Case Report Article

Intraradicular post and core removal followed by endodontic retreatment: thirteen-year follow-up

Susiane Allgayer
José Roberto Vanni

Corresponding author:
Susiane Allgayer
801/205, Bento Gonçalves St.– Dowtown
ZIP code 95900 000 – Lajeado – RS
E-mails: susianeallgayer@gmail.com / susianeallgayer@ibest.com.br

1 School of Dentistry, Meridional Center of Dental Studies – Passo Fundo – RS – Brazil

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Abstract

Introduction: Endodontic retreatment, when properly indicated, allows the maintenance of dental elements. The evolution of endodontic techniques and materials has reduced the indication of surgical procedures even for teeth with intracanal posts. Case study: A 31 year-old patient related pain in tooth #12. After radiographic examination, the presence of a periapical lesion in teeth #12, #11, and #21 was found, which had already undergone to paraendodontic surgery and placement of intraradicular post and core. Treatment comprises the removal of the intracanal post and core, and the respective root canals were endodontically treated. Conclusion: The technique here exemplified, intracanal post removal and retreatment, proved to be well indicated and effective, since, at the 13-year follow-up appointment, the teeth remained without clinical and radiographic findings.

Keywords: periapical abscess; oral surgery; retreatment.

Introduction

In current endodontic practice, the science of diagnosis constitutes the fundamental basis for the therapeutic institution and consequently for treatment indication. The clinical diagnosis of pulp and periapical pathologic alterations based on the knowledge, semiological and radiographic examinations, and, mainly on the professional’s clinical experience will allow an effective planning of the procedure enabling, therefore, a very favorable prognosis.

Generally, endodontic failure occurs due to technical and pathological factors or it is influenced by systemic factors. The prevention of further complications coming from the maintenance of unsatisfactory endodontic treatment in a tooth that will support an intraradicular post and core and a fixed crown, demands the immediate root canal opening and justifies the retreatment necessity [9].

Strictly, all tooth, with or without the pulp vitality, is important for the stomatognathic system.
Often, the tooth is so valuable that its removal will develop certain conditions and solutions even more complicated [8, 15].

By this perspective, the aim of this study was to report a clinical case of the removal of an intraradicular post and core followed by endodontic retreatment in the upper central incisors’ area.

Case report

A female, Caucasian, 31-year-old patient sought for treatment due to apical sensibility at tooth #12 and a desire for replacing the crowns of tooth #11 and #21, which were worn and presented color alteration. In clinical examination, patient showed a good oral hygiene and sensibility to apical palpation and to vertical percussion in tooth #12. In the radiographic examination (figure 1), the radiolucent image was compatible with periapical lesion in teeth #12, #11, #21, besides the presence of an intraradicular post and core in teeth #11 and #21. During anamnesis, patient complained about her “fear of dental procedures”, due to a previous experience of pain during the treatments performed in these teeth. Patient’s general health was good, and she reported to be allergic to penicillin.

Patient’s file records a biopulpectomy followed by root canal obturation carried out in tooth #21, in January of 1975. Tooth #11 underwent the same treatment in January of 1977. Metallic-ceramic crowns were installed in October of 1984. In July of 1988, an apical abscess and fistula were diagnosed, in tooth #11, leading to this tooth apicectomy.

The proposed treatment comprised endodontic treatment in tooth #12, the removal of the intraradicular post and core followed by endodontic retreatment in teeth #11 and #21 and rehabilitation by prosthetic crowns. Patient was instructed regarding the risks inherent to the technique of intraradicular post and core removal and the possible failure in endodontic retreatment due to anatomical and bacterial problems within root canals, or diverse causes. Moreover, the probability of a new paraendodontic surgery still exists. Patient was also instructed that after treatment conclusion, the case’s follow-up would be necessary. Patient decides to undergo the aforementioned treatment, as her first choice, prior to an osseointegrated dental implant. Therefore, in June of 1997, a free and clarified consent form was signed by the patient in order to agree with the procedures to be executed, as well as, its risks.

Treatment was initiated by the endodontic treatment of upper right lateral incisor.

The next step was the removal of the crowns and intraradicular post and cores of the teeth #11 and #21, performed at the Clinics of the Specialization Course, in 1997. The prosthetic crowns were removed and a 1 mm depth horizontal sulcus at mesial-distal direction was executed, in the labial and palatal surfaces of the metallic post and core. Next, a mild worn was performed, at the cement line, in the dentin/metal junction, with a LN drill, in all post and core circumference [2], aiming to release the tensions exerted cervically during the moment of the post removal. Following, the active point of the crown puller was connected to the groove previously performed. Then, the device was parallely positioned into the post’s long axis and a removal force was applied by pressuring the device’s trigger, in order to release the pressure of the inner spring and generate an extractor force. It is worth noting that the force’s regulation and graduation for removing the post should be selected according to the apparent degree of difficulty presented at the radiographic examination. The device used in this report provides 4 degrees of increasing force, regarding to its regulation. In this case we employed only the first degree, that is, the slightest extractor force provided by the device. Thus, the intraradicular post and cores were removed. By the moment that the post and core of tooth #21 was removed, gutta-percha points were also eliminated and a spontaneous suppuration drained by root canal.

The filling material was carefully extracted in order to avoid the transforamen extrusion of the necrotic material, since there was no apical constriction in teeth #11 (due to the previous apicectomy) and #21 (due to the pathological dentin and cement resorption by the inflammatory process reactional to the necrotic material present within the root canal) (figures 2 and 3). Gutta-percha points and endodontic cement was easily removed, since they present a soft consistence and lack of condensation. Neutralization of root canal’s toxic septic content was carried out into crown-apex direction by immediate technique [13], followed by serial instrumentation up to size 60 file [5, 11, 12, 14].

After shaping, 17% EDTA solution (ethylenediaminetetraacetic acid) was used for three minutes, under agitation with instrument for removing and neutralizing the smear layer [10, 15]. Posteriorly, inter-appointment medication was performed with PMCC and provisional crown cementation.

In the following appointment, teeth received calcium hydroxide, for 30 days, as intracanal medication, aiming to potentialize the process of sanitization reached during the shaping phase.
At the moment of canal obturation, we carefully assured that tactile sensation of master point adaptation and tugback was reached.

After root canal obturation, their 2/3 [13] was cleared in order to constructed a new metallic post and core. Treatment was continued without patient's complaints. Then, after the cementation of intraradicular post and core and the definitive crowns, in October of 1998 (figure 4), the case was followed-up. After 36-month post-installation, no signs and symptoms were reported, as seen by the radiograph (figure 5).

In 2010, after 13 years, the patient returned for a follow-up appointment. The clinical silence and the radiograph presenting the evidence of the area's bone repair proved the good treatment choice, as well as, its success (figure 6). Patient reported no complaints and a very degree of satisfaction with the treatment. Patient also signed a free and clarified consent form for authorizing this report publication.

Figure 1 – Initial periapical radiograph

Figure 2 – Radiograph showing root canal cleaning of tooth #21

Figure 3 – Radiograph showing root canal cleaning of tooth #11

Figure 4 – Radiograph after intraradicular post and core and the metallic-ceramic crowns cementation, after 12-month post-root canal obturation
Discussion

Longitudinal follow-up control of the radiographic aspects, concerning signs and symptoms, constitutes a tool used for determining the success of endodontic treatment. As an initial clinical and radiographic parameter for the assessment of endodontic treatment outcome, a one-year follow-up period could be established in cases of vital pulp and a two-year follow-up period in cases of endodontic infections [9].

The radiographic examination is an important auxiliary method in determining the quality of endodontic treatment; it is capable of suggesting the normality or abnormality of tooth periapex, the quality of the canal obturation at the apical limit, and the filling material condensation [4].

According to Estrela [9], the following factors are essential for endodontic treatment success: clinical silence (lack of pain, edema, and fistula), normal periapical bone structure (lamina dura's uniformity, normal periodontal space, lack or reduction of bone rarefaction, lack or interruption of root resorption), tooth in function, and presence of a perfect coronal sealing.

In this clinical case, the previously performed biopulpectomy in teeth #11 and #21 resulted in treatment failure, characterized by a periapical lesion. It is suggested that the incomplete filling of root canal systems, presenting empty spaces, allowed the invasion by microorganisms and interstitial liquids, which act as irritating agents to the periapical tissues. Root canal obturation is one of the factors responsible for microbial controlling, which emphasizes its important role as a decisive contributing factor of the tissue repair process. The filling material within root canal must completely fill it, without irritation, and preferably stimulate the cure of periapical tissues. The obturation role is to prevent the microorganisms' invasion and colonization of the surround tissues and control the virulence potential [9].

Endodontic retreatment should be carefully indicated by an accurate assessment of its risks and benefits. Therefore, the clinical case should be studied in order to plan the actions to be executed and define the most opportune therapeutical options, which will prevent persuasive and unpleasant situations [9]. This therapy commonly involves approaches requiring the clinician's experience, because it is not always possible to follow the normal techniques of the endodontic treatment. In
In the case presented here, the removal of the intraradicular post and core was performed by a crown puller operated by a spring (Otto Metalurgica Armiger, Brazil), according the technique described by Estrela [9] (figure 7).

In the final radiograph, it could be seen the endodontic cement overflow at the apex of tooth #21. Although the tactile sensation of master point adaptation was present at the moment of root canal obturation, this was not capable of avoiding the filling material overflow. Large root canals, as exhibited by the central incisor with dentin and cement resorption at the apical surface of the root, have been most likely to filling material overflow. Root resorption alters the internal morphology of root canal, distorting the dentin-cement junction, eliminating the apical constriction used for the obturation limit [8]. Tooth #11 presented a more evident difficulty for master point tugback, because the previous surgery leaded to the loss of structure, at tooth apex. Healing is delayed or incomplete around areas of overflowed filling material due to a foreign body reaction [8]. On the other hand, if the overfilling is not exaggerated, in order to extinguish root canal infection and prevent the contamination during treatment [6], as seen in this case report, complete healing is obtained.

The performed treatment avoided a new surgery. This was entirely desirable because the apicectomy is a bloody surgical procedure that it is not usually well accepted by the patient, demanding a greater patient's sacrifice and organic reactions [8]. The evolution of concepts, techniques, and material's properties has reduced surgery referrals [7, 8, 9]. Berger [3] cited that periodontic surgery has been performed more carefully due to the researches in this field. When endodontic retreatment is not possible, the canals cannot be reached through the crown, or intraradicular post and core cannot be removed due to greater risk of tooth fracture, the periodontic surgery is still an option. According to Danin et al. [7], periodontic treatment is an auxiliary tool and it should not be the treatment's first option. The authors emphasized that its success rates ranged from 50 to 90%.

**Conclusion**

The clinical and radiographic success could be observed after a 13-year follow-up period. By this outcome, it can be concluded that both the diagnosis and case management were correct.

**References**


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