

## Fixed Implant Restoration of the Edentulous Maxilla. A Case Report of a Maxillary Terminal Dentition.



### Tony Daher, DDS, MSED, FACP, FICD.

- Board Certified in Prosthodontics
- Co-Director, GDIA
- Private Practice limited to Prosthodontics and Implant Dentistry
- Private Practice in La Verne, California

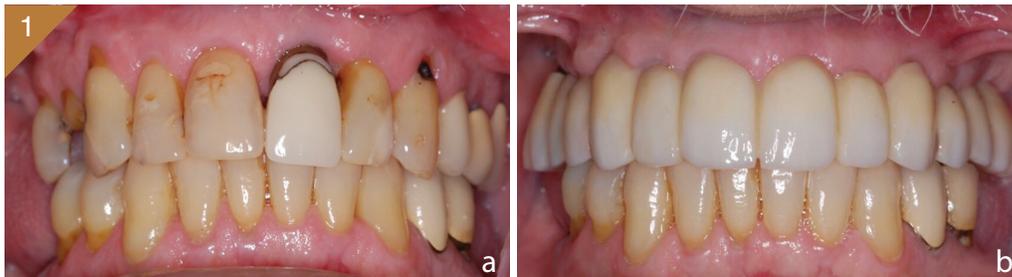


Figure 1a,b. a) Before, b) After.

### Background and Purpose

The restoration of the maxillary terminal dentition continues to be a challenge from surgical and prosthodontic perspectives. Esthetics, phonetics, biomechanics, and hygiene difficulties and complications tend to arise after the completion of such restorations. (Fig. 2)

To get a predictable successful result, considerable efforts must be placed in the diagnosis and treatment planning to ensure that patient's desires and needs are met. When rehabilitating an edentulous maxilla, a decision-making must be established whether a fixed or removable prosthesis would be preferable.<sup>1,2</sup>



Figure 2a-c. Showing when the intaglio surface of the Maxillary Implant Supported Prosthesis is inadequately designed for proper oral hygiene. Plaque and food debris are trapped in and it is impossible to clean with this "saddle" type of intaglio surface design.

Many diagnostic guidelines must be evaluated to come up with an adequate treatment.

These guidelines are: 1) Presence or absence of soft tissue and bone after tooth removal by evaluating the resorption of the maxilla after teeth extraction, 2) The need of a labial flange for an adequate upper lip support, 3) Smile line, 3) Visibility or the lack of the anterior ridge crest with normal smile, 4) Amount of the inter-arch space available, 5) Quantity and quality of available bone in anterior, in premolar, or in molar areas, 6) Decide on the number and position of implants, 7) Treatment time and money needed for the selected final prosthesis, and 8) Psychological factors and Hygiene Factors. Once all these guidelines are analyzed and understood, the end-result is clearly visualized and communicated with the patient and with all treatment providers such as a radiologist, a surgeon, a prosthodontist, and a lab technician.

A study by Colvin et al<sup>3</sup> demonstrated that patient satisfaction was associated with treatment type and how well the dentist explained the intended treatment before performing it.

Over the past decade, Zirconia technology has had a significant impact on dentistry because of its biocompatibility, esthetics, and material strength.<sup>4,5</sup> Considering the increased use of Monolithic Zirconia in complete-mouth rehabilitations, the following case report presents the clinical and laboratory protocol to fabricate a zirconia complete arch prosthesis for a maxillary terminal dentition.

## Case Report of a Maxillary Terminal Dentition

### Clinical Data:

A 66-year-old male patient was referred by his general dentist to our prosthodontic practice for a comprehensive treatment plan. His chief complaints were “I have just been promoted to a new managerial position at work and I have to improve my smile.”

He hoped for a treatment that would fix his “mouth” and replace the broken and decayed teeth. “With my new job, I need to look good because I need to smile while training new employees”, he said. The patient has been receiving sporadic dental treatments during the past 10 years. He stated that he did not take good care of his teeth due to his business at work. Medical history: No contributory findings, only a slight hypertension that he takes medication for.

### Clinical Findings / Problem List:

- Partially edentulous maxilla and mandible
- Multiple defective existing restorations with recurrent decays
- Presence of clinical mobility on maxillary anterior teeth
- Slight chronic Periodontitis and inadequate, poor oral hygiene with moderate plaque and calculus especially noticed at the lingual of the mandibular anterior teeth
- Traumatic occlusion with moderate occlusal wear

### Complete Mouth CBCT Radiographs of Maxillary Existing Dentition: (Figure 4)

A CBCT radiograph survey was made to evaluate boney architecture. This will help in the decision-making on where to place the implants and how many.

### Clinical Decision Making and Treatment Plan:

After gathering all the clinical data (Fig.3,4) from clinical extraoral and intraoral examinations, clinical photos, articulated diagnostic casts using an ear-bow and Gothic arch tracings, and CBCT radiographs; we have formulated a treatment plan taking in consideration the patient's finances and time availability.



Figure 3. Occlusal view of before dental condition.

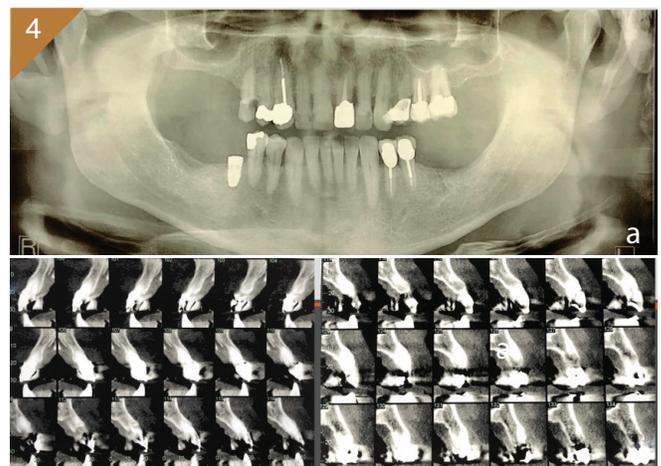


Figure 4a,b. a) Panoramic view b) CBCT radiographic series of bone and teeth evaluation.

A summary of the main clinical visits omitting the post-operative and adjustment visits, is described below:

**1st. Clinical Visit:**

The 2 maxillary left and right canines and the left 1st molar were prepared and will be used as abutments for the first interim fixed bridge. An impression is made and sent to lab to fabricate the first interim fixed bridge after cast-extracting all remaining teeth. (Fig.5,6)



**Figure 5a-c.** Preparation of the 1st set of fixed provisionals. a) Maxillary preliminary cast and the heat vacuum templates for the fabrication of the provisional bridge. b) Clinical photo of tooth preparation of the right and left canines and the 1st left molar. These teeth will be used as abutments for the 1st interim bridge. c) Cast removal of the remaining teeth for the making of the 1st interim bridge.



**Figure 6.** Lab Fabrication of the 1st interim fixed bridge.

**2nd. Clinical Visit:**

All maxillary teeth except right and left canines and the left 1st molar were removed. Then, 7 dental implants in the extraction sockets with their healing abutments were placed immediately. An interim fixed bridge was pre-made in the lab and placed over the prepared teeth and relined over all pontics to conform to the healing abutments and the gingival contour of the extraction sockets. (Fig.7,8,9)



**Figure 7.** Removal of the remaining teeth and immediately placing 7 dental implants.



**Figure 8.** Healing abutments are placed and the interim 1st fixed bridge is cemented over the prepared abutment teeth.



**Figure 9.** 1-month healing with the 1st. interim bridge.

**3rd. Clinical Visit:**

After one month of healing, an open tray impression of the implants is made and sent to lab to fabricate a screw retained interim fixed implant bridge after cast-removal of both canines and the 1st molar. (Fig.10)

**4th. Clinical Visit:**

Placement of the screw retained interim fixed implant bridge and surgical removal of the canines and the 1st molar. (Fig. 10)



**Figure 10.** The 3 remaining abutment teeth are removed, and a screw retained second interim fixed bridge after making an open-tray impression technique.

**5th. Clinical Visit:**

After 2-months of healing, a new open tray impression is made to fabricate a CAD-CAM PMME screw retained provisional bridge with ovate pontics and adequate gingival embrasures around the implants. Dynamic Angulated Screw Abutments (Preat.com) were used for the correction of implant angulations. (Fig. 11,12,13,14)



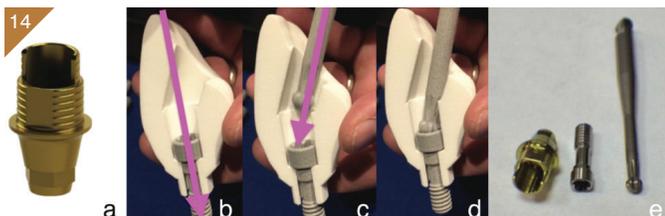
**Figure 11.** A new open-tray impression is made after 1-2 months of healing of the extraction site to make a third CAD-CAM interim fixed bridge to be used as the verified clinical template for the final Zirconia Fixed bridge.



**Figure 12.** Photos of the excellent gingival healing of all the surgical sites and the placement of the CAD-CAM interim 3rd bridge. The abutments used are Dynamic Angulated screw abutments from Preat.com to lingualize the access holes.



**Figure 13.** The 2nd vs. the 3rd interim bridges showing the location of the access holes before and after the use of the Dynamic Angulated Screw Channels (ASC) Abutments from Preat.com.



**Figure 14a-e.** a) The Dynamic Angulated Screw Channels abutment. b,c,d) Dynamic photos of how the access hole is lingualized. e) Photo of the abutment, its screw, and its corresponding special screw driver.

**6th. Clinical Visit:**

After one month of tissue and occlusal adjustment and patient adaptation to the CAD-CAM provisional bridge, a copy of this bridge is sent to the lab for finalizing the final CAD-CAM Zirconia maxillary screw retained fixed bridge. If any gingival recession has happened during the wait period, a pick-up impression is made for the final master cast.

**7th. Clinical Visit:**

Placement and adjustment of the final Zirconia bridge. Oral hygiene and prosthetic instructions are given to the patient. (Fig.15,16)



**Figure 15.** Views of final Maxillary Zirconia Fixed Prosthesis. Please note the ovate shape of all pontics and open adequate gingival embrasures.



**Figure 16.** Frontal view of the complete arch final Zirconia screw retained fixed maxillary prosthesis in centric and in excursive movements.

**8th. Clinical Visit:**

Bridge access openings are sealed and the continuous care schedule is established.

**Conclusion**

The fabrication of a maxillary complete-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 taking in consideration the respect of the esthetics, phonetics, biomechanics, and hygiene principles of such rehabilitation that leads at the end to a successful and predictable outcome. This treatment has achieved good function and a pleasing smile.

**Conflict of interest:**

The author declares no conflict of interests relating to this article.

**Acknowledgment**

Implant Placement was done by Dr. Vahik Paul Meserkhani, prosthodontist and implant surgeon and fellow in the American Academy of Implant Dentistry, Glendale, California.  
 Laboratory Work: Robert Hitti CDT, in-house lab technician.  
 Zirconia and CAD-CAM Works: Spectrum Lab, Santa Ana, California.

**References**

1. Daher T, Goodacre CJ, Sadowski SJ. Implant Overdentures. Chap. 39. 641-664; Fonseca Oral and Maxillofacial Surgery. Elsevier Third Edition.
2. Reshad M, Jivraj S. Fixed Restoration of the Edentulous Maxilla. Chap. 36. 584-604. Fonseca Oral and Maxillofacial Surgery. Elsevier Third Edition.
3. Colvin J et al. Patient expectation and satisfaction with different prosthetic treatment modalities. J Prosthodont 28(2019)264-270.
4. Vagkopoulou T, Koutayas SO, Koidis P, Strub JR. Zirconia in dentistry: part 1. Discovering the nature of an upcoming bio-ceramic. Eur J Esthet Dent 2009;4:130-51.
5. Abdulmajeed, A.A., Lim, K.G., Närhi, T.O., Cooper, L.F., 2016. Complete-arch implant-supported monolithic zirconia fixed dental prostheses: A systematic review. J Prosthet Dent 2015;115, 672-677

Copyright 2019 © Global Dental Implant Academy. All rights reserved.

2 DAYS

HANDS ON

WORKSHOP





## Restoring the Completely Edentulous Patients

📅 August 3-4, 2019    
 📍 La Verne, CA

Register Today!     [WWW.GDIA.COM](http://WWW.GDIA.COM)

