

## Rehabilitation using endodontic and adhesive techniques in periodontal disease. Case presentation

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### Summary

**Objectives:** To present a complex therapeutical schema for a periodontitis case patient. **Methods:** The clinical exam is revealed and also the endodontic treatment steps, the access cavity restoration and the splinting method are described. **Results:** The results of the endodontic, restorative and periodontal treatment are considered satisfying. **Conclusions:** The adhesive techniques were used in the present case to restore the affected crown and also to obtain a performant splinting. The endodontic therapy complicated and prolonged the treatment of periodontal disease in this patient.

**Key words:** endodontic therapy, adhesive techniques, periodontal disease

Tooth mobility is one of the symptoms of advanced periodontal disease and is a consequence of the lost of periodontal support; teeth migrations may be associated. Advanced tooth mobility may be associated with functional dysfunctions as secondary occlusal trauma or subjective symptoms as discomfort or pain.

This article describes the case of a patient with medium periodontal destruction associated with an endodontic pathology that necessitated a complex, multidisciplinary therapeutical approach.

### Case presentation

A 43 years old patient from our data base, with the medium generalized chronic periodontitis, being in the maintenance phase after initial therapy was referred with a fistula. The lesion was localized in facial area, on the attached gingival between the two first mandibular incisors. The clinical exam revealed sound crowns. The periodontal exam revealed 4-5 mm facial gingival recessions associated with anterior mandibular teeth, a normal probing depth (*Fig.1*); the facts excluded the periodontal etiology of the fistula. A two degree mobility score for the mandibular incisors was recorded. Vitality test showed the lack of the vitality of the

left first mandibular incisor. The history did not reveal any explanation for the lost of vitality.



*Fig.1. Gingival recessions associated with anterior mandibular teeth*

The radiographic exam revealed the presence of a lateral periradicular lesion associated with the first mandibular left incisor (*Fig. 2*).

The decision of a conservative endodontic approach was made. The endodontic protocol had in view that periradicular lesions are diseases either primarily or secondarily caused by microorganisms and root canal infections should be considered polymicrobial and treated accordingly. We chose an endodontic therapy to be able to eradicate pathogenic microorganisms effectively.

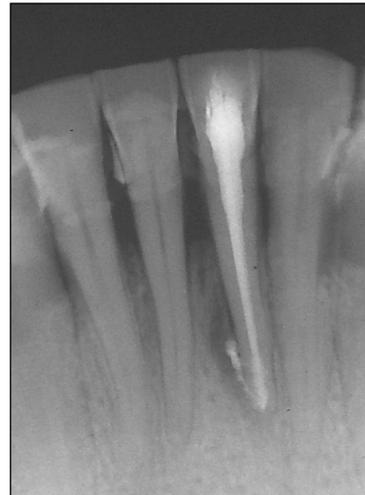
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*Fig.2.-Periapical lesion associated with left first mandibular incisor*



*Fig.3.- Radiographic aspect of the final endodontic treatment*

The endodontic treatment involved three steps in order to control of the root canal infection: the chemomechanical preparation, the intracanal medication and the root canal obturation [1].

Because most of the intracanal bacteria are located in the main root canal, the chemomechanical preparation was considered an essential step in the root canal disinfection. The removal of the irritants from the root canal system was carried out through mechanical action of instruments and the flow and backflow of the irrigant solution. The hand system ProTaper® (Dentsply-Maillefer) was used to perform the mechanical enlargement, using a protocol detailed by Pertot et Simon (2004) [2]. A 2.5% sodium hypochlorite solution was used as irrigant solution, because it is considered to be the irrigant of choice in root canal therapy [1].

Root canal was medicated with calcium hydroxide (Calxyd®, Spofa Dental) between dental visits.

A weekly change of the intracanal medication was performed for the first month; a monthly change of the medication was performed for the following 4 month. The prolonged treatment was realized in order to observe the eventually periapical regeneration by radiographic follow-up. Because the fourth month radiography revealed a decrease of the periapical radiolucence, the permanent root canal filling was realized using Termafil® technique and Sealapex® (KerrEndo)(Fig.3).

The following step was to restore the access cavity. We chose to use a classic adhesive system, Optibond FL® (Kerr) in order to obtain a good enamel bond for protecting the underlying dentin bond which is less durable [3]. A light-cure hybrid composite resin (Herculite HRV®, Kerr Company) was used. The restoration was finished and polished.

To allow appropriate periapical regeneration and to prevent the loss of the vitality for the other teeth, an anterior mandibular splinting was realized immediately after the first endodontic appointment (Fig. 4, 5). A provisional splinting technique using polyethylene fibers (Construct®, Kerr) and a direct adhesive technique was performed. The adhesive protocol respected the manufacturer's guide and the general knowledge [4].



*Fig.4-Provisional splinting-lingual view*



*Fig.5.-Provisional splinting-facial view*

The long term radiographic follow-up was planned.

## Discussion

Periodontal disease does not produce pathological changes in the pulp until major lateral canals become contaminated by oral biofilm. The removal of the intact layer of cementum by scaling and root planning procedures may cause the infection of dentinal tubuli and eventually the further necrosis of the pulp. In the present case, we consider that the lack of dentinal hypersensitivity after the mechanical therapy didn't sustain this pathologic pathway.

We consider that the lost of the vitality of the incisor is due to the secondary occlusal trauma associated with the tooth mobility. The mobility was not marked but enough to injure the pulp and to produce necrosis. Necrotic pulp induced as a consequence of injury, lost its defense capability; as a result, microorganisms colonized the root canal system.

Regarding the endodontic protocol that was used, we had in view the fact that root canal infections possess some peculiarities that differentiate them from infections in other human sites. Once established, a root canal infection cannot be eliminated by the host defense mechanisms nor by systemic antibiotic therapy, because the bacteria presented in the root canal are in a privileged "sanctuary", where the absence of blood supply impedes the transport of defense cells and molecules [1]. Due to anatomical localization of the endodontic infection, it only can be treated through professional intervention using both chemical and mechanical procedures. So an efficient chemomechanical protocol was crucial for the success of the therapy.

The use of Protaper® system was based on the fact that a higher success rate for endodontic treatment has been reported for teeth instrumented with hand NiTi files when compared with teeth prepared with hand stainless steel files [5]. Instrumentation with a large diameter files sizes can result in better irrigant exchange in the apical third of the root canal. Since large preparations remove more bacterial cells, a higher rate of treatment success can be expected.

The use of the intracanal medications was sus-

tained by evidence revealing that microorganisms are rarely completely eliminated from the root canal regardless of the instrumentation technique and file size employed [6]. There are some areas (isthmuses, culs-de-sac, dentinal tubules) that are not commonly affected by the chemomechanical preparation because the inherent physical limitations of instruments and the short time the irrigants are present within the root canal. Remaining pathogens may survive in sufficient numbers to jeopardize the outcome of the root canal treatment [7]. Antimicrobial intracanal medicaments have a higher probability to reach microorganisms located in areas unaffected by the chemomechanical preparation and thereby help in disinfection of the entire root canal system. Calcium hydroxide is acknowledged as one of the most important antimicrobial dressing endodontic therapy; most endodontopathogens are unable to survive in a highly alkaline environment and are eliminated after a short period when in direct contact with this substance [1].

The chosen Thermafil® technique to fill the canal had in view the fact that thermoplasticized gutta-percha techniques can provide a more homogenous mass of obturation and a better filling of root canal intricacies when compared with the traditional lateral condensation technique [8].

One of the goals restoring the tooth after root canal therapy is to prevent recontamination of the root canal system [3]. The restoration of the access cavity used a rigorous protocol in order to obtain a performant adhesive bond. The main adhesive protocol was used in order to splint the mobile teeth.

## Conclusions

The adhesive techniques were used in the present case to restore the affected crown and also to obtain a performant splinting. The endodontic therapy complicated and prolonged the treatment of periodontal disease in this patient. So an interdisciplinary approach using restorative, endodontic and periodontal techniques was addressed for the present case.

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