

PERIODONTICS · CLINICAL CASE

Use of radiofrequency in diabetic patients with periodontal disease and peri-implantitis: a clinical case report

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Abstract

Diabetic patients present periodontal diseases as part of the complications of the underlying disease. It is known that there is a high incidence of implant failure and other complications. A case is presented of a diabetic patient with poor glycaemic control, in whom dental implants were placed and treated with radiofrequency using a C-500 Intraoral Capenergy device. An excellent recovery was obtained after four treatment sessions.

Introduction

There is sufficient information demonstrating that diabetes is a risk factor for gingivitis and periodontitis, and the level of glycaemic control appears to be an important factor in this relationship. Strong evidence has led to the suggestion that periodontitis should be counted among the "classic" complications of diabetes. Periodontal diseases can induce or perpetuate a chronic systemic inflammatory state; elevated circulating levels of several pro-inflammatory cytokines have been found in individuals with periodontitis.

The incidence of biological complications recorded in diabetic patients with peri-implant pathology is between 8 and 9%, while the risk of implant failure is up to 14.3%. Although many diabetic patients show improvement in the clinical parameters of the disease immediately after therapy, patients with worse glycaemic control may have a higher recurrence of deep pockets and a less favourable long-term response. The use of radiofrequency (RF) and infrared light (IR) has been tested on molecular markers of cell turnover (Ki67, p53) and the expression of pro-inflammatory cytokine TNF- α in the oral cells of patients of various ages with chronic periodontitis; results showed that electromagnetic radiation and IR increased expression of the proliferative marker Ki67 and decreased expression of the pro-apoptotic protein p53 and the pro-inflammatory cytokine TNF- α . Radiofrequency, through the increase in temperature, also increases vascularity, raises apoptosis and modifies the inflammatory response.

Clinical case presentation

A 53-year-old male patient was referred to this clinic with a history of periodontal disease and peri-implantitis. A fairground worker, with poor oral-hygiene habits and failed attempts at oral rehabilitation due to infection and serious healing problems. His history included hepatitis C, and he was diabetic, hypertensive, morbidly obese and a habitual smoker.

Given the failure of other medical–dental treatments, four radiofrequency sessions were applied using a C-500 Intraoral Capenergy dental radiofrequency device. A pre-surgical session prepared the tissue with a moderately thermal treatment at 37 °C for 10 minutes, using a capacitive electrode at 50% power (maximum 310 W per channel, i.e. 155 W). A second session applied the electrode to the treatment area, also at 50% power for eight minutes, reaching 37 °C. The third and fourth sessions followed the same 8-minute protocol. The oral cavity was assessed initially with a panoramic radiograph and with pre-surgical thermographic images to evaluate the state of the micro-vascular network and its tissue perfusion.

Results and discussion

Before treatment with the C-500 Intraoral device, the tissue temperature dropped to 35.7 °C. After one session the tissue temperature increased by half a degree, meaning greater blood supply, cellular and metabolic

activation, enhancement of the immune response, and tissue oxygenation and nutrition — providing better conditions to face surgery. One week after surgery, baseline tissue temperature had improved; good healing was observed, with no signs of infection, no pain and controlled inflammation. In the following weeks, baseline tissue temperature increased, healing was adequate, and there were no signs of infection, pain or inflammation.

Despite the patient not meeting his glycaemic controls, the temperature increase and the effects of radiofrequency on the gingival region showed a high healing capacity, helping the implant and the peri-implant region to recover normality in a short period of time.

Conclusions

The specialised radiofrequency provided by the C-500 Capenergy dental medical device, through the properties of radiofrequency hyperthermia, is an excellent alternative for the prevention, control and resolution of problems in implantology and dentistry in general — shortening treatment times, controlling infection, inflammation and pain, and ultimately achieving faster and more satisfactory recovery for the patient.

Reference

Rodríguez Lastra J. Use of radiofrequency in a diabetic patient with periodontitis and peri-implantitis. *El Dentista Moderno*. 2018;38:44-48.