Ten years follow-up after dental implant therapy in patient with a chronic periodontitis: a case report

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Abstract
Periodontal disease is characterized by progressive destruction of the periodontium, the alveolar bone and it is regarded as a leading cause of tooth loss in the adult population. These patients represent a unique group of potential candidates for dental implant therapy. A major consideration for the clinician is to determine the influence of the disease on the placement and survival of implants, because according to the literature, patients with a history of periodontal disease, manifested significantly greater peri-implant marginal bone loss with a higher incidence of peri-implantitis and shorter longevity compared with periodontally healthy patients. The objective of the present case study is to demonstrate the multidisciplinary treatment approach in a patient with a severe chronic periodontitis and the outcome of implant therapy after 10 years follow-up. The authors present a case of 53 years old women with chronic inflammatory periodontitis but stable periodontal status, due to effective anti-infective therapy. The operative phase included extraction of the hopeless teeth with immediate dental implant placement and immediate placement of provisional. The reevaluation demonstrated good control of the gingival inflammation and stable periodontal status of the remaining teeth. The subsequent implant and prosthetic treatment led to the restoration of a functional dentition without any peri-implant mucositis or peri-implant bone loss after 10 years follow-up. The conclusion The long term success of the treatment of the complex cases with severe chronic periodontitis depends significantly upon the proper control of the periodontal infection and the achievement of a stable periodontal status of the residual dentition. With excellent functional and aesthetic results, without any peri-implant mucositis or peri-implant bone loss after 10 years follow-up.

Keywords
Chronic periodontitis; Multidisciplinary dental rehabilitation; Dental implants; Immediate implantation

1 Introduction
Periodontal disease is characterized by a variety of pathologic conditions that affect the health of the periodontium. The progression of the disease lead to different problems - gingival recessions and inflammation, insufficiency of attached gingiva, destruction of tooth-supporting structures including the periodontal ligament, connective tissue and bone, with tooth mobility and finally tooth loss.

Periodontitis is regarded as a leading cause of tooth loss in the adult population and those patients represent a unique group of potential candidates for dental implant therapy. As an increasing number of patients receive implant therapy to replace missing teeth due to periodontal disease, the question arises as to whether the outcome of dental implants is influenced by a history of periodontitis (Heitz-Mayfield and Huynh-Ba, 2009). A major consideration for the clinician who plan the patient rehabilitation with dental implants is to determine the influence of this disease on the condition of the residual alveolar crest with adequate bone quality and quantity for implant placement and maintenance with long term survival of implants.

According to the literature, patients with a history of periodontal disease compared to individuals who were periodontally healthy, manifested significantly greater peri-implant marginal bone loss with a higher incidence of peri-implantitis and shorter longevity (Evian et al., 2004; Listgarten, 1986).
A history of periodontal disease, smoking, excess cement and lack of supportive therapy should be considered as risk factors for the development of peri-implantitis (Renvert et al., 2015). Peri-implantitis has been reported to occur in the range of 1, 4 to 53.5% (Buser et al., 2012; Fardal and Grytten, 2013).

Also it has been suggested that patients with aggressive forms of periodontitis are at higher risk for implant failure in comparison to chronic periodontitis.

To obtain long-term success of dental implant therapy, it is essential that the patient can maintain healthy peri-implant tissues, without inflammation. Studies show that patients with a history of periodontitis with carefully monitored supportive periodontal therapy (SPT) and proper management, show implant survival at 5- and 10-year follow-up, and prove dental implants to be a successful treatment modality with a predictable outcome. Al-Zahrani et al., (2008) demonstrated 5-year survival rates of 89% in AP patients undergoing SPT; however, bone loss occurred more often in these patients in comparison to patients with chronic periodontitis and periodontally healthy individuals.

2 Objective
The objective of the present case study is to demonstrate the multidisciplinary treatment approach in a patient with a severe chronic periodontitis and the outcome of implant therapy after 10 years follow-up.

2.1 Methods
Our patient T.D female, age 53, non-smoker had previous dental history of chronic periodontitis. Medical history was without any chronic systemic disease. The patient undergo further clinical and paraclinical preoperative evaluation (Figure 1). Afterwards an implant supported prosthodontics restoration was planned. Hence, cost per unit of bait was derived using.

The surgical phase included extraction of the teeth 11, 15, 22, 25, 26, 27 in the upper jaw and extraction of the teeth 31, 35, 41, 42, 44 in the lower jaw. After the extraction of the mandibular central and lateral incisors we augmented these area with bone substitute spongiosa granulate material -Bio-Oss ® with Bio-Gide ® collagen restorative membrane, as well as augmentation in the other regions after immediate implant placement.
In the maxilla were inserted Ankylos® dental implants: 4, 5/14 implant on the right side and Ankylos® 4, 5/11 mm; 3, 5/11, mm on the left side (Figure 2 a, b)

Four Ankylos® implants (3, 5/14; 4, 5/11; 3, 5/11; 3, 5/14) were inserted in the mandible in the same procedure (Figure 3 a, b, c, d, e)
In the same phase an immediate provisional prosthodontics restoration was placed in frontal mandibular region in non-occlusion position (Figure 4).

After implantation procedure the correct position of dental implants and their relations with neighboring anatomical structures was checked by orthopantomography (Figure 5).

After period of 4 months (Osseointegration period) the second phase of combined treatment was done, which included uncovering of the implants, soft tissue remodeling, taking impressions and laboratory technical procedures of making the definite prosthodontic suprastructure (Figure 6; Figure 7). The permanent prosthetic work consists of single-unit bridges in both jaws.

The patient in the following period was constantly re-calling for regular clinical check-ups, especially considering the status of the soft and hard tissues (Figure 8).

After 10 years period the X-ray shows bone loss on the mesial side of the right second molar in the maxilla, without any peri implant bone loss which is considered as a good treatment outcome (Figure 9).
3 Discussion

In partially edentulous patients, periodontal pathogens have been shown to translocate from periodontally involved teeth to the sulcus surrounding implants in the partially edentulous patient (Leonhardt et al., 2002). This highlights the importance of supportive periodontal therapy and treatment of involved teeth prior to the placement of dental implants. With this in mind, extraction of hopeless teeth, ridge augmentation, and possible socket preservation may lengthen treatment duration prior to implantation. Furthermore, the presence of periodontal inflammation and periapical lesions often delays the placement of bone grafts and further placement of implants (Schou et al., 2006; Bencharit et al., 2010).

According to the literature the survival of implants is not significantly different in individuals with periodontal disease and periodontally healthy subjects after 5 year follow-up. When comparing outcomes, implant placement in patients with periodontal disease, peri-implantitis, bleeding on probing, and radiographic signs of marginal bone loss was significantly higher.

The current literature demonstrates favorable results among patients with a previous history of periodontitis, with survival rates ranging from 79% to 92.8% at the 10-year follow-up (Hardt et al., 2002; Roccuzzo et al., 2010;
Mengel et al., 2007). Studies also frequently reported marginal peri-implant bone loss, revealing comparable results in both group populations.

According to Hardt et al., overall implant survival rates of 94.8% were demonstrated, with a survival rate of 92% in patients with chronic periodontitis versus 96.7% in periodontally healthy patients. In comparing differences in mean bone loss after 5 years between these two groups, there were no statistically significant differences found (Hardt et al., 2002).

A 10-year prospective study conducted by Karoussis et al., patients with a previous history of periodontal disease had a significantly higher incidence of peri-implantitis (28.6% vs. 5.8%) than healthy subjects, implant survival rates were 90.5% in patients with a history of chronic periodontitis, compared to 96.5% in periodontally healthy subjects (Karoussis et al., 2003).

Supportive periodontal therapy was shown to be an effective method of periodontal maintenance when placing implants in patients with chronic periodontitis. Roccuzzo and his colleagues demonstrated survival rate of 94.7% in 15 subjects with a history of advanced periodontitis who were maintained and treated periodontally before implants were placed, correlated with a higher incidence of marginal peri-implant bone loss and a higher implant survival rate in the mandible (96.2%) than in the maxilla (93.5%) (Roccuzzo et al., 2010).

Leonhardt et al., also demonstrated a 94.7% success rate in implants placed in the maxilla in comparison to a 96.2% survival in those placed in the mandible at a 10-year follow-up, suggesting a possibility of intraoral location differences. Implant failure (Leonhardt et al., 2002; Mengel and Flores-de-Jacoby, 2005).

Karoussis and colleagues reported peri-implantitis and bone loss > 2 mm more often after 5 years in patients with periodontitis in comparison to periodontally healthy patients (Hardt et al., 2002).

Prophylactic antibiotics are frequently administered prior to placement of implants to minimize the risk of infection. Amoxicillin and clindamycin are commonly prescribed pre- and postoperatively in addition to a chlorhexidine rinse. Studies have shown an increased incidence of infection after implant placement in periodontitis-susceptible individuals (Rosenquist and Grenthe, 1996).

In reviewing the literature, there has been no appropriate scientific evidence to conclude definitively that individuals with a previous history of periodontitis demonstrate increased failure rates when rehabilitated with dental implants. Variables such as whether implants were single units or multiple-unit bridges, and whether placement was immediate or delayed were frequently not reported.

4 Conclusion

Patients with a history of periodontal disease should be informed that there is a higher risk of peri-implant disease. Supportive periodontal therapy seems to be a key factor in enhancing long-term implant survival.

With proper management and patient compliance, clinically acceptable results can be achieved when placing dental implants in patients with a history of periodontitis. Therefore, implant treatment in periodontitis-susceptible patients is predictable and successful treatment option if adequate infection control and an individualized maintenance programme are provided.

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