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Dental Implant CASE REPORT

Complete Rehabilitation of an Advanced Generalized Chronic Periodontitis of a Clinical Situation Using Implant Supported Fixed Prosthesis



Tony Daher, DDS, MSED, FACP, FICD, Prosthodontist

- Diplomate American Board of Prosthodontics
- Private Practice, La Verne, California
- Co-Director of GDIA



Figure 1a,b. a) Frontal view of the clinical situation: Before treatment. b) Occlusal views and the complete mouth radiographs of the before clinical situation.

Background and Purpose

Complete-arch implant-supported restorations are widely accepted as a treatment option for completely edentulous patients and have been documented to have a success rate greater than 90%.¹ Many combinations of materials have been used for these types of restorations such as metal alloy-acrylic, metal alloy-composite, and metal alloy-ceramic. However, prosthesis-related complications with acrylic resin and porcelain-veneered metal frameworks are commonly reported over short- and long-term periods: fracture of the acrylic resin veneer, prosthetic screw loosening/fracture, wear and fracture of resin denture teeth, fracture of prosthesis framework, and poor gingival esthetics and architecture.² Therefore, dentists started to look for

other material options. The evolution of computer-aided design and computer-aided manufacturing (CAD/CAM) systems has allowed the introduction of an alternative restorative approach to the complete-arch implant prosthesis such as Monolithic Zirconia prosthesis. Over the past decade, Zirconia technology has had a significant impact on dentistry because of its biocompatibility, esthetics, and material strength.³ The monolithic nature results in no dissimilar interfaces, and thus minimizes fracture and/or chipping events, creates a greater bulk of material to improve the structural properties of the individual prosthesis, and enables efficient fabrication and care delivery through CAD/CAM manufacturing.^{4,5}



The dental literature lacks data regarding complete arch prostheses fabricated from Zirconia, especially with dental implants as abutments. Clinical case reports have evaluated prostheses with a zirconia frame supported by implants.

The outcomes of these prostheses seem interesting to many prosthodontists.^{6,7} Considering the increased use of Monolithic Zirconia in complete-mouth rehabilitations, the following clinical case presents the clinical and laboratory protocol to fabricate a zirconia full arch prosthesis.

Case Report of an Advanced Chronic Periodontitis

Clinical Data

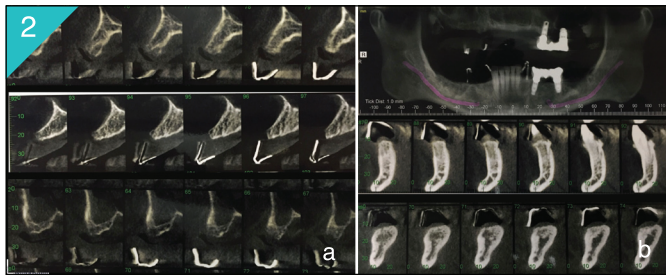


Figure 2a,b. a) CBCT of the clinical situation after the removal of all compromised teeth. b) Showing the radiographic silhouettes of the denture teeth.

A 64 year-old male patient was referred by his general dentist to our prosthodontic practice 2 years ago for a comprehensive treatment plan. His chief complaints were “I have loose upper front teeth; and have mouth odor.” His desires for treatment are: “I want to fix my “mouth” and replace my missing teeth.” “With my new job, I need to look good for my speaking engagements and meetings.” The patient has been receiving sporadic dental treatments during the past 10 years. He stated that the teeth were lost due to extensive decay and gum problems resulting in abscesses requiring extractions.

Medical History

No contributory findings noted except his snoring during sleep.

Clinical Findings / Problem List

Partially edentulous maxilla and mandible. Impacted asymptomatic maxillary left wisdom tooth. Multiple defective existing restorations with recurrent decays. Presence of clinically mobility on maxillary anterior teeth. Advanced chronic Periodontitis and inadequate poor oral hygiene with moderate to severe plaque and calculus. Traumatic occlusion with inadequate occlusal vertical dimension and plane of occlusion.

Overeruption of some of his mandibular anterior teeth. Snoring habit.



Figure 3. Maxillary and mandibular immediate interim overdentures.

Clinical Decision Making and Treatment Plan

After gathering all the clinical data from clinical extraoral and intraoral examination, articulated diagnostic casts using an ear-bow and Gothic Arch tracings, and radiographs; we have presented to the patient in writing the following treatment plan in the following confirmation letter: “This letter will confirm the major elements of our conversation during your last appointment when we discussed the care we plan to provide for you. Because you wanted a more predictable with a long outcome treatment and you have some financial constraints, the following treatments were discussed with you.

1. As you know, your advanced periodontal condition and the excessive severe tooth mobility mandate the removal of any questionable teeth with poor outcome to restore in a predictable manner your mouth. The implants are to be saved but the implant crowns need to be removed due to their severe inclination and they are under the plane of occlusion.
2. I have presented to you 2 options after tooth extraction and we have discussed the benefits of each option:
 - Option 1: 6 implants and fixed bridges supported by implants and this in the upper and lower jaws.
 - Option 2: 4 implants and a removable overdenture on upper jaw and 2 fixed implant bridges on the lower jaw.

You have expressed to us that you wanted the first option. At the end of the treatment we will fabricate a snoring device to address your snoring habit.



Figure 4. Occlusal view of the arches after teeth removal.

Treatment Sequence:

1. Before the removal of all compromised teeth, upper interim immediate denture and lower interim immediate denture were fabricated and placed immediately after teeth removal. The reason of making these dentures before the removal of your teeth is for better healing and esthetic reasons. (Figures 3,4)
2. The placement of implants will depend upon the position of the final denture teeth for the achievement of optimum esthetic and function. Therefore, a CBCT radiographs is made with a radiographic template for a 3D bone evaluation.
3. Then 6 DENTIS™ S-Clean implants are placed. (Figures 5a-c)

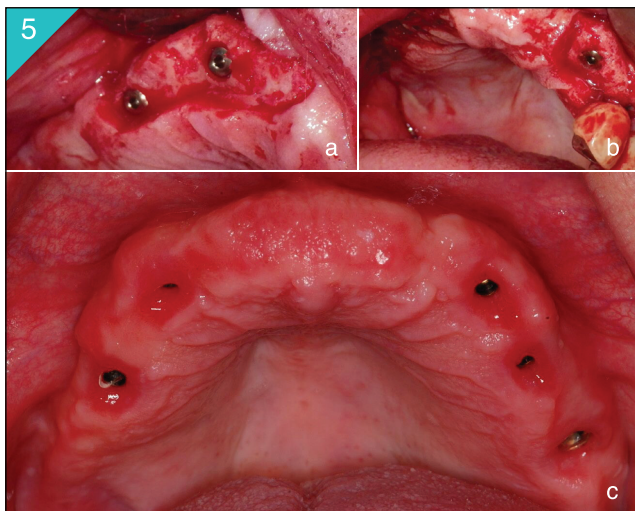


Figure 5a-c. a,b) S-Clean DENTIS™ implants in the maxillary bone. c) The healed maxillary arch with the DENTIS™ implants.

4. After implant integration and the healing is complete, the final fixed prostheses are fabricated. To get a predictable result with the final restorations, it is important to fabricate provisional bridges that will be used for some time. These provisional bridges will be adjusted till the achievement of an acceptable esthetic and functional result. These provisional restorations are the blue print of the final fixed prostheses. (Figure 6 - 14)

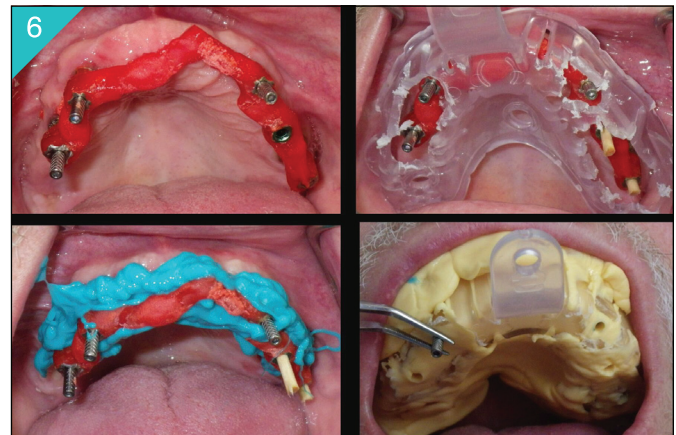


Figure 6. Open Tray maxillary impression. DENTIS™ impression coping are connected with Duralay™ auto polymerizing acrylic resin. Then a putty and wash polyvinyl siloxane impression material are used inside a clear plastic tray to make the final impression.



Figure 7a,b. a) Occlusal view of the second screw retained fixed provisional restorations. b) The smile with the provisional restorations.

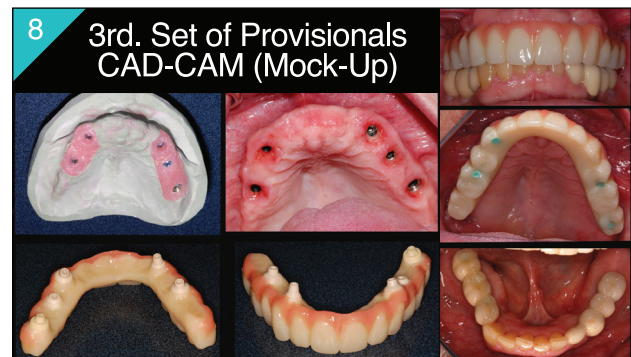


Figure 8a,b. The third PMME CAD-CAM provisional restorations on the casts and in the mouth.

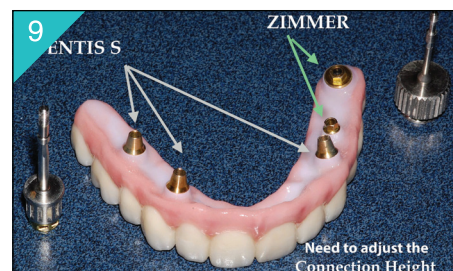


Figure 9. The intaglio view of the final Zirconia screw retained fixed denture showing the 3 conical abutments and the 2 Zimmer hexed abutments. It is necessary to make the conical connection short in the case of misaligned implants.

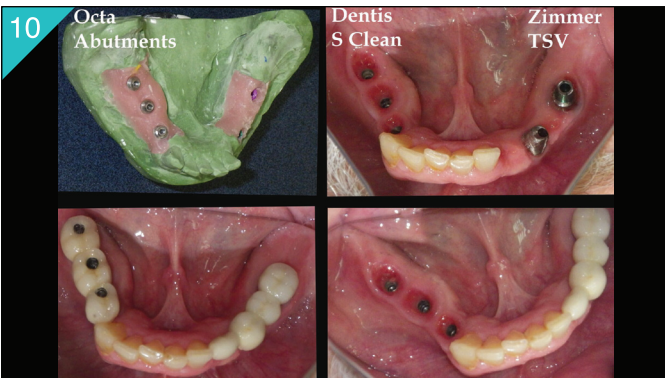


Figure 10. Occlusal view of the mandibular arch.



Figure 11. The lab steps of fabrication of the Zirconia bridge.



Figure 12. Occlusal scheme of the prostheses according to the mandibular movements and the final smile.

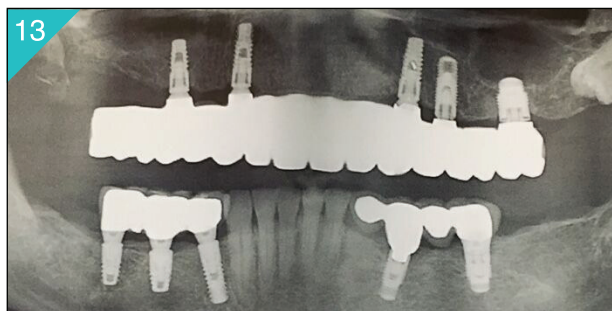


Figure 13. Final panoramic radiograph.

Conclusion

The fabrication of a full-arch implant supported zirconia prosthesis is technique sensitive and should follow the appropriate clinical steps discussed in this case study. The clinician should do a careful patient selection and a thorough planning (location and number of implants, framework design, appropriate occlusal scheme) for a successful and predictable outcome.

This treatment has achieved good function and a pleasing smile. It is worthy to state that complete-arch implant-supported monolithic zirconia fixed dental prostheses may be considered in these scenarios, but long-term clinical performance is still to be assessed.

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