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CASE REPORT

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Lesion sterilization and tissue repair of primary molar to the eruption of its permanent successor: a case report

Esterilização da lesão e reparação de tecidos de molar decíduo: relato de caso clínico até a erupção do permanente sucessor

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ABSTRACT

The aim of this study is to report a clinical case of lesion sterilization and tissue repair in primary molar, with follow-up until the eruption of the permanent successor. A 6-year-old male patient came to the Pediatric Dentistry Clinic at Faculdade Sao Leopoldo Mandic in Campinas-SP, with his mother, complaining of "caries in several teeth". On clinical examination, it was found that tooth 85 had a severe carious lesion with pulp involvement and fistula. Radiographically, radiolucency was observed in the furcation region. It was then decided to perform lesion sterilization and tissue repair of the tooth with CTZ paste. After 6 months of the procedure, the tooth was clinically and radiographically normal and after 3 years it was observed that tooth 85 was in complete root resorption. After extraction, the permanent successor erupted naturally without clinical or radiographic alterations. It can be concluded that the present clinical case demonstrated success in the use of CTZ paste in the lesion sterilization and tissue repair of primary molars, until the complete eruption of the permanent successor.

KEYWORDS

Primary tooth; Pulpectomy; Pediatric dentistry; Endodontics; Case report.

RESUMO

O objetivo desse estudo é relatar o caso clínico de esterilização da lesão e reparação de tecidos em molar decíduo com pasta CTZ, com acompanhamento até a erupção do pré-molar sucessor. Paciente do sexo masculino, 6 anos de idade, apresentou-se à Clínica de Odontopediatria da Faculdade São Leopoldo Mandic em Campinas-SP, acompanhado de sua mãe, queixando-se de "cárie em vários dentes". Ao exame clínico, verificou-se que o dente 85 apresentava lesão de cárie severa com envolvimento pulpar e fístula. Radiograficamente, observou-se radiolucidez na região de furca. Optou-se, então, por realizar a esterilização da lesão e reparação de tecidos do dente com pasta CTZ. Após 6 meses da realização do procedimento, o dente apresentava-se clinica e radiograficamente normal e após 3 anos observou-se que o elemento 85 estava em rizólise completa. Feita a extração, o permanente sucessor erupcionou naturalmente sem alterações clínicas ou radiográficas. Pode-se concluir que o presente caso clínico demonstrou sucesso do emprego da pasta CTZ na esterilização da lesão e reparação de tecidos de molar decíduo, até completa erupção do permanente sucessor.

PALAVRAS-CHAVE

Dente decíduo; Pulpectomia; Odontopediatria; Endodontia; Relato de caso clínico.

INTRODUCTION

The primary teeth have unique importance on aesthetics, phonation, chewing and psychological well-being for the child. They are also essential for the maintenance of space and for the correct eruption of the permanent tooth [1-6]. Because of this, they must remain in the mouth in healthy conditions until their cycle is complete [1,4]. Endodontic treatment of the primary tooth is a treatment option to its maintenance in the arch when the integrity of the pulp has been irreversibly affected by caries or dental trauma [2-4,7].

In 1959, Soller and Cappiello published an endodontic technique that does not perform the instrumentation of the root canals and uses an antibiotic paste composed of tetracycline, chloramphenicol and zinc oxide and eugenol [3,7-9]. This simple technique can be used on teeth with pulp necrosis and performed in a single session [2,8,10]. This facilitates endodontic therapy in children, as it reduces the clinical time, especially those with behavior that is difficult to manage [2,5,7,8].

Recently, the American Association of Pediatric Dentistry renamed this procedure as lesion sterilization and tissue repair (LSTR). It usually has no instrumentation of the root canals but, instead, an antibiotic mixture is placed in the pulp chamber which is intended to disinfect the root canals [11].

The CTZ paste has antibacterial activity [9,12,13], promotes stabilization of bone resorption, does not cause tissue sensitivity [2,5] and does not interfere with the physiological resorption of the deciduous [3]. Despite some published clinical studies, the literature still lacks studies that verify the influence on the development and eruption of the permanent successors [2,7]. Therefore, the present study aims to report a clinical case of lesion sterilization and tissue repair in primary molar, with follow-up until the eruption of the permanent successor.

CASE REPORT DESCRIPTION

Six-year-old male patient came to the Odontopediatrics Clinic at Faculdade São Leopoldo Mandic in Campinas-SP, with his mother and a complaint of "caries in several teeth". Patient's assent and guardian's consent were requested and approved.

On clinical examination, it was found that tooth 85 had a severe carious lesion with pulp and fistula involvement. The patient reported no pain or sensitivity in the tooth. Radiographically, radiolucency was observed in the furcation region and the presence of the successive permanent tooth germ in Nolla stage 5 (Figure 1A).

It was then decided to perform the endodontic treatment of this tooth with CTZ paste and to restore the tooth with high viscosity glass ionomer cement (Figure 1B). The other teeth of the patient with caries lesions did not need endodontic treatment and were treated according to protocols established in the literature [14].

We chose to perform endodontic treatment with CTZ paste because of the difficulty in handling the patient and, at the same time, because of the importance of maintaining the primary tooth, considering the stage of formation of the permanent successor.

The access to the pulp chamber was performed with a diamond spherical bur under rubber dam isolation. Duct irrigation was carried out with 0.5% sodium hypochlorite solution and suction with the aid of hypodermic needles. The pulp chamber was then dried with sterile cotton and filled with CTZ paste (Formula e Acao, Sao Paulo, BRA). The filling material was pushed until it penetrates the entry of the root canals. At the end, a thin layer of gutta-percha (Dentsply Sirona, Ballaigues, SWI) was placed as a new floor of the pulp chamber and the tooth was restored with high viscosity glass ionomer cement (Fuji IX® GC America, Alsip, USA).

Figure 1 - Periapical radiographs: (A) before treatment of the deciduous molar; (B) immediately after endodontic treatment of the deciduous molar; (C) six months after treatment; (D) three years after treatment; (E) after the eruption of the permanent successor.

Six months later, tooth 85 was reexamined clinically and radiographically. There was clinical normality (absence of fistula and painful symptoms) and decreased radiolucency in the furcation area (Figure 1C). Three years after the endodontic treatment, the patient returned to the clinic for routine check and found that the tooth 85 was in complete root resorption (Figure 1D). The tooth was extracted and two weeks later, the permanent successor (tooth 45) erupted without clinical and radiographic enamel alterations (Figure 1E).

DISCUSSION

The complexity of endodontic treatment on primary teeth has led researchers to seek simplified techniques [7,9,15]. Considering the difficulty of mechanical chemical preparation in primary teeth, antibiotic pastes represent one of the most important aspects to achieve the success of endodontic treatment [2,3,7,13]. Antibiotic pastes such as CTZ act at a distance and reduce the number of microorganisms and even modifying their pathogenicity [6,8,16].

Endodontics of primary molars with CTZ paste is a technique that is based on sterilization and repair of periapical tissue [9,11,15]. The paste consists of a powder composed of two broad-spectrum antibiotics, chloramphenicol and tetracycline, zinc oxide and a liquid, eugenol, which also has antimicrobial action [2,5,8-10].

Dental resorption on the floor of the pulp chamber exposes the dentinal tubules, transforming it into a biological sieve [17]. This feature requires us to be even more careful in the choice of drugs used in the primary of pulp therapy. The wrong choice can trigger furcation lesions and alterations in the follicular tissues of the permanent germ, which can generate localized enamel hypoplasia.

Several authors have studied the antimicrobial effect of the CTZ paste. In two studies, the formation of a halo of bacterial inhibition and effectiveness in the antimicrobial activity of the CTZ paste was verified [4,16]. Histopathological analysis showed an intense inflammatory process right after the treatment, which turned into a mild chronic inflammatory process with quantitative and qualitative reduction in the density of collagen fibers. These findings point to therapeutic properties of the paste [9]. The periodontal ligament remained intact during all the cases studied [18].

In humans, biological effects are assessed through the response of the pulp and periapical tissues during the use of materials [6,18]. In clinical practice, treatment success is assessed by remission of clinical and radiographic signs and symptoms found prior to treatment [18].

Clinically and radiographically, the results of the studies are generally positive. Siegl et al [4] evaluated the radiolucent area in the furcation region in primary molars treated with CTZ and with Guedes-Pinto paste over a 12-month period. Clinically, the response was similar, but the reduction in the radiolucent area was only seen in teeth treated with CTZ paste, which can be explained by its antimicrobial action. Similar results were found by other authors [14,19]. Absence of painful symptoms, fistula, mobility incompatible with chronological age and eruption of the permanent in a healthy way were parameters considered for the assessment of clinical success. According to clinical studies, pulp therapy performed with CTZ paste is easy to apply, with excellent clinical and radiographic results, even on teeth with an unfavorable prognosis [2-4,15].

It is noteworthy that if the pulp chamber is not cleaned properly and filling material remains, it has a high chance of the tooth crown becoming stained. This is due to the presence of tetracycline in the formulation of the material [2].

The presence of accessory root canals, porosity and permeability in the region of deciduous pulp, would indicate a connection between dental pulp and periodontal tissues. The antibiotic pastes used can easily dissipate in these regions and create a sterile area [6,20]. The elimination of bacteria is essential to guarantee the success of endodontic treatment, especially in primary teeth, where, depending on the physiological root resorption stage, they cannot be prepared and filled [21].

The result of this clinical case is consistent with the results found in the other studies cited. It was a positive result, as the clinical examination showed no painful symptoms, fistula and mobility. The radiographic examination revealed absence of periapical lesion and of the radiolucent area in the furcation region. Another factor that indicates the success of the technique was the eruption of

the permanent successor in biological time and without any sequelae.

Nevertheless, the present study does not allow extrapolations. it acts as an incentive to conduct randomized clinical trials with a long follow-up using the CTZ paste as one of the treatment groups. Such clinical studies will also contribute to conducting systematic reviews that compare LSTR and pulpectomy. the most recently published reviews have failed to disclose any difference between these treatments through the meta-analyses [11,22].

CONCLUSION

This clinical case demonstrated the success of the use of CTZ paste in lesion sterilization and tissue repair of primary molars, until complete eruption of the permanent successor.

Conflict of Interest

The authors declare no conflicts of interest.

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Regulatory Statement

This study was conducted in accordance with all the provisions of the local human subject's oversight committee guidelines and policies. The patient authorized the disclosure of the case and duly signed the informed consent form.

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