Case Report

Endo-Perio Lesion and Uncontrolled Diabetes

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1. Introduction

The term “endo-perio” lesion emerged decades ago to designate a specific disease condition affecting the pulp and the periodontal tissues simultaneously [1, 2]. Diabetic patients are more exposed to oral infections and periradicular lesions caused by the changes of their immune system, qualitative and quantitative changes in normal flora of their oral cavity, and poor peripheral blood supply.

The pulp properties are changing with the aging process; moreover, uncontrolled diabetes can cause changes of the dental pulp tissue and reduce its activity by reducing the collateral blood flow. Since diabetes damages the blood circulation or causes ischemia, sometimes necrosis of the pulp may occur [3, 4].

The possible connection between chronic oral inflammatory processes, such as apical periodontitis, endodontic state, and systemic health, is one of the most interesting aspects faced by medical and dental scientific community, by monitoring the potential of healing after stabilization of all the parameters, in the present case, the inflammation and the infection states in a diabetic ground.

2. Case Report

A 50-year-old female patient, with uncontrolled type 2 diabetes, is suffering from a purulent discharge coming from number 13 sulcus, with dental mobility (grade 3) and no apparent decay, fracture, or fissure (Figure 1).

Initial periodontal treatment: nonresponsive (Figure 2). The sensitivity tests: all negative. Radiography: severe bone loss related to a periapical lesion (Figure 3).

3. Diagnosis

Diagnoses of the patient were primary periodontal disease with secondary endodontic involvement and chronic generalized periodontitis as a manifestation of systemic diseases (diabetes) (American Academy of Periodontology Classification, 1999).

3.1. Therapeutic Decision. Therapeutic decision was made after management of periodontal disease with scaling and root planning, patient education, and a program of periodontal hygiene maintenance (the protocol followed is the one recommended by Abbott [1]).

Endodontic treatment was administrated in two visits:

(1) First appointment

(i) Patient under amoxicillin medication two days before the RCT treatment and the week following the procedure (collaboration with her internist doctor)
(ii) Realization of the access cavity under a dental dam and without local anesthesia

(iii) Mechanical preparation of the root canal system using ProTaper Universal® rotary system (Dentsply International)

(iv) Chemical disinfection using 2.5% sodium hypochlorite

(v) Temporary filling of the root canal with calcium hydroxide

(vi) Placement of an adequate temporary coronal filling (Cavit™ 3M ESPE)

(2) Second appointment

(i) Adequate mechanical debridement of the root canal using stainless steel K-files combined to ProTaper Universal rotary files

(ii) Irrigation using 2.5% sodium hypochlorite

(iii) Proper drying of the root canal using sterile paper cones

(iv) Tridimensional root canal obturation using Thermafil® (Dentsply Maillefer) (Figure 4)

During the preparation of the root canal system since the first appointment, there was no exudation coming from the root canal.

3.2. Two-Week Follow-Up (Figure 5).

(i) Beginning of bone reorganization

(ii) Decrease but without disappearance of the purulent discharge

(iii) Decrease of dental mobility
(iv) Stabilization of the patient’s blood sugar level with the collaboration of the internist doctor

3.3. Two-Month Follow-Up (Figure 6).

(i) Stabilization of the radiolucent image revealed by radiographic examination

(ii) Beginning of bone reorganization

(iii) Decrease but without disappearance of the purulent discharge (Figure 7)

3.4. Six-Month Follow-Up

(i) Persistence of the purulent discharge from the sulcus was noted.

(ii) An open flap for periodontal cleaning was realized with a debridement of the root surface, and a full periodontal therapy was established to complete the treatment and to obtain a periodontal attachment repair (Figures 8 and 9).

(iii) Periodontal splinting was used to reinforce and improve the healing potential of the tooth in question (Figure 10).
3.4.1. The Six Months’ Recall Revealed

(i) Soft tissue healing with gingival recession located on number 13 (Figure 10);

(ii) A complete disappearance of the purulent production;

(iii) Partial bone regeneration with apparent bone trabeculations in the former radiolucency (Figure 11).

3.4.2. At 18 Months and 39 Months’ Recall

(i) A progressive bone healing after 18 months was observed, then 39 months with a disappearance of the former radiolucency (Figures 12, 13, and 14).

This glycosylated hemoglobin curve demonstrates that the patient has an imbalanced diabetes (the treatment was established on February 2015.) (Figure 15).

4. Discussion

Diagnosis of primary endodontic disease and primary periodontal disease usually represents no clinical difficulty [2, 5]. Many classifications of endo-perio lesion are found in the literature; Simon et al. (1972) used a classification to separate lesions involving both periodontal and pulpal tissues into the following groups:

(i) Primary endodontic lesions with secondary periodontal involvement
Diabetes mellitus (DM) is a significant and increasing global health problem. In 2013, the International Diabetes Federation estimated that there were 382 million people worldwide with diabetes increasing to 592 million in 2015 with the major part of this population is living in low- and middle-income countries [13, 14].

It is defined as a group of metabolic disorders characterized by chronic hyperglycaemia with disturbances in carbohydrates, fat, and protein metabolism resulting from defects in insulin secretion, insulin action on the target tissues, or both, and it is frequently associated with an increased susceptibility to infection [15–17].

Both diabetes mellitus type 1 (DM1) and type 2 (DM2) present numerous possible long-term complications. Epidemiological studies indicate that the severity of diabetic complications is generally proportional to the degree and duration of the hyperglycaemia.

Among the oral manifestations related to DM described are dry mouth, tooth decay, periodontal disease and gingivitis, oral candidiasis, burning mouth syndrome (BMS), taste disorders, rhinocerebral zygomycosis (mucormycosis), aspergillosis, oral lichen planus, geographic tongue and fissured tongue, delayed wound healing and increased incidence of infection, salivary dysfunction, altered taste and other neurosensory disorders, impaired tooth eruption, and benign parotid hypertrophy. Similar to the periodontium, the dentin-pulp complex is also affected by diabetes. Zehnder et al. [10] reported that angiopathy represented by a thickened basement membrane was observed in the dental pulp of diabetics. But still no systematic studies about the direct effect of the diabetes on the pulp tissue.

Periodontal healing after a proper RCT depends on the biological constants including the rate of blood sugar levels. Clinical and radiological follow-up must be completed with glycemic control which reveals in our case a chronic uncontrolled diabetes with regular visit controls with the internist doctor [18–20].

Lesion’s age makes the prognosis of an endo-perio lesion much more uncertain, in periodontal pocket, complicated the lesion management. Bacterial ecosystem of chronic lesion adapts itself and becomes more resistant to endodontic and periodontal treatments [19, 21, 22].

Healing potential of an endodontic lesion is very high if the lesion is surrounded with 5 or 6 bone walls (Machtou and Cohen, 1988). According to Ng et al., Kambale et al., and Rudranaik et al. “the larger is the part caused by pulpal infection, the better the prognosis of attachment regeneration” [23–25].

5. Conclusion

The primary goal of all treatment must be to rid the patient of the infection.

Endodontic treatment success criteria were established in 1994 by the European Society of Endodontology and included the following:

(i) Absence of pain, swelling, and fistula
(ii) Maintenance of tooth function

(iii) Presence of radiological evidence of a normal periodontal ligament space

(iv) Absence of apical periodontitis or radicular resorption

It can be stated that, in the majority of the endo-perio lesions, the bacterial etiology dictates the clinical course of the disease and therefore the treatment plan.

Changes in the immune system defense in diabetic patients against infection and pathological changes in pulp and periradicular tissue, lack of awareness of patients about the effect of diabetes on oral health, asymptomatic dental infections, poor dental and oral health, and lack of regular visit to dentists because of its high costs all may have influence.

Other factors, such as patient cooperation, restorability, and economics, will influence treatment decisions.

Neither periodontic nor endodontic treatment can be considered in isolation; clinically, they are closely related, and this must influence the diagnosis and treatment.

The clinical burden of diabetes is high in Morocco, and the majority of patients do not achieve the recommended glycaemia target, suggesting that there is a huge gap between evidence-based diabetic management and real-life practice. Better education of patients and improved compliance with international recommendations are necessary to deliver a better quality of diabetic care [14].

Disclosure

The manuscript has been presented as a poster in the Biennial Congress of the European Society of Endodontology, September 2015, Barcelona, Spain.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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