

# Single and multiple session endodontic treatment of teeth with periapical diseases: a case report

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## Abstract

This case report aimed to compare the quality of the apical repair obtained in teeth with visible periapical lesions on radiography, treated either in single or in multiple sessions. The treatment was administered to a patient bearer of chronic periapical lesions in the apices of teeth 41, 31 and 32. Teeth 41 and 32 received endodontic treatment in a single session, whereas 31 received Calen, an intracanal medication, for a fortnight before the final filling. Preservation x rays were then taken. The patient returned for the last time, 1 year and 4 months after completion of treatment. He was asymptomatic and the complete remission of radiotransparent images in the apices of the teeth treated was observed, suggesting clinical and radiographic success of the endodontic treatment reported.

## INTRODUCTION

Endodontics has been submitted to the most varied concepts and philosophies which characterize different stages of its development. Despite significant advances, many aspects and procedures in endodontics are still in discussion among the professionals, demanding a larger amount of research to be settled (1). The endodontic treatment of teeth with periapical lesion in a single session is one of such controversial themes.

The success of the endodontic treatment is directly related to the control of the endodontic infection. In the situations of pulp vitality, the endodontic treatment in a single session is ideal if there is time for the accomplishment of the procedure. This treatment modality is based on the fact that the canal is free from bacteria. Since the aseptic chain has been maintained by the professional, there is no reason for not finishing the procedure in the same session (2).

In the case of necrotized teeth with visible periapical lesions on a radiograph, the biomechanical preparation and the immediate filling of the root canal raise doubts over the quality of the canal sanitation due to the diffuse nature of the infection through the isthmuses, dentinal tubules, secondary and accessory canals, apical cementoclasts and spots of apical cementary reabsorption (3;4;5). Possibly, some reports of refractory periapical lesions or many cases of partially repaired radiotransparent areas are consequences of such remaining infection. Soares and Cesar (2001) (6) have

assessed the incidence of postoperative pain and periapical repair, following the endodontic treatment in a single session in patient bearers of necrotized pulp associated with radiotransparent periapical lesions. After a twelve-month period, the endodontic treatment in a single session proved to be clinically successful in one hundred per cent of the cases, but radiographic success lagged far behind.

However, the endodontic literature reports cases of treatment of teeth with necrotized pulp and periapical diseases in a single session and sometimes within a relatively short period (7;8;9;10;11), which had a good outcome. For example, Soares et al. (2005) (12) presented two clinical cases of teeth presenting with great periapical chronic lesions which were treated in a single session with clinical and radiographic success. Some authors have claimed that the success of the treatment is based on the proper use of the irrigant, on the professional's anatomical knowledge, and mainly, on the technical ability of such professional in carrying out an effective biomechanical instrumentation and a suitable three-dimensional filling.

Therefore, the aim of this case report is to show an interesting case focusing on the discussion of the quality of periapical repair in endodontic treatment performed in single and multiple sessions.

## CASE REPORT

The patient, a Caucasian female, 20 years old, came to the

dental public health service provided by the municipality of Limoeiro, Pernambuco, Brazil with a complaint of intense pain to vertical percussion in teeth 41, 31, and 32. The teeth had been restored for nearly 10 years prior to the date of the beginning of the treatment. Following the radiographic examination, periapical lesions were detected around the apexes of the teeth reported. Endodontic treatment was then indicated.

After dental prophylaxis and procedures for local anesthesia, the crown openings were drilled. All the teeth were isolated with rubber dam and instrumented by the Modified Oregon Technique.

After odontometry, the cervical and medium third preparation took place with Gates Glidden drills (Ballaigues, Switzerland, Maillefer) numbers 4, 3 and 2, consecutively. The thinner the drill, the deeper it went into the root canal. Care was taken so that the performance of such drills occurred 4mm before the limit of the Working Length (CT). Afterwards, there followed the apical preparation and determination of the master instrument with K flexofile (Ballaigues, Switzerland, Dentsply Maillefer). After the determination of the master instrument, the first 4 files of consecutive tapers were used with anatomical penetration, the master instrument taking turns with each consecutive K file. All the root canals were irrigated and aspirated using 2.5% sodium hypochlorite (Recife, Brazil, Roval Pharmacy) as irrigating solution. The cleaning of the apical foramen was not accomplished in none of the teeth.

The teeth were filled in the first session; right after the biomechanical preparation was accomplished. The canals were dried with absorbent paper tips (Ballaigues, Switzerland, Dentsply Maillefer) and filled with main and accessory gutta percha points (Ballaigues, Switzerland, Dentsply Maillefer) mixed with Endofill sealer (Petrópolis, Brazil, Dentsply) by the Lateral Compaction technique. Finally, the teeth were definitively restored with Spectrum TPH resin (Ballaigues, Switzerland Dentsply Maillefer).

Tooth 31 received calcium hydroxide Calen (Rio de Janeiro, Brazil, SSWhite) as intracanal medication after the biomechanical preparation. The tooth was then sealed with glass ionomer Vitrebond (St. Paul, Minnesota, USA, 3M) for a period of 15 days before the final filling. When this period elapsed, tooth 31 was filled according to the same technique used in teeth 41 and 32. Finally, tooth 31 was also restored with Spectrum TPH resin (Ballaigues, Switzerland, Dentsply Maillefer) as definitive restoring material. A final filling x

ray of teeth 41, 31 and 32 can be observed on Figure 1.

**Figure 1**

Figure 1: Final filling x ray of teeth 41, 31 and 32



The patient was instructed to return for preservation radiographic exams, first, within 3 months; then, within 1 year, and finally, after 1 year and 4 months after the completion of the endodontic treatment. All the x rays of this study were made in a standardized way with a 70Kvp and 10 mA, with the same exposure time (0,5s), E - Speed periapical films (New York, USA, Kodak), same processing solutions (New York, USA, Kodak) and same processing time (2 minutes for revelation, intermediate bath with water, 4 minutes for fixation, final wash with running water; being the radiographic films dried in open air). The radiographic exams were accomplished with the aid of a radiographic positioner (São Paulo, SP, Brazil, JON).

## RESULTS

Three months after the completion of the endodontic treatment, the patient returned to the dental service for preservation x ray. In the occasion, teeth 41, 31, and 32 did not show any clinical symptomatology suggestive of periapical inflammation. However, the radiographic exam

still revealed radiotransparent images located in the apices of the teeth mentioned (Figure 2)

**Figure 2**

Figure 2: 3 months preservation x ray



**Figure 3**

Figure 3: 1 year preservation x ray



Nevertheless, after 1 year, a new radiography was taken and remission of the radiotransparent images was complete. The patient was also completely asymptomatic (Figure 3). These clinical and radiographic conditions remained constant in the x ray taken 1 year and 4 months following the completion of the endodontic treatment (Figure 4), suggesting that the treatment chosen whether in a single session or in multiple sessions had been successful.

**Figure 4**

Figure 4: 1 year and 4 months preservation x ray



## DISCUSSION

The endodontic treatment consists of the complete cleaning and modeling of the root canals, not allowing partially instrumented spaces, particularly in cases of periapical pathology. In infectious processes of long duration, bacteria can spread into ramifications, reentrances, isthmuses, apical deltas and dentinal tubules. Located in such areas, these microorganisms cannot be removed during the chemical - mechanical preparation. The intracanal medication remains longer inside the root canal system, being able to act in sites not reached by the endodontic instruments or by the irrigating solution. Thus, it enhances the bacterial reduction as well as the repair of the periapical tissues (13).

However, in the last few years, great technological advances made the operative stages more simple, allowing the endodontic treatment of teeth with periapical lesions to be performed in one single session (14).

The present case report showed complete repair of the periapical lesions in teeth 32 and 41 (treated in one session) and in tooth 31 (treated in two sessions with Calen as an intracanal curative). Such results confirm that the endodontic

treatment in a single session can be used in teeth with periapical lesions. Corroborating the results of this work, Oliet (1983) (9) claimed that no matter the pathological condition of the pulp or periapical region, the treatment of teeth with periapical lesions in one single session is viable whenever the preconditions required have been satisfied (canals conically modeled and free of exudation, absence of symptoms and availability of time).

Variables which are not controlled such as the patient's immunological condition or the ability of the operator exert some influence on the success of the endodontic treatment (1). In this work, such variables were kept under control. The treatments were performed by the same professional and in the same individual, which means teeth with similar periapical reactions and subject to the same immunological defense system.

The maintenance of an aseptic chain during the endodontic treatment, the appropriate modeling of the canal root to allow its satisfactory irrigation with antiseptic solutions is more important than performing treatments in one single session or in multiple ones as for what concerns the periapical lesion repair (15). In the present case, the teeth were kept in absolute isolation (rubber dam) during the whole treatment, a previous dental prophylaxis was administered and techniques and materials consecrated by research were used.

During the biomechanical preparation, the Modified Oregon technique was used. This technique promotes appropriate modeling, and is extremely effective for the removal of the toxic content inside the root canal. Moreover, it is also believed to be superior to the rotatory techniques (16; 17). In this study the cleaning of the apical foramen was not accomplished in none of the teeth. We agree with Guimarães (2005) (1) who said that the cleaning of the apical foramen is not an indispensable procedure for the repair of the periapical lesions. With a sample of 980 teeth with periapical lesions, visible on radiography, Guimarães (2005) (1) submitted 59% of the sample to the cleaning of the foramen while the 41% left received no such cleaning. The results showed no significant differences between the groups, concerning the repair of the periapical lesions.

During the filling of the root canals, care must be taken regarding the cytotoxicity of the endodontic sealer because this material easily invades the periapical tissues, causing inflammation and thus harming the healing process. In the present study, Endofill was used because of its low

citotoxicity when compared with Polifil, Sealapex (18) and Sealer 26 (19) and also because of its larger antimicrobial activity when compared to AH Plus and Sealer 26 (20).

In tooth 31, Calen was used as the intracanal medication. Based on calcium hydroxide, it is biocompatible, has anti-inflammatory and antimicrobial actions, stimulates the formation of mineralized bony tissue and contributes to the healing process. All of such qualities are due to its high pH, favored by the dissociation of calcium and hydroxyl ions (21).

This case report showed that the endodontic treatment of pulpless teeth, with the presence of periapical reactions is viable in one single session. Results obtained are similar to those of teeth treated in multiple sessions with intracanal medication, since some basic principles such as the maintenance of the aseptic chain, absolute isolation and mostly, proper irrigating solutions associated with instrumentation and filling techniques are respected. Above all, each single step of the endodontic treatment should be faced as a requirement for the next one.

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