A Challenging Mandibular Anterior Implant Case

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Mandibular anterior teeth affected by periodontal disease are often difficult to treat for many reasons. First, the space available for implant treatment and restoration can be restricted. Second, the buccal plate is typically thin, and can be partially or completely missing. Third, the soft tissue is typically either thin and translucent or the mucosa is not keratinized and, in some cases, a mucogingival defect is present along with an aberrant frenulum. Also, after the disease process destroys the alveolar bone and other supporting structures of the dentition, reconstruction of the alveolar ridge is a challenge, meaning that saving the tooth or replacement by an implant is often uncertain. In addition, the presence of periodontal pathogens, which may survive even after extensive treatment, can compromise any restoration efforts.

In spite of these challenges, several authors have restored areas with implants in patients with current or previous periodontal infections and have found that the implants can perform just as successfully as implants placed in periodontally healthy patients. One case report described implant prosthetic treatment of an anterior mandible in a patient with a history of severe periodontitis. Removal of just one tooth was required, and the resultant defect was successfully rebuilt with freeze-dried bone allograft and restored with an implant-supported prosthesis.

The patient in the following clinical case report had suffered from severe periodontal infection that had eroded the bone and periodontal ligaments in the anterior mandible. As can happen with periodontitis, in spite of multiple nonsurgical treatment attempts, the area developed an abscess, and the teeth became nontreatable. The purpose of this article is to demonstrate the successful management of undesirable effects of periodontal infection that caused injury to the supporting tissues in the anterior mandible.

CASE REPORT

Diagnosis and Treatment Planning

A 65-year-old male patient was referred to our office for treatment of a periodontal abscess that had formed while other forms of nonsurgical treatment (such as scaling and root planing, laser therapy, Water Pik [Waterpik], systemic antibiotics, and local antibiotics like Arestin [Valeant Pharmaceuticals]) had failed to resolve the deep pockets associated with the mandibular central incisors (teeth Nos. 24 and 25). Clinical and radiographic evaluation of Nos. 24 and 25 disclosed a missing buccal plate, deep probing (pocket depth of at least 7.0 mm), bleeding on probing, purulent exudate, labial positioning, lack of attached and keratinized soft tissue, and Class III mobility (Figures 1 and 2). Therefore, both teeth were diagnosed as hopeless.

The treatment plan proposed was to include the removal of No. 24 and No. 25, followed by hard- and soft-tissue grafting, CBCT to evaluate the result, and insertion of one narrow-diameter implant to replace the missing teeth. The patient refused extraction of the lateral incisors (Nos. 23 and 26) and replacement with an implant-supported prosthesis as a treatment option in these areas.

Clinical Treatment

The patient was given the following medications prior to his surgical treatment: an antibiotic (clindamycin 150 mg, orally 3 times daily), an analgesic (Motrin 800 mg, 3 times daily as needed), anti-swelling medication (methylprednisolone [Medrol Dosepak]), and chlorhexidine rinse (Acclean 0.12% oral rinse USP [Henry Schein], twice daily).
Vertical incisions were made on the mesial of teeth Nos. 22 and 27 to enable full access to the bony defects and coronal advancement of the flap. A horizontal incision was made with a No. 15 blade (Carbon Steel [Benco Dental]) to enable intrasulcular incisions.

Periodontal flap surgery enabled access to the root and bony defect for diagnosis and treatment. Heavy subgingival calculus was present approaching the apices of the teeth, along with significant bone loss, including the missing buccal plates. Following the removal of Nos. 24 and 25 and degranulation of the necrotic tissues, the defect was grafted with particulate freeze-dried bone allograft (Maxxue Dental Cortical Bone, Ref DN025) and covered with a nonabsorbable titanium-reinforced membrane (Cytoplast [Osteogenics Biomedical]) to rebuild bone both vertically and horizontally (Figures 3 and 4). The patient left our office with a removable partial denture as a provisional prosthesis (Figure 5). Five weeks later, the titanium-reinforced membrane was removed. Since Nos. 24 and 25 did not have attached or keratinized tissue, free gingival grafting was performed 4 months after hard-tissue grafting to ensure that adequate soft tissue would be present around the implant.

By 5 months after extraction and hard-tissue grafting, significant gains in bone height and bone width had been achieved (Figures 6 to 8). This enabled insertion of a 3.2- x 10-mm implant (Legacy 2 Implant System [Implant Direct]) where minimal bone had been present at the time of extraction (Figure 9). The density of the bone at the time of implant placement was type 2.10 Because the mesiodistal space was only about 7 mm, only one implant was planned. The implant was restored 4 months later.

Figures 10 and 11 show the completed case with abundant firm, pink, and keratinized gingiva supporting the implant at 12 months after extraction and grafting.

**DISCUSSION**

In a clinical scenario like this, the restorative dentist faces the challenge of replacing 2 missing teeth with just one implant in an area affected by periodontitis. The interdisciplinary
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The approach in this case involved delicate management of bone and soft tissue, followed by implant surgery in a limited space, and delivery of crowns that met both the patient's and the clinician's demands.

The soft-tissue grafting provided tough, healthy keratinized tissue that would be strong enough to support an implant. The new connective tissue will resist toothbrush and occlusal trauma and prevent gingival recession. Without soft-tissue grafting, the site would have been unstable and poorly suited for loading implants. Around implants, dense and keratinized peri-implant soft tissue has been associated with less bone loss, better tissue health, and improved aesthetics. The influence of soft-tissue thickness on peri-implant marginal bone loss was discussed by Suárez-López Del Amo et al., who suggested that implants placed in areas with initially thicker peri-implant soft tissue have less radiographic marginal bone loss.

Many years of experience with implants have shown them to be a viable option, even in patients with a history of periodontitis. Derks et al. found a slightly higher odds ratio (4.08) for moderate to severe peri-implantitis in patients with a periodontal history; however, odds ratios were much higher (up to 15.08) when 4 or more implants had been placed (regardless of patient periodontal status), making the risk of peri-implantitis in periodontal patients seem negligible in comparison.

Figure 4. (a) The ridge defect was augmented with freeze-dried bone allograft and (b) covered with a titanium-reinforced membrane. (c) The site was secured with polytetrafluoroethylene sutures.

Figure 5. A removable provisional denture was delivered to replace the missing Nos. 24 and 25 during healing.

Figure 6. Left to right: (a) pretreatment, (b) immediately after extraction, (c) immediately after ridge augmentation, and (d) 5 months post-extraction.
CONTINUING EDUCATION

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Although Bakush observed some complications when placing implants in diseased sites, no significant differences were found in success or survival rates for implants placed in diseased versus healthy sites. Courtney et al. conducted a literature review of implants in periodontal patients. They noted that careful ongoing supportive periodontal therapy could result in implant success, even after 5 and 10 years in situ, and concluded that “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.” Kim and Sung also emphasized that diligent maintenance resulted in improved outcomes in implant patients with generalized aggressive periodontitis. Shankar et al. observed less than 3 mm of bone loss and no recurrence of generalized aggressive periodontitis or any suggestive symptoms throughout a 5-year period in one patient, and a patient with non-dental severe health issues was treated successfully by Tizzoni et al. with 6 implants.

CLOSING COMMENTS

The consensus among many researchers is that consistent, diligent maintenance is crucial to the success of implant-supported restorations placed in patients with a history of periodontitis. This necessitates careful patient selection, because patient compliance plays a key role in proper maintenance. In addition, Giannobile and Lang and Tarnow cautioned that clinicians must not be too quick to propose extraction and implant placement, given the excellent long-term track record of successful therapy for tooth preservation. We must avoid the tendency to propose implants for every tooth that has endodontic or restorative problems, since implant complications are on the rise. Tarnow suggests that, in practicing informed consent with our patients, we must always stress the potential for complications, the necessity for excellent patient hygiene, and the requirement for excellent prosthetic design that allows long-term success.

Let’s use our expertise to preserve patients’ functional natural dentition for a lifetime. With good patient management and an interdisciplinary approach, we can offer our patients excellent long-term solutions to the problems they encounter with their natural teeth by providing replacement teeth that mimic their natural dentition.
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References

Figure 10. (a) The definitive implant-supported prosthesis in place at 12 months post-extraction and (b) ridge augmentation.

Figure 11. The patient was very pleased with the outcome. Abundant firm, pink, and keratinized gingiva now supported the implant.
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1. Several authors have restored areas with dental implants in patients with current or previous periodontal infections and have found that the implants can perform just as successfully as implants placed in periodontally healthy patients.
   a. True   b. False

2. In the case presented, as can happen with periodontitis, in spite of multiple nonsurgical treatment attempts, the area developed an abscess, and the teeth became nontreatable.
   a. True   b. False

3. The interdisciplinary approach in this case involved delicate management of bone and soft tissue, followed by implant surgery in a limited space, and delivery of crowns that met both the patient’s and the clinician’s demands.
   a. True   b. False

4. According to this article, Bakush observed no complications when implants were placed in diseased sites.
   a. True   b. False

5. According to the author, clinicians must avoid the tendency to propose implants for every tooth that has endodontic or restorative problems, since implant complications are on the rise.
   a. True   b. False
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