

STUDY ON ENDO-PERIODONTAL INTERRELATIONS IN CASE OF MOLARS WITH CHRONIC FURCATION LESIONS AND PROSTHETICAL TREATMENT

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ABSTRACT

In practice, there are clinical situations that make diagnosis difficult, particularly in case of endo-periodontal lesions with destructive effect at the furcal level. Sometimes these situations may lead to an incorrect therapeutic approach, the main objective in the treatment of endo-periodontal lesions being the stopping of the inflammatory process and the subsequent loss of the periodontal attachment. The aim of this study was to determine the influence of endodontic diseases on the periodontal tissues of furcal area and the rate of recovery in time after the treatment of radicular perforation which produced chronic injury, using reparative materials. Materials and method: The clinico-radiological study was carried out on a group of 24 molars with chronic furcal lesions. In both cases where the lesion was already present and where it was involuntarily performed, it was attempted to stimulate the restoration of the affected tissue by applying repairing biomaterials, seal the root canals and apply a coronal restoration. Results and Discussions: Based on the results of this study, MTA is required as an excellent material for perforation repair, and calcium hydroxide sealants have great advantages in regenerating periradicular bone tissue and the furcal area. Subsequent to endodontic therapy, in most cases, a prosthetic restoration of the treated tooth was made by applying a post and crown. Conclusions: In the case of the teeth included in this study, the effectiveness of medication based on calcium hydroxide and of the sealants with biostimulating properties was supported by the complete healing of the affected tissues.

Keywords: furcal lesions, biostimulating materials, prosthetic restoration

INTRODUCTION

Between the endodontic and the periodontal tissues there is a close interdependence, the affection of one being able to determine a response from the other, the two tissues constituting a functional unit. The resorptive processes at marginal periodontal level and the therapeutic measures used in the treatment of periodontal disorders establish another way of communication with the dental pulp, these interactions giving the clinician

a hard time in detecting the direct cause of the periodontal disease [1].

The treatment plan and prognosis depend mainly on the diagnosis of endodontic or periodontal disease [2],[3]. The main factors to consider are the pulp vitality and the extension of the periodontal defect.

In both cases where the lesion was already present and in which it was performed involuntarily, intraoperatively, the stimulation of the damaged periradicular tissue was tried by applying repair biomaterials, sealing the root canals and

coronal restoration, with the functional rehabilitation of the tooth on the arch.

MATERIALS AND METHOD

The present study was performed on 24 molars (8 maxillary and 16 mandibular), from 24 patients (14 men and 10 women), aged between 21-46 years, who were presented in the Clinical Education Base of Faculties of Dental Medicine for treatment.

Patients presented either in view to perform a root canal treatment as a result of a symptomatology present at that tooth, or as a result of iatrogenic maneuvers performed in the past. In all these cases, the patients were informed about the condition of the involved teeth and were explained the possibility of repairing the defect that appeared, with the help of repair biomaterials, destined for this purpose. All patients agreed to accept this treatment solution.

The criteria for inclusion in the study were: molars with endo-periodontal lesions complicated with furcal resorbition, permanent molars with perforations on the floor of the pulp chamber of small size, with a diameter between 1-3 mm, with or without previous endodontic

treatments. Exclusion criteria were: subgingival coronary margins, 3-rd degree dental mobility.

Preoperatively, periapical radiographs were performed on all the teeth studied, for the radiological analysis of the endodontic and periradicular status. Pre-treatment, immediate post-treatment and at least 3 months postoperatively were evaluated to determine the presence or absence of pathological changes adjacent to the perforation area.

Following the radiological elements, our examination appreciated: the trabeculations of the spongy bone at the level of the interdental septum, the image of the compact bone following the contour of the PDL, the furcal area and its possible damage; the appearance of the apical area in the case of endo-periodontal lesions.

The patients were divided into two groups (Fig. 1) according to the etiology of the furcal lesion, in the first group being 18 molars with chronic furcal lesions appeared as a result of the evolution of an endo-periodontal lesion, and the second group has 6 molars with furcal lesions following perforation in the interradicular area.

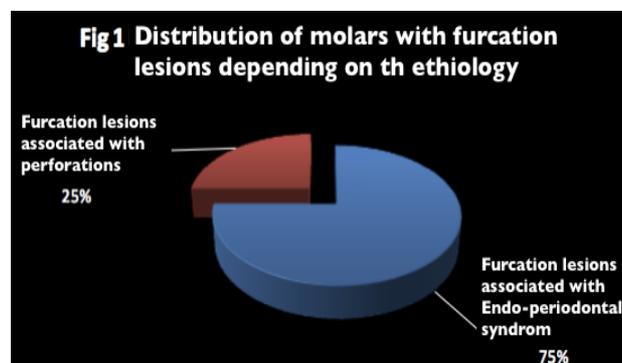


Fig 1. The distribution of cases with furcation lesions.

In the case of the group with chronic furcal lesions that appeared as a result of the evolution of an endo-periodontal disease, the cases were divided according to the primary etiology of the lesion (fig. 2). Thus, after the clinical-radiological evaluation of the cases included in the study and the correct diagnosis of the primary endodontic

pathology, or periodontal pathology, the first group was divided into a group consisting of lesions associated with endodontic disorders (10 teeth), another formed of teeth with lesions associated with chronic periodontal disorders (6 teeth), and the last one consists of teeth presenting with furcal lesions associated with true endo-periodontal injury (2 teeth).

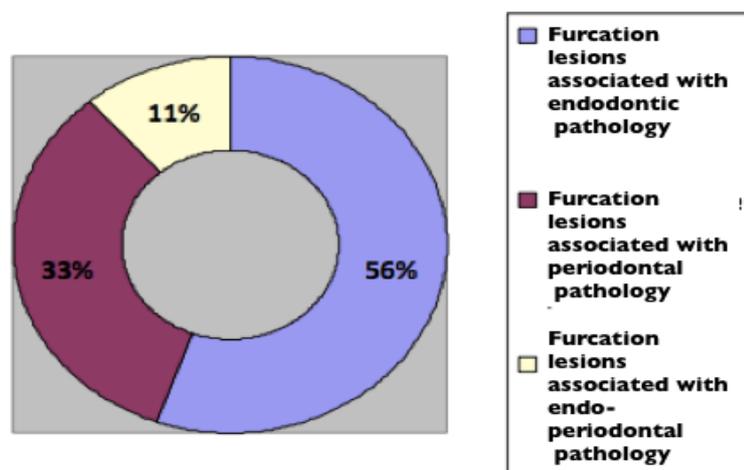


Fig. 2. Representation of cases with furcation lesions associated with the evolution of endo-periodontal pathology according to the primary etiology.

After the isolation, debridement and disinfection of the cavity, the access to the root canals was made, and in the cases in which the bleeding was present, hemostasis was performed using 5% sodium hypochlorite soaked cotton pellets.

In the case of teeth with radicular perforations, the area of communication between the endodontic and periodontal space was exposed and the stage of defect reparation was carried out by applying the MTA, transported with a special instrument - MTA gun and by compacting it gently with the plugger. In each case, a moisture cotton pellet was applied over the cement, and in the end a temporary coronal

filling (Citodur, DoriDent, Austria) was applied for 2-3 days. In the next session, the provisional material was removed, the MTA hardness was verified by probing with the probe and the degree of perforation coverage was checked. Then, the classical, chemo-mechanical treatment and medication of the root canals were performed.

A crown-down canal preparation technique was used, using manual and rotary instrumentation (ProTaper Next, Densply), as well as alternative irrigation with 5% sodium hypochlorite and 17% EDTA solution. As a medication, calcium hydroxide paste (Calxyd, SpofaDental),

replaced every other week for 2-4 weeks, depending on the clinical situation. After the drug treatment, we sealed the channels with calcium hydroxide sealant (Sealapex, Kerr) and gutta-percha cones, using the single tapered cone technique. Finally, a glassionomer cement (Kavitan Plus, SpofaDental) was applied as a base, and over it a composite seal, for a tight a coronal seal. Where the lack of dental substance was high, post and crowns were subsequently applied. The patients studied were monitored and evaluated with the help of radiological examinations at intervals of 3, 6 and 12 months.

RESULTS

After conducting the clinical examination, anamnesis and the interpretation of radiological images, we concluded that of the 24 teeth studied, 6 were presented with pre-existing perforations, made more time ago and with associated chronic periapical pathology, untreated; 2 had at the time of presenting a history of treatment of these lesions, but incorrectly performed and inefficient, with the persistence of the interradicular radiotransparency, and 18 cases were chronic furcation lesions that appeared following the evolution of endo-periodontal pathology (10 with primary endodontic etiology, 6 showed primary periodontal etiology and 2 were associated with a true endo-periodontal lesion).

Of the total patients analysed, all the molars taken in the study had on the initial X-ray an interradicular radiotransparency, which confirms the presence of a chronic inflammation in the area of the fork, accompanied by painful symptoms.

The initial radiological clinical situation is similar for both types of teeth, both lower molars as well as upper molars, as well as for both types of furcation lesions.

At the radiological examination carried out after 3 months from the permanent root obturation, we found: in group 1 (GR.1), out of the 18 molars presenting with chronic furcation lesions by association with endo-periodontal disorders, 16 showed radiological obvious signs of bone restoration, after the endodontic or combined endodontic therapy was instituted. and periodontal.

At the clinical-radiological evaluation after 6 months, we found: at GR.1, a visible bone healing, with the absence of clinical symptoms and fistula. At GR.2, the decrease of the area of osteolysis, with the complete resolution of perforation and the absence of both clinical symptomatology and fistula.

At 1 year postoperatively, all of the molars in GR.1 were asymptomatic, had no attachment loss or fistula. However, the radiological examination revealed, in 3 of the cases, the persistence of a radiotransparency in the furcal space, at the molars with larger initial lesions. At the molars in GR. 2, the same situation, with the mention that here only one case, all of those with bigger perforation area, presented a slightly reduced osteolysis image compared to the initial one and slight discomfort in the mastication.

DISCUSSIONS

The main objective in the treatment of endo-periodontal lesions complicated with chronic fork lesions is to stop the inflammatory process and the subsequent loss of periodontal attachment by

preserving healthy tissues [4],[5]. If the lesion is already present, it is important to restore the tissue re-attachment.

Based on the results of the cases presented in this study, the MTA is required as an excellent material for perforation repair [6], and calcium hydroxide sealants have great advantages in regenerating periradicular bone tissue [7],[8].

To illustrate the ability of the aforementioned materials for recovery and healing of periradicular affected areas, we will describe some clinical cases solved within this study.

The first case (Fig. 3) is represented by a 27-year-old patient, who presents with

a slight discomfort in mastication on the tooth 4.7. The vitality tests were negative, no periodontal pockets. After the diagnosis of complicated gangrene with the interradicular bone lysis (endodontic primary etiology), the endodontic treatment was instituted. After removal of the coronary obstruction, an attempt was made to puncture the root canals by accidentally perforating the distal wall of the medial root 1.5-2 mm between the pulp chamber and the interradicular periodontium, which bleed on probing with the probe. Radiological examination revealed a wide area of radiotransparency at the interradicular level, which implies the presence of a local irritation factor.



Fig. 3 Initial X-ray of tooth 4.7



Fig. 4 Postoperative X-ray of tooth 4.7

The remaining coronal obturation was removed, the endodontic space was rinsed with 5% sodium hypochlorite and 17% EDTA. Endodontic space was shaped with manual and rotary instrumentation, dried and applied a calcium hydroxide medication for one week. A waiting period was required to disinfect the endodontic space and provide hemostasis in the perforation area. After one week, calcium hydroxide was removed, a gray MTA layer

was applied to seal the communication pathway to the periodontium. After 2 days the endodontic seal was permanently applied and a control X-ray was performed (Fig. 4).

At the radiographic evaluation at 3 months postoperatively, a partial restoration of the interradicular bone trabeculation can be observed. And at the evaluation after 6 months, the radiography shows the new bone structure in the region

of the interradicular septum and adjacent to the MTA (fig. 5).



Fig. 5 Six month postoperative X-ray

The following case presents a special clinical-radiological situation, due to the 21-year-old patient, presented to the clinic for the resolution of carious lesions. Following radiological examination, it was found that not all teeth in the lateral groups had closed apices. From the anamnesis, it was suspected as a factor favoring this situation, the superposition of an ingestion of the caustic substance over the period when the apexification of the roots of the lateral teeth occurred. In the case of tooth 3.6, which had a deep carious lesion, on the radiograph we could see an extended radiotransparency from the mesial root to the furcal area, the tooth was nonvital.

The endodontic treatment was started, by creating the access cavity the chemo-mechanical debridement of the root canals and their irrigation with 5% sodium hypochlorite and 17% EDTA. After the first treatment session, the patient suffered

an acute exacerbation of the chronic periradicular lesion, with drainage of the pus through the sulcus, which led to the combination of the endodontic treatment with a periodontal drainage (kept open by the sulcus with a guttapercha cone) and irrigation (irrigation with antiseptic solutions, CHX 2%). After canal preparation, drug treatment with iodoformed calcium hydroxide was applied for 2 months with its change at 2 weeks. After this period the root obturation was performed, which unfortunately, at the level of the mesial root shows an overfilling with guttapercha cone. Even in these conditions, at the radiographic control at 3 months, a reduction of the interradicular lesion was observed, as well as the closure of the apex at the level of the distal root and partially on the mesial root (fig. 6,7)



Fig. 6 Initial X-ray of tooth 3.6



Fig.7 Control X-ray 3 months postoperatively

CONCLUSIONS:

Because the success of an endodontic treatment depends on a whole host of factors that the practitioner may or may not encounter during the course of the pulp treatment and the preparation and sealing of the endodontic space, it must use effective disinfectants and ultimately its

choose the best performing materials for closing or sealing this space as tightly as possible. In the case of the teeth included in this study, the effectiveness of the calcium hydroxide medication was demonstrated by the use of intracanal calcium hydroxide medication as well as the sealants with biostimulating potential.

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