

DIABETES AND IMPLANT TREATMENT: A CASE REPORT

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ABSTRACT

Diabetes mellitus (DM) is a systemic disease with several major complications affecting both the quality and length of life. One of these complications is periodontitis, which may cause on its behalf changes in systemic physiology. On the other hand, literature indicates that a similar incidence of periodontitis exists between well-controlled diabetics and non-diabetics. DM is also a leading cause of blindness, kidney failure and amputations of the lower extremities. These complications result from micro-vascular disturbances associated with it. Until recently, DM is considered a relative contra-indication for implant therapy and such treatment may be denied to some people with uncontrolled diabetes because the risk for periimplant infection and even lack of osseointegration is much higher. Undoubtedly, the best steps to avoid the presence of ailing or failing implants involve proper case selection, excellent surgical technique, placing an adequate restoration on the implant, educating the implant patient to maintain meticulous oral hygiene and evaluation of the implant both clinically and radiographically at frequent recall visits.

Keywords: diabetes mellitus, periodontitis, dental implants

Introduction

Is the diabetic patient to be considered unsuitable for implant treatment, or is modern implantology applicable even to patients with diabetes? Long-term clinical success of endosseous dental implants is critically related to a wide bone-to-implant direct contact (3). This condition is called osseointegration and is achieved ensuring a mechanical primary stability to the implant immediately after implantation (6). Both primary stability and osseointegration are favoured by micro-rough implant surfaces which are obtained by different techniques from titanium implants or coating the titanium with different materials (5). These rules are equally applicable to controlled diabetic patients as they are to any other patient. In such cases, the post surgical control and professional care following the treatment should be maintained on much stricter basis (1).

The aim of this survey is to show that the good control of plasma glycaemia (with proper means like insulin), depending on diabetes' type, together with other measures (periodontal treatment, plaque control, proper diet) may improve the percentages of implant survival in diabetic patients.

Materials and Methods

A healing periodontal surgery of upper and lower jaw was implemented, preceded by a period of initial therapy.

Six titanium implants were inserted following two stage surgery protocol. Part of the teeth were endodontically treated using crown down technique. As the chewing plain was inadequate, the extreme importance of the occlusal-articulation relationships necessitated the use of medium size face bow. The upper jaw imprint was taken with polyether materials using the open transfer technique. A conventional suprastructure

manufacturing technology was applied using metal-ceramic with non-precious alloy.

Case report

A 65-years old patient, male, smoker (I.K.) who is a well-controlled diabetic is presented. As it can be seen from the X-ray image, he suffered from severe periodontitis. The bone resorption is massive (the bone loss is generalized) and more prominent around the lower front and around molar bifurcations (**Fig. 1**). He was put to several plaque control manipulations. Following them, some lower jaw teeth were extracted and periodontal surgery was accomplished. To save time, after the healing period, 6 implants were placed on the upper jaw (**Fig. 2**). Next, the essential healing periodontal surgery on lower jaw was initiated. The implants were uncovered in four months and then loaded with fixed restorations of the splint-bridge type implant. The patient visits the practice on a regular basis for scheduled examination and oral hygiene maintenance. Records (picture and X-ray images) are kept of these monitoring and maintenance procedures. Three years after the treatment, there is no clinical or X-ray evidence of bone resorption or gum inflammation.



Fig. 1. OPG before treatment



Fig. 2. OPG after placement of implants

Results and Discussion

Three years after the implant therapy a well-controlled diabetic, properly maintained, is an excellent example of full implant survival. In the course of healing, parodontal surgery was performed, bifurcation class IV after necessitated premolarization of 3b and 4b. Tight light pink gingiva around the prepared teeth is shown on **Fig. 3**. If there are no pathological changes in the temporomandibular joints the masticatory plain can be determined following mean values as well (**Fig. 4**). The abutments and the constructions were made on a single model; the abutments were fixed at 25 Ncm torque, and the opening was filled with temporary dental cement filling (**Fig. 5** and **Fig. 6**). The expectations of the patient for his final aesthetic appearance were completely satisfied: the teeth, gum and lips (seen in **Fig. 7**) matched to form a harmonious ensemble. The considerable bone loss in the lower jaw necessitated the use of some pink coloured ceramics (seen in **Fig. 8**) to imitate and compensate for the missing gingival tissue. No deviation from the successful implant prosthetics has been detected for the three-year period of monitoring the patient (**Fig. 9**).



Fig. 3. Clinical view after periodontal surgery



Fig. 4. Determining the masticatory plain with face arch/bow is extremely important for the success of the treatment



Fig. 5. The abutments after their individualization and fixation



Fig. 6. The final maxillary restorations



Fig. 7. The final maxillary restorations (closer view)



Fig. 8. The final mandibular restorations



Fig. 9. OPG three years after the case was completed

Dental implantology represents an essential step in the rehabilitation of function, stability and aesthetics of the human dentition. Moreover, implant therapy is highly predictable and successful. However, certain risk factors can predispose individuals to lower rates of success – for example smoking, a history of periodontitis, genetic traits and uncontrolled diabetes mellitus. These factors lead to compromised bone and soft tissue healing and to periimplantitis (2). However, most of the studies cannot give statistically significant difference in the survival rates of the implant treatment between well-controlled diabetics and non-diabetics. Diabetes also increases the risk of periodontal diseases and biologically plausible mechanisms have been demonstrated in abundance. Less clear is the impact of periodontal diseases on glycemic control of diabetes and the mechanisms through which this occurs. Inflammatory periodontal diseases may increase insulin resistance in a way similar to obesity, thereby aggravating glycemic control (5). Further research is needed to clarify this aspect of the

relationship between periodontal diseases and diabetes. Besides, no studies, dividing dental patients according to the diabetes' type (1 or 2), were found in the accessible literature. This is probably a widely opened door to further serious researches. Only a single survey shows that type 2 diabetic patients tend to have more failures than non-diabetic patients; however, the influence is marginally significant (6). These findings need to be confirmed by other scientific, clinical studies with a larger group of type 2 diabetic patients.

Conclusions

The suitable treatment of diabetes mellitus allows people to live normally and to afford modern therapies like implantology. It's possible to say now that the indications for implantologic treatment are much more and diabetes mellitus is no longer a contra-indication. There is a statistically significant greater loss of attachment ($p < 0.05$) around implants in study groups with severe periodontitis compared to no/mild periodontitis groups. Similarly to the experience of other authors (7), as greater loss of clinical attachment might be experienced around implants placed in patients with generalized severe chronic periodontitis, close monitoring of these patients is suggested to prevent both development of peri-implantitis and recurrence of periodontal infection.

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