

COMBINED PERIODONTAL AND IMPLANT TREATMENT OF A CASE OF AGGRESSIVE PERIODONTITIS

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Aggressive periodontitis renders a great challenge to clinicians with regards to treatment and prosthodontic rehabilitation. A compromised remaining dentition and a tendency toward refractory disease make it difficult to establish a treatment plan that renders an adequate long-term prognosis. Although the use of implants has become a common treatment modality, limited data are available on the use of dental implants in patients with aggressive periodontitis, especially for cases necessitating the use of grafting procedures preceding implant placement. In this case report the successful treatment of a patient with aggressive periodontitis by the combined use of periodontal and implant treatment necessitating preceding augmentive procedures is described.

Key Words: aggressive periodontitis; dental implants; bone defects; regeneration; intrabony defects; socket preservation

INTRODUCTION

Characteristics of aggressive periodontitis are rapid progression and destruction of periodontal tissues, often associated with a high risk of disease relapse.¹ A combination of a compromised remaining dentition and the risk of a relapse of the periodontal disease, rendering supporting teeth at a hazard of later loss, makes the appropriate treatment and prosthodontic rehabilitation of patients with aggressive periodontitis challenging. Stabilizing the periodontal disease is difficult but mandatory before any prosthodontic treatment can be performed. Restorations need to be designed in a way that

performance of oral hygiene procedures is not impaired and maintenance treatment is feasible. Additionally, the possibility of further tooth loss needs to be taken into account. Ideally, the prosthodontic restoration should be designed in a way that accommodates this. In this report the treatment of a patient with aggressive periodontitis by the combined use of periodontal and implant treatment is described.

CASE

The patient, a 62-year-old man, had presented in 1999 complaining of severe gingival bleeding, repeated periodontal abscess formation, and oral malodor. Periodontal therapy and a prosthodontic treatment had been performed 8 months previously by his general practitioner. Nevertheless, the patient was under the impression that tooth mobility and oral malodor continued to increase.

CLINICAL EXAMINATION

Teeth 19, 21, and 23 through 26 were missing and had been replaced by a telescopic crown supporting a

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FIGURE 1. Panoramic radiograph; initial examination.

fixed partial denture that was anchored on teeth 18, 20, 22, and 27. Generalized mild to moderate bone loss with localized vertical defects was present radiographically. Pocket probing depths ranged from 6 to 10 mm, and the clinical attachment level was 11 to 13 mm. The gingiva was highly inflamed, and there were localized areas of spontaneous bleeding. Teeth 18, 22, and 31 had bone loss up to the apex, and all molar teeth demonstrated furcation involvement. Deep vertical defects were present on teeth 20 and 27.

Similar to the condition in the mandible, generalized horizontal bone loss with localized vertical defects could be observed in the maxilla. The anterior teeth had pocket-probing depths of 5 to 6 mm, with generalized horizontal bone loss and a localized vertical defect on the mesial of tooth 9.

The left maxillary canine had a 10-mm pocket on the distal aspect and radiographic signs of vertical bone loss down to the apex. Teeth 2, 3, 12, and 15



FIGURE 2. Long-term provisional placed in the maxilla; old restoration in the mandible: Frontal view.

were not salvageable because of the advanced periodontal destruction.

BACTERIAL SAMPLING

Bacterial sampling of the subgingival plaque performed at the deepest sites of the affected teeth and examined via the use of DNS probes revealed an increase in *Actinobacillus actinomycetemcomitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Bacteroides forsythus*, and *Treponema denticola*. The diagnosis of an aggressive periodontitis was made on the basis of the clinical, radiographic, and microbiological findings.

TREATMENT

Treatment phase I

After a complete periodontal examination, impressions of both arches and a bite registration were made. The casts were mounted in an articulator.

Treatment phase II

Teeth 2, 3, 12, and 15 were extracted. The extraction sockets were covered with a nonresorbable PTFE (polytetrafluoroethylene) membrane (Cytoplast Regentex GBR-200, 25 × 30 mm, Oraltronic, Bremen, Germany/ Osteogenics Biomedical Inc, Lubbock, Tex) according to a standard protocol, and a provisional denture was delivered.²

Access surgery was performed in the maxillary anterior region, the teeth were debrided, and the defect on the mesial of tooth 9 was grafted with a composite graft consisting of demineralized bovine bone xenographs (BioOss spongiosa, 0.25 to 1 mm, Geistlich Biomaterials, Wolhusen, Switzerland) and autologous bone in a 70:30 ratio.

All mandibular teeth, including teeth scheduled for later extraction, were scaled and root planed. The patient was placed on an antibiotic regimen consisting of metronidazole 400 mg twice a day (Flagyl 400, Aventis Pharma, Bad Soden, Germany) and amoxicillin 500 mg twice a day (Amoxicillin 500 mg, Ratiopharm, Ulm/Donautal, Germany) for 1 week after scaling and root planing. Five weeks after the surgery the membranes placed in the maxilla were removed, the maxillary teeth were prepared, and a long-term, provisional, telescopic crown-supported denture was delivered.

TABLE

Types of Implants used

Position (No.)	Implant Type
4	Straumann, screw Plus, 4.1 mm, length 10 mm
5	Straumann, screw Plus, 4.1 mm, length 10 mm
12	Straumann, screw Plus, 4.1 mm, length 10 mm
13	Straumann, screw Plus, 4.1 mm, length 10 mm
19	Camlog, root line, 4.30 mm, length 9 mm
22	Camlog, root line, 3.80 mm, length 13 mm
24	Camlog, cylindrical, 3.30 mm, length 13 mm
25	Camlog, cylindrical, 3.30 mm, length 13 mm

Treatment phase III

Tooth 31 was extracted. Tooth 30 was hemisected, the mesial root was removed, and endodontic treatment was performed on the distal root.

Teeth 28 and 29 were treated with access surgery, and the vertical defect on the mesial of tooth 27, as well as the sockets of teeth 31 and 30, were augmented with a composite graft of demineralized bovine bone xenographs and autologous bone, as described above. The augmented sockets were covered with a nonresorbable membrane.

Teeth 18 and 22 were extracted, and the extraction sockets were covered with a nonresorbable membrane, together with the defect in area tooth 20. Additional clasps were added in areas 28 and 29 to the mandibular telescopic crown-supported denture; the telescopic crowns on teeth 20 and 27 could be salvaged. Tooth 29 and the distal root of tooth 30 were prepared, and a long-term, provisional, fixed, partial denture was delivered.

Clindamycin 300 mg twice a day for 6 days was prescribed (Clindamycin 600 mg, Ratiopharm, Ulm/Donautal, Germany). Membranes were removed 5 weeks after placement under local anaesthesia.

Treatment phase IV

Regular recall visits were performed twice a month during the interval between treatment phase III and phase IV. Oral health care instructions were given and subgingival plaque samples were obtained. No elevated level of periodontal pathogens could be detected.

Treatment phase V

Four implants were inserted into the mandible 6 months after the augmentation (see the Table). A 2-stage protocol was followed for the implant placement. To cover the implants a resorbable membrane (Bio-Gide resorbable bilayer membrane, 25 × 25mm,

Geistlich Biomaterials, Wolhusen, Switzerland) was placed and primary closure was achieved.

Treatment phase VI

The patient was referred to an ear, nose, and throat specialist for evaluation of the maxillary sinuses because abnormalities on the radiograph could be observed, as described previously.³ Clinical and computerized tomographic evaluation revealed abnormalities that indicated a possible chronic sinusitis. The following procedures were performed by the ear, nose, and throat specialist: correction of the deviated nasal septum, partial resection of the conchae nasalis, and an endoscopic sinus operation.

A bilateral sinus-lift was performed 5 months after completion of this treatment. A composite graft of autologous spongiosa from the chin region and a demineralized bone derivative in a 30:70 ratio was used as graft material. Four implants were inserted in area teeth 4, 5, 12, and 13 at 4 months after the sinus lift, using a one-stage approach.

Treatment phase VII

During the healing period the same maintenance protocol was implemented as in treatment phase IV. Similar to the findings during the previous maintenance phase, no elevated levels of periodontal pathogens could be found.

Treatment phase VIII

The mandibular dentition was restored with a tooth-implant-supported fixed partial denture. A frenectomy was performed to prevent further gingival recession in the maxillary anterior region by releasing the mechanical pull. The reason for performing this procedure at this advanced stage in the treatment sequence was the patient's unwillingness to undergo the surgery earlier. The patient refused any surgical procedures to cover the recession in the same area.

Two tooth-implant supported fixed partial dentures were delivered in the maxilla. The recessions on teeth 9 and 10 were masked by the use of pink porcelain.

Maintenance phase

After the prosthodontic treatment was completed, a 4-month recall protocol was implemented. During these appointments the periodontal status was evaluated, supra- and subgingival debridement was performed and oral health care instructions were given.

Twice annually the subgingival plaque of the teeth and implants was evaluated for periodontal patho-

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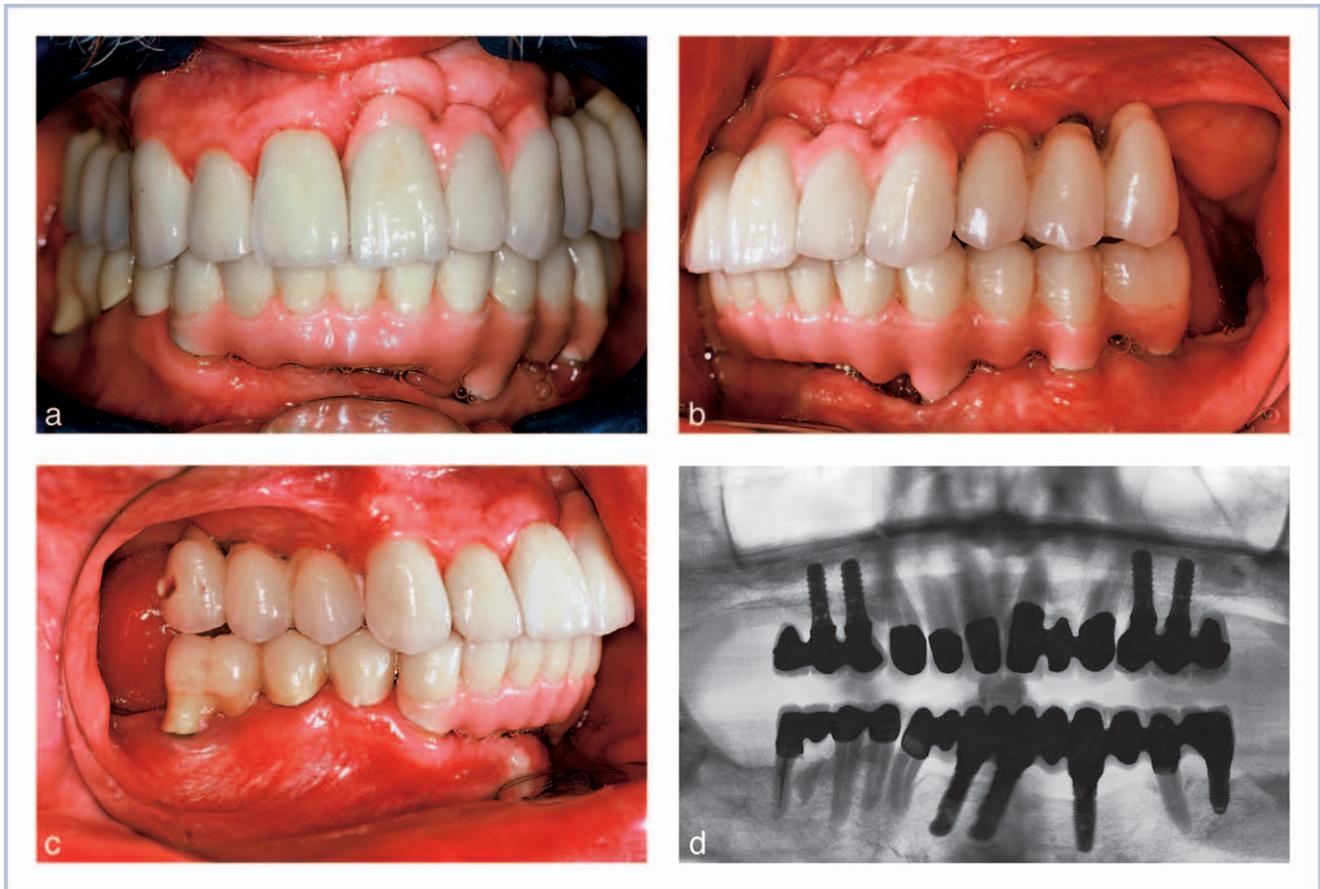


FIGURE 3. Final restoration: (a) frontal view; (b) lateral view, right side; (c) lateral view, left side; (d) panoramic radiograph.

gens. No elevated levels of these pathogens or negative changes in the soft or hard tissues could be detected so far.

DISCUSSION

Aggressive periodontitis is characterized by rapid progression and destruction of periodontal tissues, which is often associated with the early onset of the disease, an elevated degree of therapy resistance, and a high tendency toward relapse.¹

The formerly used terms of "refractory periodontitis," "therapy resistant periodontitis," "rapid progressive periodontitis," and "juvenile periodontitis" are now all summarized under the term "periodontitis" because of their similarity in symptoms and etiology.¹ Underlying defects in the immune response and the presence of specific bacteria have been discussed as etiologic factors.⁴⁻⁷

Although periodontitis is one of the less prevalent types of periodontal diseases, it presents great

challenges in treatment and prosthodontic rehabilitation. The remaining dentition is often too compromised to allow for sufficient retention of fixed or removable partial dentures.

Furthermore, the long-term prognosis of the teeth may be questionable because of a tendency toward relapse of the disease, which often renders teeth questionable for the use as abutments as their long-term prognosis is guarded. Consequently, establishing disease control by periodontal therapy, a tight maintenance schedule, and an adequate prosthodontic treatment plan is of utmost importance in managing these patients.

The use of implants as part of dental rehabilitation has become a common treatment modality that is reliable long term.⁸⁻¹¹ Nevertheless, currently little data are available on the use of dental implants in patients with aggressive periodontitis.

The level and type of periodontal pathogens around dental implants correlate to those found in the remaining dentition of a patient.¹² Despite some data demonstrating that this does not impair the

osseointegration of dental implants, it is possible that implants in patients with aggressive periodontitis are at a higher risk of failure.¹² Similar inflammatory mechanisms of peri-implantitis and aggressive periodontitis have been discussed.¹³ Nevertheless, several studies and case reports have demonstrated the successful use of implants over extended periods in such patients if periodontal disease is controlled.^{14–17}

Similar to these findings, both the periodontal condition around the natural dentition as well as the implants placed were stable over the whole observation period the patient described here. Furthermore, elevated levels of periodontal pathogens around teeth or implants could not be detected.

Only limited data exist so far about the success rate of socket preservation or other augmentation procedures in patients with aggressive periodontitis.¹⁸ The procedures performed in this patient were all uneventful. It is not possible to make statements in regard to the general feasibility of grafting procedures in this patient population overall.

Although additional data with a larger sample size are necessary to validate these findings, the case presented in this article demonstrates that successful placement of implants in patients with aggressive periodontitis is possible and that long-term stability of the implants as well as the natural teeth can be achieved if an adequate maintenance schedule phase is adhered to after the initial treatment.

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