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ENDODONTIC TREATMENT OF DECIDUOUS LOWER MOLAR DUE TO AGENESIS OF THE PERMANENT TOOTH GERM

TRATAMENTO ENDODÔNTICO DE MOLAR INFERIOR DECÍDUO DEVIDO À AGENESIA DO GERME DENTÁRIO PERMANENTE

TRATAMIENTO ENDODÓNCICO DE MOLARES INFERIORES DECAIDOS POR AGÉNESIS DEL GERMEN DEL DENTAL PERMANENTE

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ABSTRACT

The objective of this study was to describe the preparation of root canals with a rotary system in a lower molar (85). A 23-year-old female patient was referred to the office of an endodontic specialist for endodontic therapy of her primary lower molar (85). During the clinical examination, he reported pain on vertical percussion and occluso-distal composite resin restoration. Radiographic examination revealed deep restoration close to the distal pulp horn and agenesis of tooth 46. The probable diagnosis was acute apical periodontitis. Exploration of the root canals is carried out with a #10 C-pilot file, based on the apparent length of the tooth.

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Electronic odontometry was performed with the apex locator (Iroot Apex). The preparation of the root canals was carried out with a Prodesign Logic #30.05 file in the three root canals. During the preparation of each canal, 2% Chlorhexidine gel was used to facilitate the action of the nickel-titanium instruments. The filling of the root canals, carried out in the same session with the calibrated MX single cone technique (Tanari) associated with Bio-C Sealer cement (bioceramic cement). Clinical and radiographic follow-up, carried out two years after filling the canals, determined the success of endodontic therapy. It is concluded that the endodontic treatment of deciduous teeth must be carried out in accordance with the technical standards of endodontics, aiming at sanitization, modeling and hermetic filling, determining reabsorption of the bioceramic cement extravasated at the time of filling, which has been proven during 2 years of maintenance. completion of endodontic therapy.

Keywords: Endodontics. Pediatric Dentistry. Canal Preparation. Tooth Agenesis.

RESUMO

O objetivo deste estudo foi o de descrever o preparo dos canais radiculares com um sistema rotatório em um molar inferior (85). Paciente do sexo feminino de 23 foi encaminhada ao consultório de um especialista em endodontia para a terapia endodôntica do molar inferior decíduo (85). No exame clínico referiu dor à percussão vertical e restauração em resina composta ocluso-distal. O exame radiográfico revelou restauração profunda próximo ao corno pulpar distal e agenesia do dente 46. O diagnóstico provável foi de periodontite apical aguda. A exploração dos canais radiculares feita com s lima #10 C-pilot, baseando-se no comprimento aparente do dente. A odontometria eletrônica foi realizada com o localizador apical (Iroot Apex). O preparo dos canais radiculares foi realizado com lima Prodesign Logic #30.05 nos três canais radiculares. Durante o preparo de cada canal foi usado a Clorexidina gel a 2% para facilitar a ação dos instrumentos de níquel-titânio. A obturação dos canais radiculares, realizada na mesma sessão com a técnica do cone único MX (Tanari) calibrado associado ao cimento Bio-C Sealer (cimento biocerâmico). A proservação clínica e radiográfica, realizada após dois anos da obturação dos canais determinou o sucesso da terapia endodôntica. Conclui-se que o tratamento endodôntico de dente decíduo deve ser realizado de acordo com as normas técnicas de endodontia, visando a sanificação, modelação e obturação hermética, determinando reabsorção do cimento biocerâmico extravasado no momento da obturação que foi comprovada na proservação de 2 anos de conclusão da terapia endodôntica.

Palavras chave: Endodontia. Odontopediatria. Preparo do Canal. Agenesia Dentária.

RESUMEN

El objetivo de este estudio fue describir la preparación de conductos radiculares con sistema rotatorio en una molar inferior (85). Una paciente femenina de 23 años fue derivada al consultorio de un especialista en endodoncia para tratamiento endodóntico de su molar inferior primario (85). Durante el examen clínico refirió dolor a la percusión vertical y restauración oclusodistal de resina compuesta. El examen radiográfico reveló una restauración profunda cerca del cuerno pulpar distal y agenesia del diente 46. El diagnóstico probable fue periodontitis apical aguda. La exploración de los conductos radiculares se realiza con una lima C-pilot #10, según la longitud aparente del diente. La odontometría electrónica se realizó con el localizador de ápice (Iroot Apex). La preparación de los conductos radiculares se realizó con una lima Prodesign Logic

#30.05 en los tres conductos radiculares. Durante la preparación de cada conducto se utilizó gel de Clorhexidina al 2% para facilitar la acción de los instrumentos de níquel-titanio. La obturación de los conductos radiculares, se realizó en la misma sesión con la técnica de cono único MX calibrado (Tanari) asociado al cemento Bio-C Sealer (cemento biocerámico). El seguimiento clínico y radiográfico, realizado dos años después de la obturación de los canales, determinó el éxito de la terapia endodóncica. Se concluye que el tratamiento endodóntico de los dientes deciduos debe realizarse de acuerdo con las normas técnicas de endodoncia, visando la higienización, modelado y obturación hermética, determinando la reabsorción del cemento biocerámico extravasado en el momento de la obturación, lo que ha sido comprobado durante 2 años de mantenimiento. finalización de la terapia endodóncica.

Palabras clave: Endodoncia. Odontopediatría. Preparación de Conductos. Agenesia Dentaria.

INTRODUCTION

The literature shows that anxiety and fear are much greater in children compared to young people and adults. Anxiety is characterized by the body's reaction that involves psychological processes and negative family memories, where a feeling of discomfort occurs, caused by tension arising from the anticipation of a feared risk, which may or may not be related to the moment. Pediatric patients tend to feel threatened and afraid (Paiva *et al*., 2019). Endodontic treatment in primary teeth is necessary to maintain the dental element in the mouth, preventing premature loss, occlusal and aesthetic problems. A major challenge is the technical difficulty on the part of professionals during endodontic therapy, knowing the scientific evidence and having experience with the behavioral management approach of patients. However, success in child treatment is still a clinical challenge for dentists. (Jesus *et al*. 2022). The objective of endodontic treatment in deciduous teeth is mainly to preserve the primary dentition, until the exfoliation process occurs, preventing and treating pathologies that affect the dental pulp and its supporting tissues. A complete anamnesis is an essential tool for treatment, as well as the patient's age, systemic diseases, clinical examination, radiography and symptoms, thus contributing to solving the difficulties presented by root canal treatment in deciduous teeth (Moysés *et al*., 2020). The main causes of failure in endodontic treatment are: lack of knowledge of the professional about internal anatomy and its variations, dentists rely on descriptions and diagrams from textbooks about

internal anatomy (Mosqueda, 2021) and also according to the aforementioned author, currently in dentistry, specifically in the area of endodontics in deciduous teeth, there is little literature that talks about root anatomy, thus, these difficulties lead to errors such as unsatisfactory filling of the root canal, perforations, formation of a step, loss of working length and resulting in iatrogenic or negligent attitudes during the procedure.

Therefore, this article describes the endodontic treatment of deciduous lower molars with the use of rotary instruments and apex locator, as well as a filling of the canals with gutta-percha associated with bioceramic cement.

CASE REPORT

A 23-year-old female patient was referred to an endodontic specialist for endodontic therapy of a deciduous lower molar (85). On clinical examination, she reported pain on vertical percussion and occluso distal composite resin restoration. Radiographic examination revealed deep restoration near the distal pulp horn and agenesis of tooth 46 (Figure 1). The probable diagnosis was acute apical periodontitis. Root canal exploration was performed with a #10 C-pilot file, based on the apparent length of the tooth. Electronic odontometry was performed with an apex locator (Iroot Apex). Foraminal patency was achieved with a Prodesign Logic #30.01 file associated with 2% chlorhexidine. Root canal preparation was performed with a Prodesign Logic #30.05 file in all three root canals. During the preparation of each canal, 2% chlorhexidine gel was used to facilitate the action of the nickel-titanium instruments. The root canals were filled in the same session using the calibrated single-cone MX technique (Tanari) associated with Bio-C Sealer (bioceramic cement). (Figure 2). The ProDesign Logic system determined good canal formatting, facilitating irrigation and cleaning of the canals, as well as filling of the root canal system. Clinical and radiographic follow-up, performed two years after the canal filling, determined the success of the endodontic therapy. (Figure 3).

Figure 1, 2 and 3 - Deep restoration close to the distal pulp horn and agenesis of tooth 46 - Root canal filling - Clinical and radiographic preservation.

Source: Authors

DISCUSSION

Whenever faced with challenges in dental care, dentists need to know and correctly analyze the behavior and psychological characteristics of pediatric patients, allowing them to use appropriate non-pharmacological techniques according to the emotional state of each patient, with the purpose of reducing iatrogenic errors due to lack of professional knowledge in behavioral management, and thus obtaining the collaboration of the pediatric patient in the endodontic procedure (Oliveira *et al*., 2020).

The deciduous dentition significantly influences the growth and development of the child, both in terms of general health, providing the correct bases for phonation, feeding, breathing and allowing good body posture, and locally, promoting the maintenance of space for permanent dentition, minimizing parafunctional habits and preventing malocclusions. (Correa, Trindade, 2002). Therefore, the primary objective of pediatric dentistry is to maintain primary teeth in healthy conditions until the genetically determined period for their physiological exfoliation. However, despite the decline in dental caries, many primary teeth are still affected by various processes and traumatic lesions that often require endodontic treatment. (McDonald, Avery, 2011). The extent of the caries lesion also needs to be analyzed so that only a primary tooth capable of being restored should undergo endodontic treatment, given that a well-applied

endodontic technique is of no value if it is impossible to restore the functions of the tooth. (American Academy on Pediatric Dentistry, 2011). In pediatric dentistry, endodontics is most often discarded by the professional, who prioritizes tooth extraction even knowing that pulp therapy in deciduous teeth is considered a more conservative form, considering that the main objectives are to preserve pulp vitality and maintain it in the oral cavity to prevent premature loss, maintaining the space until the permanent teeth can erupt at the exact moment of physiological exfoliation, since this loss occurs outside the correct period, causing functional, aesthetic and even psychological difficulties for these patients (Silva *et al*. 2019). Although there are advanced resources and technologies that can assist in diagnosis and treatment, negative results can occur due to any iatrogenic or negligent attitude of the operator during the procedure (Fatturi *et al*. 2020). Therefore, failure in execution and deficiency in cleaning the root canals – due to their complexity – making it difficult to remove bacteria, microorganisms and necrotic remains, are the factors that most lead to errors in pulpectomy treatment (Carmo *et al*., 2019). However, in addition to the above, the biggest obstacle to the success of endodontic therapy is the difficulty in the behavioral management of pediatric patients; they have a low tolerance to prolonged procedures, which can compromise the chemical-mechanical preparation and adequate sanitation of the root canals (Fernandes *et al*., 2020). Therefore, deciduous teeth must be kept in the mouth, as it is extremely important to maintain the spaces so that the successor tooth can erupt, thus not causing changes in chewing, crowding of teeth, inclination of underlying teeth, and changes in phonetics. In addition, early extraction becomes detrimental to the development of the condylar cartilage and the lower third of the maxillofacial mass. Determining factors that influence clinical decision-making in deciduous teeth are the degree of rhizolysis and the nolla stage of the permanent tooth. With this information, the dentist must choose whether to preserve the deciduous teeth or perform tooth extraction (Bollete *et al*., 2016).

The diagnosis of the pulp condition is the main factor to be considered when choosing the treatment. This diagnosis is obtained through an accurate clinical examination associated with radiographic examination, the latter consisting of interproximal and occlusal radiographs modified for the anterior teeth. (Guedes-Pinto, Bonecker, Rodrigues, 2010). Complementation with a periapical radiograph may be necessary to confirm the diagnosis, as it allows better visualization of the deciduous tooth and its successor. (Toledo, 2012).

Although deciduous teeth have different characteristics than their successors, pulp therapy in these teeth is often based on that performed on permanent teeth. After the discovery of the

endodontic Smear Layer, several studies have evaluated the irrigating solutions and filling materials commonly used. Unfortunately, this fact does not receive due importance from Pediatric Dentistry. Therefore, this paper reviews the literature on irrigating solutions and filling materials obtained The most commonly used instruments in the endodontic treatment of deciduous teeth in relation to the Smear Layer and adaptation of the filling pastes (Cunha, Barceloss, R. Primo, 2005).

The correct execution of the coronal access, conical modeling, instrumentation and disinfection of the root canals, cleaning, insertion of inert material, in order to maintain their original trajectory, allow the correct obturation of the canal, the dentist must observe the internal anatomy and its complex characteristics, following a protocol and principles aimed at minimizing possible errors that occur due to the professional's lack of skill, obtained by negative results, iatrogenic or negligent attitude during the procedure (Moreti *et al*., 2019). Therefore, the instrumentation of the root canal becomes difficult for the operator when there is no knowledge of the internal anatomy of the root canals, as a result of which several accidents occur; such as technical failures, complications in the instrumentation of atretic and curved canals, failure to use aggressive instruments, perforation of the root canal and fracture of the instrument within the canal (Khanna *et al*., 2017). Also in this study, the apex locator was used to determine the correct working length because Endodontic therapy consists of several interdependent steps. The standard used to determine the working length of the canal is the radiographic examination, which in many cases is difficult to obtain due to limited access to the pediatric patient's mouth and their behavior. Radiography is an extremely important complementary examination to confirm the endodontic diagnosis, and correct apical patent will ensure the obturation of the canal in a hermetic and three-dimensional manner, ensuring that it is properly filled and avoiding damage to the periradicular tissues and the permanent germ. However, the radiographic examination has limitations such as: distortion of overlapping roots, structures associated with the permanent germ, as well as exposing the patient to radiation and low tolerance to the procedure and making treatment difficult. Therefore, apex locators, associated with the initial radiographic examination, have been a promising choice for determining the length of the canals, not only in permanent dentition, but also in deciduous elements (BRUM *et al*., 2020). In the present case, there was no concern about the permanent tooth germ that was absent. Furthermore, for endodontic therapy to be successful, it depends on several factors, ranging from adequate sanitation of the root canals to the choice of filling material. Among these factors, the importance of choosing the endodontic

filling material cannot be overlooked, since an ideal endodontic filling material for deciduous teeth must meet the basic requirements such as: biocompatibility with periradicular tissues, antimicrobial characteristics and physicochemical properties, including radiopacity, flow, slow resorption and harmlessness to the developing permanent tooth germ, as it is very close to the tooth root. Therefore, endodontic treatment must have the correct indication and be performed in a way that does not damage the permanent germ (Pilownic *et al*., 2017). In the present case, there was no concern about reabsorption of the material, which is why gutta-percha was used in association with Bio-C Sealer.

CONCLUSION

Endodontic treatment of deciduous teeth must be carried out in accordance with endodontic technical standards, aiming at sanitation, modeling and hermetic obturation, provided that the dental surgeon knows how to correctly analyze the behavior and psychological characteristics of child patients.

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