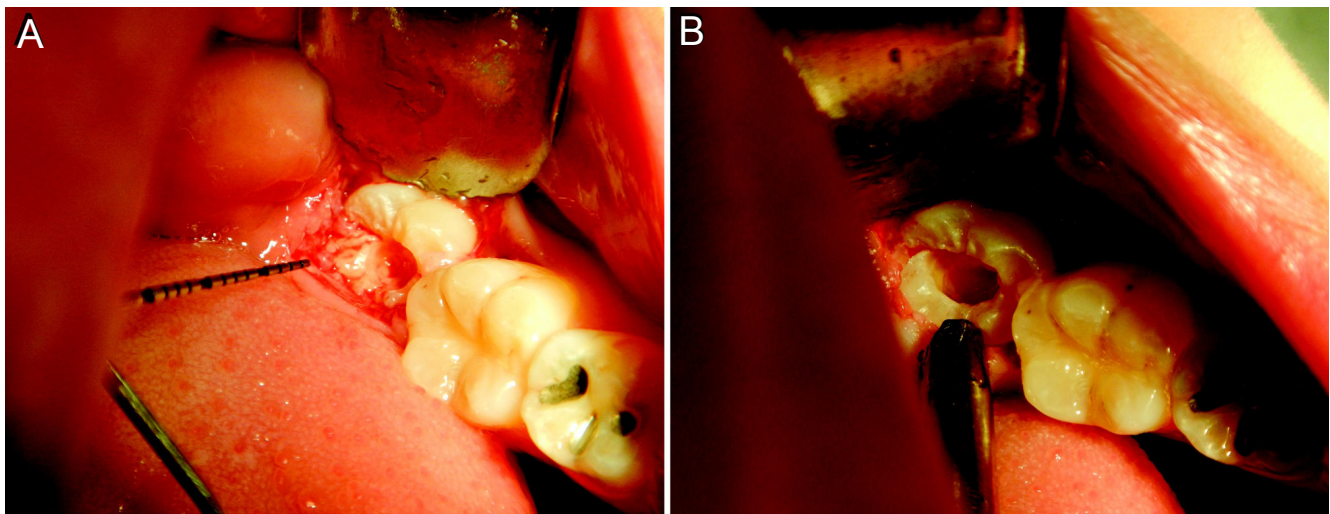


Figure 4 - Clinical aspect of the connective tissue-like lesion on the occlusal cavity of the tooth 37 (A); Clinical aspect of the cavity after the tissue removal (B)

Six months after the procedure, the patient returned for follow-up. Endofrost (Wilcos, Petrópolis, RJ, Brazil) was applied to the buccal surface of the tooth and accused pulp vitality. A periapical radiograph was taken and no alteration was observed either in the temporary filling or the periapical tissues. Since the tooth was partially erupted, rubber dam isolation was not possible.

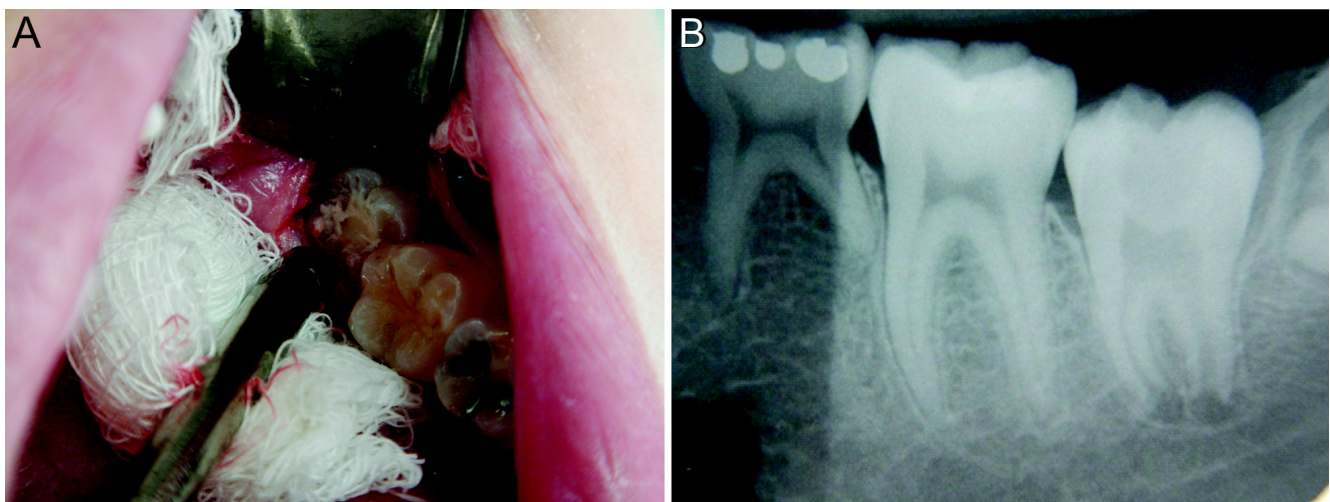


Figure 5 - Trans-surgical temporary sealing of the cavity with glass ionomer cement (A); Post-surgical radiographic aspect of the temporary sealing (B)

Nine months after the surgical procedure and with the tooth completely erupted, vitality test was repeated and accused pulp vitality. Following, rubber dam isolation was performed and the temporary filling was totally removed using a diamond bur at high speed under water cooling. The option for removing the glass ionomer cement was due to the fact that it was inserted during surgery with no visual certainty of lack of contamination. The cavity was visually inspected and the glass ionomer cement was inserted as liner material (figure 6.A and B).

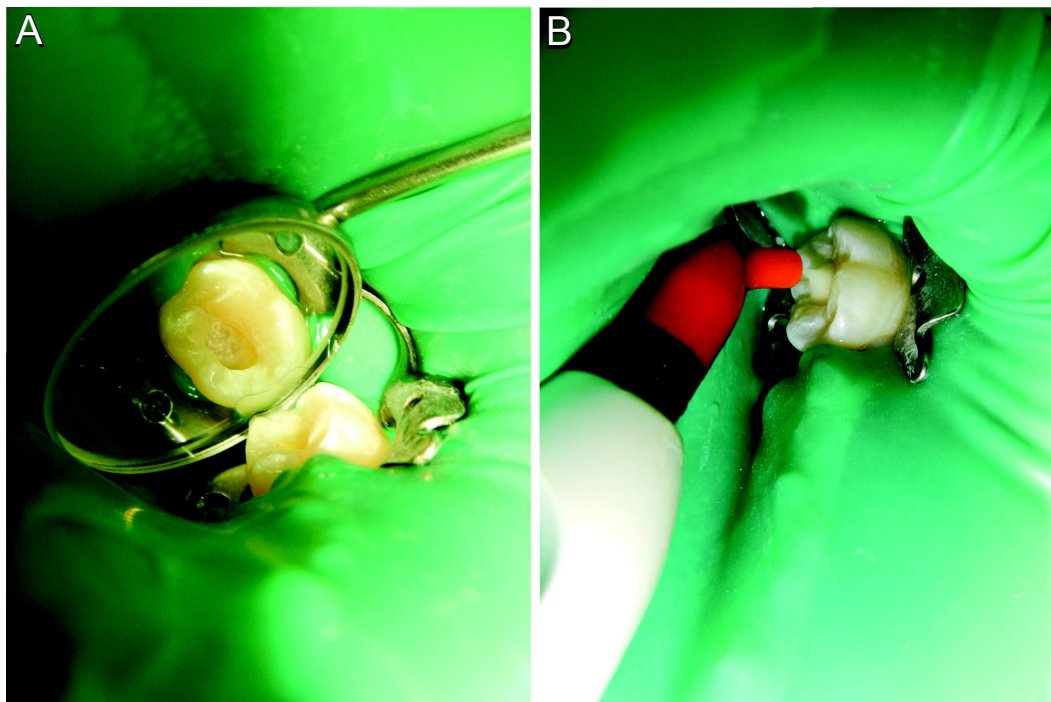


Figure 6 - Aspect of the cavity at the 9-month follow-up after removal of the glass ionomer cement (A); Insertion of a new layer of base glass ionomer cement (B)

Enamel and dentin were etched with phosphoric acid gel for 30 and 15 seconds, respectively. The phosphoric acid was washed out for 30 seconds with water jets and the two-step etch-and-rinse adhesive system Adper Single Bond 2 (3M/ESPE, St. Paul, MN, USA) was applied according to the manufacturer's instructions. After having its solvent evaporated for 30 seconds with the aid of gentle

air jets, it was light cured using a LED light-curing unit producing more than 300 mW/cm² (Emitter C, Schuster, Santa Maria, RS, Brazil). The restorative composite Charisma (shade A2, Heraeus Kulzer, Hanau, Germany) was incrementally inserted and each layer was light cured for 20 seconds. Figure 7 shows the clinical and radiographic aspect of the final restoration.

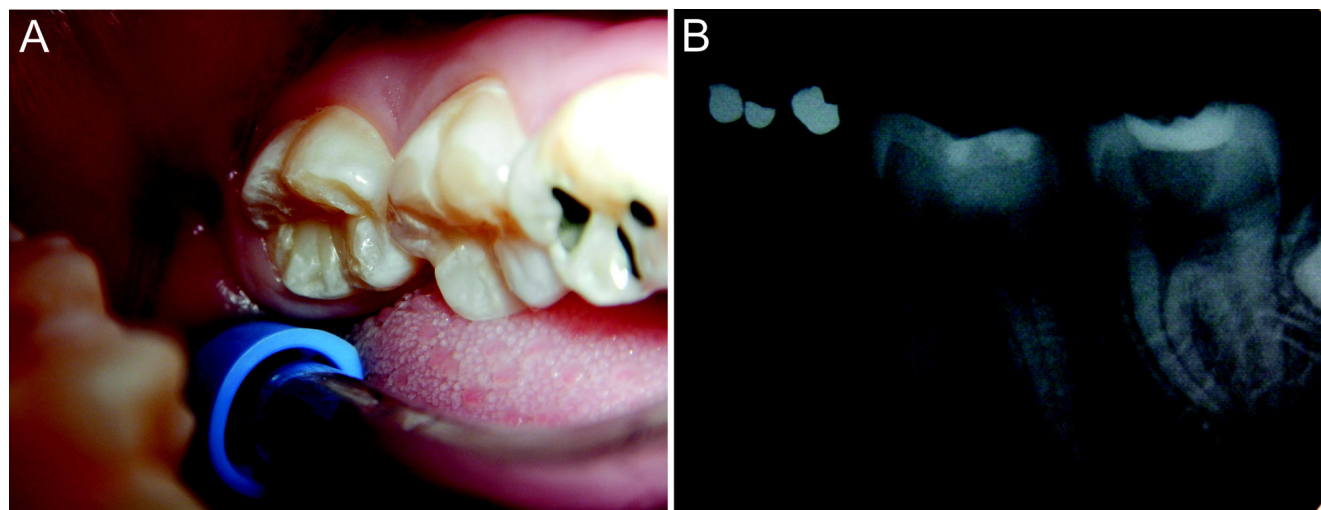


Figure 7 - Tooth 37 after coronal restoration with composite resin (A); Radiographic aspect of the cavity lined with glass ionomer cement and restored with composite resin (B)

Discussion

This case report described the accidental diagnosis of an asymptomatic pre-eruptive intracoronal resorption occurring in a permanent mandibular second molar through a panoramic radiograph taken for orthodontic reasons. Younger subjects are more prone to have this condition diagnosed in panoramic radiographs, since non-irrupted teeth are assessed radiographically more often in such age due to orthodontic planning [12]. According to Uzun *et al.* [16], these lesions have no obvious predilection for race or gender; another study revealed that the most commonly affected teeth were the lower second molars [8]. Lesions of this nature often progress asymptotically and, hence, are difficult to diagnose, strongly depending on the dental professional awareness during radiographic examination [16].

Dental literature has reported a prevalence of PEIR lesions varying from 1.55% to 6% [8, 11]. Most recently, though, a large scale multicenter study involving a population of almost 30,000 people identified a 0.7% prevalence of PIER [16]. According to the authors, the discrepancy in prevalence values may derive from diagnosis standards of what is assumed to be PEIR in different radiographic techniques. In spite of that, it is fair to assume that there is little information on the epidemiology of PEIR in dental literature, as well as on factors, if any, that might favor its appearance [6].

Typically, ostensibly intact superficial enamel is observed in the radiograph, resembling the characteristics of 'occult caries' or 'hidden caries' [12]. Regardless, prior evidence reveals that it is not likely that these lesions occur due to infection and demineralization of the non-irrupted tooth [6, 11]. Histology of the tissue present in the lesions showed a soft tissue containing spindle-shaped cells that resemble fibrous connective tissue cells and resorptive cells, such as multinucleated osteoclasts and macrophages [6]. Other differential diagnosis could include enamel hypoplasia or Turner's hypoplasia; however, both conditions would present other signs, such as prior infection or other hypoplastic teeth [1], which were not observed.

The natural course of PIER is usually slow before the tooth's eruption and is hardly associated to pain or any other clinical symptom until the lesion reaches the pulp [12]. On the other hand, these lesions tend to be rapidly colonized by microorganisms when the tooth erupts and to evolve into carious lesions of rapid progression with potential to cause pulpal abscesses [1]. Therefore,

it has been recommended that the management of PIER should focus on the early diagnosis and treatment [12], including the surgical exposure of a non-irrupted tooth as soon as the lesion is recognized aiding at the arrestment of the resorption and the restoration of the tooth's crown [2, 5, 9]. The decision for the surgical treatment in this case was taken considering that, even though the lesion did not compromise the pulp at the moment of discovery, it was deep and could evolve causing pain.

Removal of the resorptive tissue in this case was followed by filling of the cavity with conventional glass ionomer cement, due to benefits this material provides as temporary filling, namely, minimal tooth preparation, adequate viscosity for insertion using a centrix syringe and quick adjustment [2]. Additionally, the chelation reaction to the tooth calcium provides adhesion to the tooth structure and the low molecular weight of the polyalkenoic acid provides sufficient biocompatibility for medium to deep cavities [3]. Fluoride release was not considered a benefit in this case, since the remaining cavity floor was sufficiently hard at probing and there was no cariogenic challenge to fight against.

The restorative treatment was finished by confection of a composite resin restoration in the occlusal face of the tooth using a two-step etch-and-rinse adhesive system. One of the limitations of glass ionomer cements as restorative materials is the low mechanical resistance when inserted in stress-bearing areas. This behavior becomes clear when one considers the 7.2% annual failure rate of this material in stress-bearing posterior restorations [7]. Comparatively, the 2.2% annual failure rate of composite restorations reinforces the indication of composite resins in posterior restorations [7]. No clinical or radiographic symptom was observed at the 6-month or the 9-month follow-up, confirming the short-term success of the treatment.

The treatment prognosis relies on the size of the lesion when discovered and on the tooth maturation; these factors will determine whether it may compromise the pulp and the development of the root canal system.

Conclusion

Pre-eruptive intracoronal resorption is a rare condition. Therefore, dentists should be aware about its occurrence and examine carefully dental radiographs involving non-erupted teeth, since the early diagnosis is of utmost importance for determination of the treatment plan and prognosis.

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