

ENDODONTIC TREATMENT OF LOWER PRE-MOLAR WITH RADICULAR DILACERATION - CASE REPORT

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ABSTRACT

This study aims to present a clinical case of a second lower left premolar with marked dilaceration. The patient complained of "pain when drinking cold water" and when chewing. Clinical examination revealed extensive restoration of composite resin on the occlusal and distal surfaces. At the radiographic examination, an image of extensive and in-depth coronary restoration was perceived, suggesting proximity to the pulp chamber, besides a sharp apical dilaceration of the root. However, no periapical lesion was found. The pulp diagnosis for this case was irreversible pulpitis. The chemical-mechanical preparation was performed with the 25.05 file of the ProDesign Logic system (Easy Equipments, Belo Horizonte, MG, Brazil), followed by irrigation with 5.25% sodium hypochlorite solution. At the end of the chemical-mechanical preparation, the Easyclean file was used in a reciprocating motion at the working length (WL) for 20s. The obturation was performed using a gutta-percha FM EL cone (Odous de Deus, Belo Horizonte, MG, Brazil) using the continuous condensation wave technique.

KEYWORDS: Endodontics, root canal therapy, root dilaceration.

1. INTRODUCTION

Mechanical disinfection is a significant step in bio-film removal and decontamination of the root canal system. Currently, nickel-titanium (NiTi) instruments allow greater predictability of endodontic treatment with a lower risk of promoting deviations¹. However, pronounced root curvatures can be considered difficult obstacles to be overcome depending on the degree of deformity and root formation^{2,3}.

NiTi instruments, unlike those of stainless steel, are able to maintain the root canal format more satisfactorily and reduce the preparation time⁴. Recently, through thermomechanical processing that ensures control of shape memory, the NiTi alloy gained extreme flexibility⁵.

Thus, the mechanical preparation becomes more centralized and contributes to maintain the original anatomy of the root canal¹, reducing the risk of unwanted accidents, such as: apical transport, steps and perforations frequently found in root canals with marked curvature⁶.

In addition, factors such as the radius of curvature of

the canal, flexibility and diameter of the endodontic instrument, technique of instrumentation and type of movement employed can influence the final result of the instrumentation of a curved canal. Such variables may directly affect the prognosis, since the domain of the internal anatomy plays a fundamental role in the success of endodontic treatment⁶.

The chemical cleaning in canals with anatomical difficulties is an important aid in the disinfection process. The presence of debris adhered to the root canal walls after mechanical instrumentation may lead to failures in the sanitization process^{7,8}. Thus, alternatives such as the mechanical agitation of the auxiliary chemical solution is an important alternative to potentiate the disinfection of the root canal system and debris removal⁹.

The aim of this Case Report was to describe the endodontic treatment of a second lower premolar with marked root curvature, focusing on conservatism and greater predictability about the proposed treatment.

2. CASE REPORT

A 61-year-old male patient was referred for endodontic assessment of the lower left second premolar, complaining of "cold pain" and chewing. During anamnesis, no systemic alteration was reported.

During intraoral examination, extensive resin restoration was observed composed of said dental unit (occlusal and distal surfaces). A cold sensitivity test (Roeko GmbH & Co., Langenau, Germany) was performed, with a positive result, with an exacerbation of pain even after removal of the stimulus. In addition, there was a negative response to the percussion and palpation tests. Also, no dental mobility or periodontal pocket.

The periapical radiographic examination revealed an image of extensive and deep coronary restoration suggesting proximity to the pulp chamber. It was also observed a sharp apical dilaceration of the root, developmental anomaly characterized by an abrupt alteration in the axial inclination of this one. However, no periapical lesion was found. The pulp diagnosis for this case was irreversible pulpitis (Figure 1-A).

To perform the endodontic treatment, the mental nerve was anesthetized using local anesthetic lidocaine 1: 100,000 (Alphacaine 100, DFL, Rio de Janeiro, Brazil) followed by absolute isolation of the dental unit. The apparent length of the tooth, measured on the periapical

radiograph through the software (Carestream Kodak RVG 6100, Rochester, New York, USA) was 26mm. The access to the pulp chamber was conducted with a high-speed diamond spherical drill bit 1012 (KG Sorensen, São Paulo, SP, Brazil) under constant cooling. After the canal entrance with a straight exploratory probe, the exploration of the canal with c-pilot # 08 and # 10 files (VDW GmbH, Munich, Germany) was continued until root curvature.

After manual glidepath, mechanical patency was performed using the 25 / .01 file of the ProDesign Logic system (Easy Dental Equipments, Belo Horizonte, MG, Brazil), passing 1mm beyond the foramen to allow greater safety during the posterior modeling of the canal. The actual working length (WL) was determined to be 26mm between the tip of the buccal cusp of the same tooth and the apical foramen. For this, an electronic apical locator (Root ZX II, JMorita Co, Tokyo, Japan) was used and later confirmed radiographically (Figure 1-B).

The chemical-mechanical preparation was performed using the 25 / .05 file of the ProDesign Logic system, which has the following characteristics: Continuously rotated, nickel-titanium alloy (NiTi) with Control Memory (CM) heat treatment, modified section S-shaped and inactive tip. Smooth vertical penetration (in / out) movements were performed with amplitudes of 2 to 3mm up to the working length of 26mm. Sodium hypochlorite (NaOCl) 5.25% (A Therapeutics, Guaçuí, ES, Brazil) with hypodermic syringe (BD Plastipak, Curitiba, Paraná, Brazil) and Navitip 30-G needle (Ultradent, South Jordan, Utah, USA).

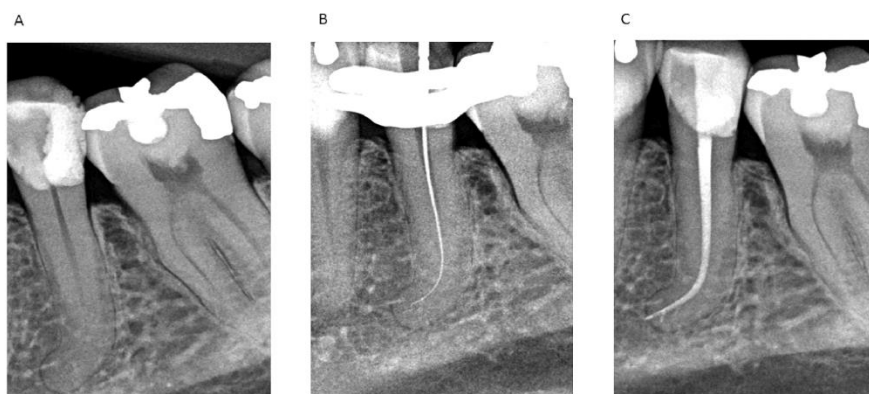
At the end of the chemical mechanical preparation, the final irrigation was performed according to the following protocol: the canal was flooded with 5.25% sodium hypochlorite and EasyClean file (Easy Equipamentos Odontológicos, Belo Horizonte, MG, Brazil) in reciprocating motion at the actual working length (WT) for 20s; aspiration with Capillary tip cannula (Ultradent, South Jordan, Utah, USA), root canal filling with 17% EDTA (A Therapeutics, Guaçuí, ES, Brazil) and activation of Easyclean in the WT for 20s; aspiration with Capillary tip cannula and, once again, root canal filling with 5.25% sodium hypochlorite followed by re-activation of Easyclean in the CT for 20s.

At the end, the canal was dried with a Capillary tip aspiration cannula and sterile absorbent paper cones (MKLife, Porto Alegre, Rio Grande do Sul, Brazil), and the obturation was performed with the FM EL gutta-percha cone (Odous de Deus, Belo Horizonte, MG, Brazil) and AHPlus cement (Dentsply Maillefer, Ballaigues, Switzerland) by the continuous-wave condensation technique (Figure 1-C).

The pulp chamber was then cleaned with absolute alcohol soaked in cotton pellets to remove excess cement. The filling core was made with SDR fluid composite

resin (Dentsply, Milford, USA) and the patient was sent to perform the final restoration.

Figure 1. A) Initial radiograph of dental element # 35, showing a marked curvature of the root; B) Radiological odontometry C) Final



radiograph of dental element # 35, showing that the original canal trajectory was respected after endodontic treatment.

3.DISCUSSION

The superelasticity of the NiTi alloy together with the CM thermal treatment are ideal for the preparation of root canals with a pronounced curvature because they are more resistant to cyclic fatigue and allow more uniform preparation, less risk of carriage of the canal and^{10,11} lower risk of flexural fracture¹²⁻¹⁵. In addition, less tapered instruments cause less canal transport when compared with instruments with larger conicity, this is a predetermining factor in the ability to form deviations in curved canals¹⁶. Such information demonstrates the importance of choosing the liming system to be used and corroborates with the endodontic treatment performed.

Due to the limitations of Passive Ultrasonic Irrigation (PUI) in cases of sharp curvature, since its action is restricted to the straight portion of the root canal, EasyClean file was chosen for better chemical disinfection. The file has dimensions 25 / .04, design in the form of "wing of airplane" and its material of manufacture is plastic. For such characteristics, the instrument can be used in the WT to agitate the chemical auxiliary solution and contribute to the removal of debris generated during instrumentation without the risk of deforming the internal walls of the root canal, forming steps or promoting trajectory deviations original⁹.

Sodium hypochlorite is the most commonly used auxiliary chemical for chemical disinfection of the root canal system¹⁷⁻¹⁹. Because it is an organic solvent, it gives excellent antibacterial efficacy²⁰. Although its concentration variation is not yet directly related to the increase of the antibacterial power, the volume of NaOCl is extremely important to obtain a better disinfection²¹.

Moreira *et al.* (2017)²², reported that treatments in single or multiple visits show similar healing and success rates, regardless of the condition of the pulp and periapice. In addition, patients with apical periodontitis

demonstrated an incidence of minor postoperative complications in treatments performed in a single session.

4.CONCLUSION

Accentuated curves can be considered anatomical complexities challenging against endodontic treatment. The evaluation of the clinical signs and the study of the imaging for the correct planning about the decisions to be made is of fundamental importance for the correct handling of complex cases.

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