Immediate Loading of Tantalum-Based Implants in Fresh Extraction Sockets in Patient With Sjogren Syndrome: A Case Report and Literature Review

Cristian Peron, DDS,* Fawad Javed, BDS, PhD,† and Georgios E. Romanos, DDS, PhD, Prof. Dr. med. dent.‡

Purpose: The objective of this article is to demonstrate treatment of a clinical case using implants in conjunction with immediate loading in a patient with Sjogren syndrome (SS) and to present the current status of knowledge about this type of patients with dental implants.

Materials and Methods: This article describes a 62-year-old woman patient with SS and partially edentulous maxilla who was rehabilitated with 5 immediately loaded tantalum-based dental implants (TBDIs) placed in fresh extraction sockets. Six nonrestorable teeth were atraumatically extracted and immediate TBDI were placed in the fresh extraction sites. Space between the implants and socket walls were filled with particulate bone graft.

Results: After implant placement, a prefabricated screw-retained provisional restoration was placed and adapted in centric occlusion. The provisional restoration was removed after 2 months and replaced with a full metal/ceramic restoration.

Conclusions: Minimal invasive surgical procedures and temporary immediate restorations are steps particularly important in patients with SS to guide the healing of periimplant tissues and avoid discomfort and complications from removable prostheses. (Implant Dent 2017;26:1–5)

Key Words: immediate loading, Sjogren syndrome, tantalum-based implant

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SS is a chronic systemic autoimmune disease characterized by symptoms, including keratoconjunctivitis sicca (dry eyes), difficulty in speech, swallowing, and mastication, alterations in taste and smell, cracked tongue, burning oral mucosa, rampant caries, sclerosis, or growth of parotid gland, frequent manifestation of candidosis, angular cheilitis, increased plaque retention, and xerostomia.11,12 SS may present as an entity by itself, without an underlying autoimmune condition (primary SS) or may occur in conjunction with other autoimmune disorders, such as Sjogren syndrome (SS) and their management with drugs can affect dental implants and/or the oral tissues supporting them.
as rheumatoid arthritis (RA) and systemic lupus erythematosus (secondary SS). There is no definitive treatment for SS; artificial saliva and lubricants are used to relieve the symptoms. Prevalence rates of SS vary between countries with lowest and highest rates reported from Turkey (0.2%) and Sweden (2.7%), respectively, and is more prevalent in women than in men (9:1 proportion). The diagnosis of SS was made following criteria to the American-European Consensus Group such as many autoantibodies are associated with SS. The frequency of ANA is 80%; then, anti-Ro/SSA and anti-La/SSB are found in 60% and 40%, respectively. According to the American College of Rheumatology classification criteria, the association of ANA and rheumatoid factor positivity may be sufficient for SS diagnosis. The purpose of the present clinical report was to document a case report with a 30-month follow-up clinical and radiographic outcome of the patient are presented in Table 1. The patient had been taking the following medications: (a) corticosteroids (Delta-cortene 25 mg a day for 1 week in active phase) and (b) antihyperglycemic drug (400 mg twice daily) for the treatment of RA and T2DM, respectively, and artificial saliva and lubricants were used to relieve the symptoms of xerostomia.

### Clinical Intraoral and Radiographic Examination

On clinical oral evaluation, maxillary right central incisor (#21/#9†), lateral incisor (#22/#10†), canine (#23/#11†), first premolar (#24/#12†), and second premolar (#25/#13†) were grossly carious (Figs. 1 and 2 (†, World Dental Federation tooth numbering system; †, American Dental Association tooth numbering system). The patient relates the following symptoms such as alteration in taste and smell, cracked tongue, and frequent manifestation of candidosis. Patient with SS presenting different symptoms including the most important that is xerostomia, which causes them to reject wearing conventional removable dentures due to poor retention. The treatment with dental implants is presently the most widely accepted solution. A digital panoramic radiograph (Orthophos XG3; Sirona, Bensheim, Germany) was taken, which showed adequate bone around the aforementioned teeth; however, the carious lesions on all the aforementioned teeth were nonrestorable. Two treatment plans were formulated and explained to the patient. In plan A, extraction of teeth #21 to #25* (#9–#13†) was recommended with replacement of the aforementioned teeth with removable dentures after extraction socket healing. Plan B was similar to plan A, with the exception that the missing dentition would be replaced with immediate TM implants followed by immediate functional loading. Patient accepted plan B and signed a consent form giveaway presenting the most important symptoms that is xerostomia, which causes them to reject wearing conventional removable dentures due to poor retention.

### Table 1. Serological and Autoantibodies Test Examination of the Patient Characterizing the Disease and the Reference Normal Values

<table>
<thead>
<tr>
<th>Examination</th>
<th>Results</th>
<th>Reference Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-AST</td>
<td>84 U/L</td>
<td>1–31</td>
</tr>
<tr>
<td>S-ALT</td>
<td>162 U/L</td>
<td>1–34</td>
</tr>
<tr>
<td>S-GAMMA-GT</td>
<td>51 U/L</td>
<td>1–38</td>
</tr>
<tr>
<td>S-CPK</td>
<td>170 U/L</td>
<td>10–145</td>
</tr>
<tr>
<td>C3</td>
<td>158 mg/dL</td>
<td>90–180</td>
</tr>
<tr>
<td>C4</td>
<td>27 mg/dL</td>
<td>10–40</td>
</tr>
<tr>
<td>Rheumatoid factor</td>
<td>21 UI/mL</td>
<td>&lt;14</td>
</tr>
<tr>
<td>ANA</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Anti-SSA</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Anti-SSB</td>
<td>Positive</td>
<td></td>
</tr>
</tbody>
</table>

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**Fig. 1.** Clinical condition immediately before the extraction of the hopeless teeth in the maxillary arch (left side).

**Fig. 2.** Clinical condition immediately before the extraction of the hopeless teeth in the maxillary arch (left side).

**Fig. 3.** Extraction sockets immediately before grafting and implant placement.

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The patient was premedicated with 2 g amoxicillin plus clavulanic acid 1 hour before the surgery and 2 times daily for 7 days after surgery. Ibuprofen was prescribed for the first 24 hours after surgery. The patient was also instructed to rinse with 0.12% chlorhexidine gluconate mouthwash for 1 minute preoperatively and then 3 times a day for 1 week postoperatively.

Surgical Protocol

The patient was premedicated with 2 g amoxicillin plus clavulanic acid 1 hour before the surgery and 2 times daily for 7 days after surgery. Ibuprofen was prescribed for the first 24 hours after surgery. The patient was also instructed to rinse with 0.12% chlorhexidine gluconate mouthwash for 1 minute preoperatively and then 3 times a day for 1 week postoperatively.

Surgery was performed under local anesthetic (4% articaine with 1:100,000 adrenaline; Inibsa, Lliça Vall, Catalonia, Spain) at the base of the vestibule, in the palate and near the papillae adjacent to the compromised area. All extractions were performed atraumatically using a flapless technique and periotomes and an ultrasonic bone cutting unit (Piezosurgery Mectron s.p.a, Carasco, Italy) followed by sequential drilling. The vertical platform position was 3/4 mm apical to the free gingival margin and palatally. All implants were placed using a torque of 35–40 Ncm. Primary stability was achieved by wrenching the implant into the bone beyond the apex of the socket (Fig. 4). Resonance frequency analysis (Osstell, Gothenburg, Sweden) was performed to determine the implant stability quotient (ISQ) at the time of implant placement and 2 months postoperatively. At the time of implant placement, the value of ISQ was greater than 65 for all implants except for the implant inserted in place of the central tooth with an ISQ of 57. All implants at 2 months showed a higher ISQ including that on the central tooth with a value of 72 confirming the characteristics osteoconductive TM structure with bone ongrowth into the pores. A previously fabricated provisional restoration in acrylic resin was trimmed with diamond burs (Komet, Rock Hill, SC), according to the final contour of the provisional restoration (Fig. 5). Immediately before insertion of the prosthesis, a particulate bone graft material (Copios, Zimmer Dental Inc., Carlsbad, CA) was packed into the gaps between the implant and buccal wall of the socket and extended up to the free gingival margin to help stabilization of the blood clot for initial healing. None of the grafted sites were covered with a membrane. The particulate graft material also served as a scaffold to maintain hard and soft tissue volumes. The restoration was polished with pumice and screwed to the implant using a torque of 20 Ncm. An immediate screw-retained provisional restoration was placed onto the implants exerting the concept of the implant socket healing phase to protect and compress the bone graft and blood clot like a membrane during the healing phase of the treatment. Also, a smooth and a correct form emergence profile of the provisional restoration allows the achievement of a very good healing of the perimplant soft tissues at the time of the final impression. A panoramic radiograph verified the accurate position of implants and prosthesis.
(Fig. 6). The patient was recommended to maintain oral hygiene and glycemic levels on a regular basis. The patient was also enrolled in a biannual oral hygiene maintenance program.

After 2 months of function, the provisional restoration was removed, and a transfer impression was made using a polyether material (Permadiine; 3M Espe, St. Paul, MN) in an open custom tray to capture the subgingival soft tissue profile (Fig. 7). The final porcelain fused to metal crowns were fabricated and cemented onto the abutments. Final occlusal adjustments were made, and the patient was followed up every 6 months up to a total period of 3 years, for clinical and radiographic evaluation of the implants. Instructions regarding oral hygiene maintenance and glycemic control were once again given to the patient.

At 3 years of follow-up, all implants were clinically stable with no clinical evidence of periimplant mucositis and/or suppuration. Panoramic radiographs showed no evidence of periimplant crestal bone loss (CBL) and/or any periimplant radiolucency (Figs. 8 and 9).

**DISCUSSION**

Implant-supported fixed restorations have been recommended for patients with SS to avoid soft tissue reactions from the removable prostheses. To date, there is no evidence in indexed literature about the long-term success of dental implants in patients with SS. However, delayed healing implants in patients with SS have demonstrated CBL without clinical symptoms.17,18,19

The present clinical case report presents long-term results of immediate implants associated with immediate function in a patient with SS. The functional loading of dental implants promotes the bone formation stimulating cell signaling pathways20 and is beneficial for immunocompromised patients, requiring bone grafting procedures.21 It was previously believed that placement of dental implants in patients with diabetes mellitus (DM) should be avoided because of the increased risk of delayed healing, microvascular complications, tissue damage, and infections in these patients.22 However, under optimal glycemic control, dental implants can osseointegrate and remain functionally stable for prolonged durations among patients with DM.23 Moreover, results from a recent clinical study27 demonstrated that mechanical plaque debridement and oral hygiene maintenance play a role in the overall success and survival of dental implant therapy in patients with DM. It is pertinent to mention that strict oral hygiene instructions were given to the patient after implant therapy, and the patient was also advised to maintain her glycemic levels within normal limits. These parameters may also have contributed in stabilizing the TM implants in this patient. In this regard, the role of glycemic control and oral hygiene maintenance with reference to the survival of TM implants in patients with SS cannot be ignored. Further studies with more patients having SS should be performed to give more evidence about implant therapy in patients with systemic rheumatic conditions.

It is well known that tobacco smoking is a significant risk factor for CBL around teeth and implants.24,25 According to Negri et al.,26 tobacco smoking modulates the expression of destructive inflammatory cytokines, such as tumor necrosis factor alpha and matrix metalloproteinases in the periimplant crevicular fluid thereby exposing the periimplant soft and hard tissues to an inflammatory state. It is therefore hypothesized that smokers with SS are at an increased risk of periimplant soft and hard tissue inflammation compared with nonsmoking patients with SS. Further long-term follow-up studies are warranted to test this hypothesis. It is therefore highly emphasized that all patients receiving dental implants (regardless of whether they have systemic conditions or not) should be educated about the detrimental effects of smoking and also about the importance of regular oral hygiene maintenance on their overall health and quality of life.

**CONCLUSIONS**

This case report has a follow-up of 3 years, showing stable periimplant hard and soft tissues. To achieve predictable outcomes with implants placed in fresh extraction sockets in conjunction with immediate loading, the clinical steps that must be respected are as follows: (a) atraumatic tooth extraction, (b) correct implant placement, and (c) placement the bone graft material into the gap between implant and buccal wall protected and held in place by the membrane effect by provisional restoration screwed on the implant. These clinical steps are particularly important for the management of periimplant tissue in this type of patients.

**DISCLOSURE**

The authors claim to have no financial interest, either directly or indirectly, in the products or information listed in the article.

**REFERENCES**


