

# Full-Mouth Rehabilitation Using Dental Implants with Immediate Loading in a Systemic Sclerosis Patient: A Case Report

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## Purpose of the study;

Systemic sclerosis is a rare multisystem autoimmune disease that leads to overproduction and accumulation of collagen, which causes hardening and tightening of the skin and connective tissues. The annual incidence has been estimated to be 19% per million population and often shows more predilections for female compared to male (1:3 ratio). The incidence increases with age, peaking in the third to fifth decade. Dental implant treatment for patients with systemic sclerosis and scleroderma comes with challenges from both treatment aspects: the surgical and prosthetic phases.

Prior to offering this complex and advanced treatment, the patient must be well informed about all aspects of the surgery and other alternative treatment options. The physical limitations in some of these patients should be carefully evaluated, in order to guarantee that the patient could maintain good oral hygiene postoperatively. Home stretching exercises can improve and increase mouth opening. This paper will present a case of systemic sclerosis that was treated with the immediate loading concept using dental implants to rehabilitate both the maxillary and mandibular arches.



Fig. 1. Extraoral frontal view of the patient at repose, smile and profile view at rest



Fig. 2. Intraoral view of the teeth with dental caries



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Academy of Osseointegration

## Treatment Procedure;

A 47-year-old Caucasian female presented at the private practice with a chief complaint that “I have dental infection in my mouth, I can not eat what I want, and I don’t like the way my teeth look. My teeth are very brittle, and they break easily.”

The patient had a significant medical history that includes generalized scleroderma, telangiectasis, pulmonary hypertension, GAVE disease, swollen legs, episodes of shingles, and Raynaud’s phenomenon. Patient fingers were amputated due to lack of blood supply to extremities. Patient reported allergies to latex, Bacitracin, Neosporin, and gold. The patient reported a history of aspiration pneumonia and difficulty waking up after sedation. Extra-oral exam revealed tight shiny skin with limited mouth opening. Intra-oral exam and full mouth radiographic x-rays showed dental caries, infections, multiple restorations with recurrent caries lesions and limited mouth opening (Fig. 1 & 2). Cone Beam Computed Tomography (CBCT) demonstrated sufficient bone for dental implants using the tilted approach to avoid the maxillary sinuses and mandibular alveolar nerves.

Medical consultations were requested from the patient’s primary care physician, pain management doctor, and pulmonologist.

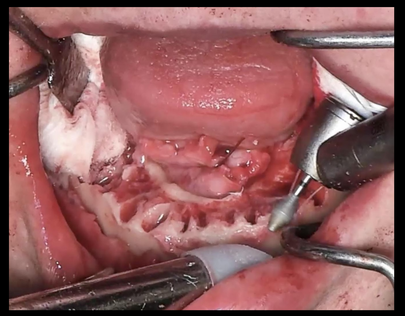
All possible treatment options with the pros and cons of each option were presented to the patient. After a comprehensive exam, it was decided to remove all the remaining teeth, perform full mouth dental implant surgery and immediate loading on the same day by placing four conventional implants for each arch, with two straight anterior implants and two tilted posterior implants for each arch. Maxillary and mandibular immediate dentures were fabricated for conversion and duplicated in clear acrylic to be used as a guide in implant placement and selection of the mini conical abutments (Fig. 3 & 4). The procedure was done under intravenous (IV) moderate sedation due to the patient’s medical history. After making proper sulcular and posterior vertical incisions, full thickness mucoperiosteal flaps were elevated. All teeth were removed and alveoloplasty was performed (Fig. 5). The surgical guide was placed to idealize the amount of bone reduction and the depth of the implant. Implants were placed (Neodent® Helix Grand Morse™, Curitiba, Brazil) in the anterior (straight) and posterior (tilted) regions while avoiding the sinuses on the maxilla and the mental nerves on the mandible (Fig. 6). All implants achieved a torque value of 50 Ncm.



Fig. 3. Immediate denture made for same day conversion and immediate loading



Fig. 4. surgical guide made by duplicating the maxillary denture in clear acrylic



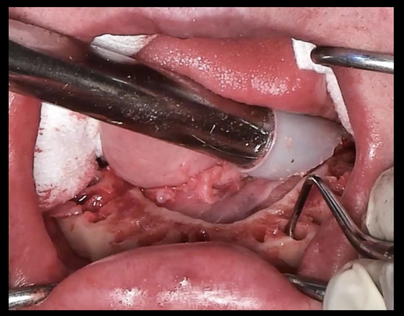


Fig. 5. Alveoloplasty of the mandibular arch after removing the teeth



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## Treatment Procedure;

Surgical stent was used to pick the proper GM™ Mini Conical Abutment (Neodent, Curitiba, Brazil) with proper angulation to be placed into the implants (Fig. 7). After placing the Mini Conical Abutment Protection Cylinders (Neodent, Curitiba, Brazil) on the abutments, the mucosa was closed with continuous chromic gut (3-0) sutures (Surgical Specialties Corp. Westwood, MA, USA ) for the maxilla and Vicryl (3-0) sutures (Ethicon Inc. Somerville, NJ, USA) for the mandible (Fig. 8 & 9). After primary closure of the soft tissue and hemostasis were achieved, patient vitals were monitored until they were within normal limits. Next, the fabrication of the provisional protheses were completed. The immediate maxillary processed denture was tried in and the esthetics were verified and recorded by using a medium bite registration material in the intaglio surface of the denture to capture the implant positions. After picking up the maxillary and mandibular temporary cylinders in the mouth, the prostheses were removed from the mouth and taken to the lab. The lab technician removed the palate, borders, and extensions before filling all voids using a self-cured acrylic. Once the contours of the intaglio surface of prostheses were finalized, they were finished and polished.

The prostheses were put back into the patient's mouth and secured to multiunit abutments using the prosthetic screws. Occlusion was adjusted and the screw access holes were sealed with teflon tape and temporary filling material. A night guard was fabricated to fit the maxillary converted provisional prosthesis. CBCT was taken before patient left the office to check the implants and prostheses. (Fig. 10 ). Instructions for the night guard, including wearing it every night during bedtime, were given verbally and written for the patient's caregiver. The patient was seen at one week and three-week postoperative appointments to evaluate the healing of the surgical sites and make any occlusal adjustments if needed (Fig. 11). Twelve weeks after the surgery, the patient came back for evaluation of healing and osseointegration of dental implants as well as soft tissue healing. Radiographic x-rays were taken of the implants, provisionals were removed, and the implants were percussed, and hand torqued to test and verify successful osseointegration of the implants (Fig. 12). A verification index was made extra-orally using temporary abutments and light cure material. The verification index was sectioned between the implants, placed intra-orally, and then re-luted together using the same light cure material. The lab prescription was written detailing the instructions for the in-house lab. Only minor changes were instructed to be made for the teeth try-in appointment to improve esthetic and function.

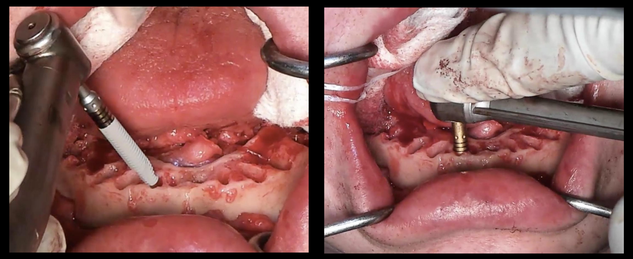


Fig. 6. Implant placement on the mandibular arch

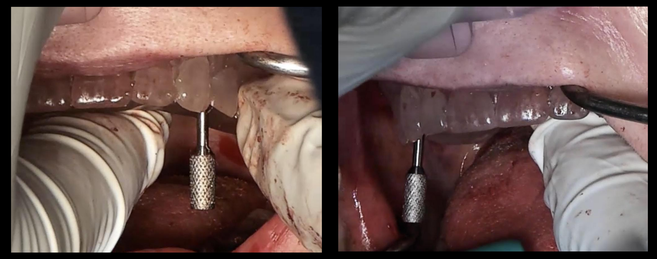


Fig. 7. Using surgical guide to select the proper mini conical abutments with correct angulation

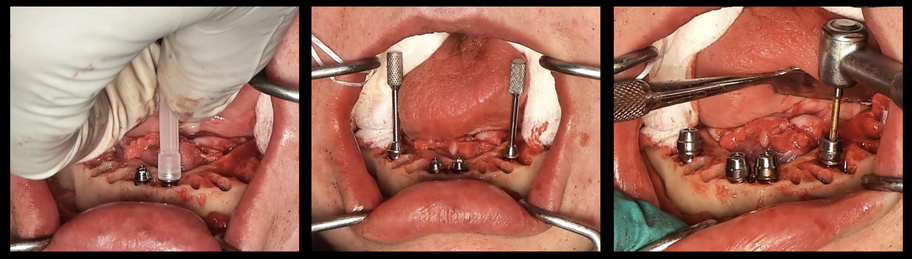


Fig. 8. Placement of the mini conical abutments and protection cylinders on the implants

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## Treatment Results;

On the wax teeth try-in appointment, esthetic, function and occlusion were evaluated. The patient was very satisfied with the changes that were made to the wax up. Once teeth try-in was approved by the patient, the case was ready to be finalized into the final zirconia.

The teeth were scanned in the lab using a lab desktop scanner (S600 Arti, Zikonzahn, Italy) after they were sprayed with scan powder (Denu easy scan, Korea) (Fig. 13), a minor cut back was done to the gingival area to provide restorative space for the layered gingival ceramics. The case was milled using monolithic Zirconia (Blackstone 2, Zirkonzahn SRL, Italy) with the proper shade that was requested by the patient (Fig. 14).

At the delivery appointment, the maxillary and mandibular provisional protheses were removed and the final zirconia prostheses were inserted using new prosthetic screws (Fig. 15). A new night guard was fabricated using the maxillary final prosthesis, which was instructed to be used on a daily basis during night time. Recommended hygiene recall for the patient was determined to be every 3 months due to her medical history and dry mouth. The follow up visit will be as follows: removal of the prostheses, evaluation of the bone level and soft tissue, and cleaning of the mini-conical abutments and protheses.

At 18 months follow up, patient was doing great with no complaint. Implants and mini conical abutments were checked, and they were all stable. Periapical radiographs were taken and bone level around the implants was great (Fig. 16).

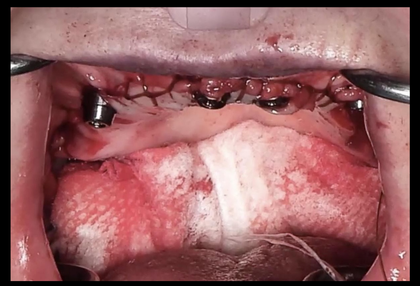


Fig. 9. Continuous Chromic gut sutures to close maxillary flap

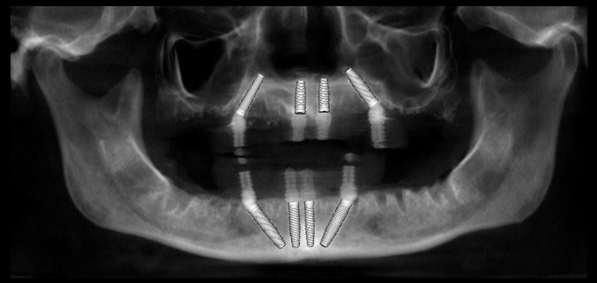


Fig. 10. Post-op panoramic view of implants with temporary cylinders



Fig. 11. Three weeks post-op with provisional acrylic teeth

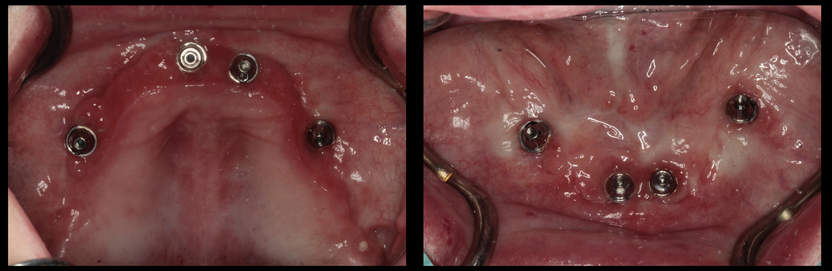


Fig. 12. Maxillary and mandibular healed implants 12 weeks after the surgery. Note the shiny and tight appearance of the soft tissue due to scleroderma



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## Conclusion;

Literature surrounding the success and survival rates of dental implants in patients with scleroderma is limited, with the majority pointing to case reports due to the rare nature of the disease. A systematic review from Strietzel et. al. revealed that between 6 case reports involving scleroderma and implants, the mean implant survival rate was 97.7% after a mean observation period of 37.5 months. Although the low level of evidence is limited generally to case reports, the success of implants in patients with autoimmune disease such as scleroderma is comparable to that of healthy people.

People living with any rare autoimmune disease, are further suffering from a myriad of secondary effects such as xerostomia, enhanced risk of dental caries and periodontal disease, and poor oral hygiene, which all point to an undeniably poorer quality of life. In general, there are few absolute contraindications for dental implants, thus the individual level of disease control, and personal risk-benefit for treatment may be more important. However, in every case, following prosthetic treatment guidelines, implementing frequent recall intervals, close cooperation between the dentist and patient, and a highly motivated patient is extremely important to the success of treatment.



Fig. 13. Maxillary and mandibular wax teeth sprayed with scan powder before scanning



Fig. 14. Final maxillary zirconia teeth before insertion



Fig. 15. Frontal view of the patient with final Maxillary and mandibular Zirconia prostheses

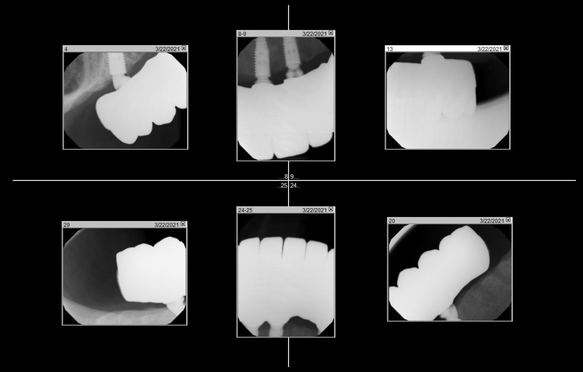


Fig. 16. Periapical xrays 18 months after surgery

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