Implant-Supported Full-Mouth Restoration in a Young Patient With Generalized Aggressive Periodontitis

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A 23-year-old female patient was referred to Department of Periodontology, Faculty of Dentistry, University of Istanbul with symptoms of pain, bleeding, and swelling of the gingiva, halitosis, and extensive mobility of teeth. The patient was a nonsmoker and did not present any systemic health problems. Marginal gingiva appeared edematous and extensive bleeding was noted (Figure 1a). Initial clinical evaluation and the panoramic radiography illustrated severe and generalized bone resorption especially around the posterior teeth (Figure 1b). Detailed periodontal examination showed that bleeding and plaque scores were 100% with supra- and subgingival calculus deposition. The probing depths ranged between 4 and 11 mm (Table 1). Multiple teeth presented with extensive mobility and pathological tooth migration was observed on the anterior teeth. The results of blood count, blood glucose, HbA1c, acid and alkaline phosphatase levels were in normal ranges (Table 2). PCR-based (Eppendorf, Mastercycler Personal, Hamburg, Germany) microbial analyses showed the presence of Porphyromonas gingivalis and Treponema denticola in microbial dental plaque. Clinical and radiographical examination and microbial analyses led to the diagnosis of generalized aggressive periodontitis.

Cone beam computerized tomography (NewTom 9000 CBCT, Verona, Italy) was used to analyze the tissue architecture and implant planning (Figure 1c). Initial stage of the therapy included extraction of the unsalvageable teeth, systemic antibiotic therapy (amoxicillin, 500 mg, 125 mg clavulanic acid-3 × 1 + metronidazole, 500 mg-3 × 1; Augmentin, GSK, Gebze, Turkey, and Flagyl, Eczacibasi Rhone Poulenc Pharmaceutical Marketing Co, Istanbul, Turkey), and scaling and root planing (Figure 1d). Detailed oral hygiene instructions were given. Temporary immediate prosthesis were prepared for maxilla and mandible. At this initial stage, we have used a staged extraction approach in order to provide support for the placement of immediate dentures (Figure 1e). Therefore, teeth numbered 17, 15, 28, 38, and 48 were kept even with a minimal bone support.

Definitive treatment plan included fabrication of mandibular and maxillary implant supported-bar retained overdentures. In order to avoid further bone loss after the extractions, we have used a delayed immediate implant placement...
approach. One month after the extractions, 4 implants (Brane-
mark System, MkIII TiU, Nobel Biocare, Göteborg, Sweden) were
placed in maxilla and 4 implants were placed in mandible
anterior at 35 N torque. After 6 months, the healing abutments
were connected and teeth numbered 18, 17, and 15 were
extracted (Figure 2a, b, c). At this stage, provisional dentures
were further modified. For the final construction of the
restorations, individual trays were fabricated and impressions
were taken with polyvinyl siloxane (Affinis, Putty Soft and
Affinis, Regular Body Microsystem, Coltène/Whaledent GmbH +
Co. KG Langenau, Germany) using an open-tray technique. Wax
and metal framework try-in for the maxilla and mandibula were
prepared (Figure 2d, e). In order to improve the esthetic results,
light-cured microfilled composite resin (Gradia Indirect, GC
America Inc, Alsip, Ill) combined with composite gingival
material (GC Gradia Gum, GC America Inc) were used.
Completion of the restorations is shown in Figure 2f and
Figure 2g.
A daily maintenance care was instructed with an interdental
brush (Curaprox Soft Implant Brush CPS 508, Curaden Swiss,
Istanbul, Turkey), superfloss (Curaprox Bridge & Implant Floss
DF844, Curaden Swiss) and a single toothbrush (Curaprox Single
CS 1009, Curaden Swiss). Professional maintenance program was
instituted with periodontal and peri-implant recall visits every 3
months following delivery of the implant supported over-
dentures. Periodontal and peri-implant conditions were stable
over a 24-month follow-up period (Figure 3a, b).

**DISCUSSION**

Aggressive periodontitis presents great challenges in treatment
and prosthodontic rehabilitation. The remaining dentition is
often compromised and prevents sufficient retention of fixed or

### Table 1

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* < 10 mm.
†V indicates vestibule; L, lingual; P, palatine.
removable partial dentures. In GAgP patients, an interdisciplinary approach is essential to evaluate, diagnose, and restore the function and esthetic problems. Such treatment plans require extensive planning and careful execution at every stage utilizing a combination of prosthodontic and periodontic treatments. A close collaboration between dental professionals is critical. Only a few studies\cite{5-9} or case reports\cite{4,10-14} and one review\cite{15} have been published regarding the treatment of patients with aggressive periodontitis using dental implants.

Since there is no consensus on treatment protocols and their long-term outcomes as well as survival of implants placed in such patients, dentists are in general hesitant to use dental implants in GAgP. Host response determines the approach taken by the dental professional during the placement of the dental implants in patients with GAgP. Lang et al suggested that such patients had poor serum antibody response to infective bacterial agents, which negatively affects the progression of the periodontitis\cite{16}. Yet, Mengel et al suggested that partially edentulous patients treated for GAgP can be rehabilitated successfully with osseointegrated implants. The compromise is that the bone and attachment loss around the implants placed in GAgP were higher than in periodontally healthy cases\cite{8} suggesting that the pathogenetic concerns heavily determine the outcomes. Thus, there is a strong need for more evidence towards the understanding of the tissue response to dental implants in GAgP. In this report, we provide support that such cases can be successfully treated using implants when a close collaboration between the periodontist and prosthodontist exist throughout the planning and treatment.

In a similar previous case report, subgingival microbiota was studied before and after complete edentulation and

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<td>Leukocyte</td>
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**Figure 2.** (a, b, c) The healing abutments were connected and teeth numbered 18, 17, and 15 were extracted (clinical-radiographical view). (d, e) Wax framework try-in for the maxilla and mandible. (f) Final prosthesis, (intra-oral). (g) Soft tissue profiles were evaluated in the frontal view, after delivery of the final prosthesis.
reconstruction with dental implants in a 45-year-old female patient with GAgP. At 4- to 6-month recall visits after definitive prosthetic reconstruction, microbiological culture of three inflamed peri-implant sites showed an almost identical spectrum of pathogens, including pathogenic bacteria characteristic of aggressive periodontitis. As natural teeth were absent for 8 months, the authors suggested that periodontal pathogens can be retained for a prolonged period in edentulous areas, from where they can later colonize and compromise the health of dental implants. Since this was the case, we have added antibiotics to the Phase I therapy and preferred a previously reported combination of metronidazole and amoxicillin. This combination has been reported to effectively reduce levels of P. gingivalis, Actinobacillus actinomycetemcomitans serotype b, Tannerella forsythia and T. denticola. Such a combination may be essential for the suppression of the periodontopathogens during the critical healing around dental implants.

Al-Zahrani suggested that clinicians need to consider some other important factors when planning implant placement in GAgP patients: An appropriate length of time between active periodontal therapy and implant placement must be determined. It must also be decided whether to extract all questionable teeth prior to the placement of implants. It is important to ascertain the influence of periodontally compromised teeth on the adjacent implant. Based on these suggestions, we have extracted all the questionable teeth as a part of the treatment prior to the connection of healing abutments. Mandibular third molars were retained since they had a good periodontal prognosis and were not “questionable.” Retention of these teeth also added psychological benefit to her for not being completely edentulous.

The patient in this case is young. Treatment with a removable prosthetics therefore, was considered not an ideal option. The alternative was to restore with the fixed dental prosthesis. However, advanced vertical bone resorption posed esthetic problems, such as inadequate lip support. In order to overcome this limitation, extensive and advanced osseous grafting was necessary. To this end, such surgeries (autogenous bone blocks, synthetic grafts, distraction osteogenesis, etc) could not be performed due to financial limitations. Therefore, we have chosen a compromise by using implant supported overdentures (bar-retained) in order to restore dentition, support lips, and enhance esthetics and phonation. We have used regular diameter implants in this study. Even better results can be obtained if narrow body implants were used based on a recent report that the clinical outcome, survival rate, bone-level changes were shown to be favorable over 5–10 suggesting narrow implants could be used with confidence where a regular diameter implant is not suitable. This finding was further supported in a recent review. Further research is needed if this would be applicable to the GAgP.

GAgP patients require a multidisciplinary approach for the dental treatment to regain appropriate function, aesthetics, and comfort. Dental implants present a viable treatment approach in restoring the lost dentition in subjects with GAgP due to the early loss of teeth at a young age in life. In this case, the restored function and esthetics in a young aggressive periodontitis patient by dental implants was presented. The possibility of a progressive and continuous attachment loss and bone loss occurring around teeth and implants cannot be ruled out and require long-term studies. The key to success is the close collaboration between the periodontist and the prosthodontist. GAgP presents a major challenge for conventional implantology. Therefore, a careful prevention and maintenance regimen is crucial. This starts from the beginning at the planning stage and continues long after the restorations have been placed. In this case, all implants were successful according to the radiographic success criteria reported by Albrektsson et al. While the follow-up time is relatively short, no implants were lost encouraging the use of dental implants in the treatment of patients with GAgP.

**Abbreviation**

GAgP: generalized aggressive periodontitis

**References**

3. Schou S, Holmstrup P, Worthington HV, Esposito M. Outcome of


