

Case Report

Fabrication of new restorations with a consideration of oral hygiene

Swati Ahuja, Russell Wicks, Audrey Selecman

Department of Prosthodontics, College of Dentistry, University of Tennessee Health Science Center, Memphis, Tennessee, USA

Abstract Maintenance of adequate and effective oral hygiene is crucial for the long-term success of any dental therapy. This article discusses a case that failed due to the poor oral hygiene of the patient. Fabrication of uncomplicated restorations, patient education, motivation, maintenance and recall are important factors to be considered when treatment planning patients with poor oral hygiene.

Key Words: Dental hygiene, maintenance, oral hygiene education

Address for correspondence:

Dr. Swati Ahuja, Department of Prosthodontics, 875 Union Avenue, University of Tennessee Health Science Center, Memphis, Tennessee 38163, USA.
E-mail: sahuja@uthsc.edu

Received: 3rd July, 2014, **Accepted:** 12th December, 2014

INTRODUCTION

The ability and motivation of the patient to maintain good oral hygiene is a key factor affecting the long-term prognosis of a restoration and prevention of biological complications.^[1,2] Inadequate oral hygiene promotes the formation of biofilm causing inflammation of the soft tissue.^[1] Persistent inflammation of the soft tissue results in the spread of infection to the bone causing deterioration of the osseous structures.^[1,3,4] Inflammation and infection in the location of dental implants can lead to loss of osseointegration and failure of the implants.^[1,5,6] In the vicinity of natural teeth, inflammation and infection may result in periodontitis and loss of teeth. The level of patient oral hygiene should be documented and continuously monitored before and during treatment.

Three main causes of poor oral hygiene are: Lack of motivation/awareness of the patient, complicated restorations and poor dexterity of the patient. Patients with lack of motivation/awareness should be educated and encouraged to improve their oral hygiene. It is important for the clinician to demonstrate correct oral hygiene procedures and incorporate oral hygiene devices as per each patient's situation into their oral hygiene regimen. Complicated restorations, such as connected multiunit and/or implant restorations often require additional hygiene techniques. Cagna, *et al.*, have recommended incorporating an electric toothbrush with interchangeable brush heads for cleaning difficult areas associated with complex restorations.^[1] The care givers of patients with poor dexterity should be educated regarding the maintenance of oral hygiene of the patient, as they will be required to perform the daily hygiene regimen.

When planning implant therapy in the edentulous patient, the type and design of the restoration should be selected considering the level of oral hygiene compliance the patient has demonstrated.^[7] The intaglio surface contour and limited accessibility of a fixed implant-supported restoration require skill and time to clean. Removable implant supported restorations can be detached and more readily cleaned by a care-taker or patient with poor dexterity and/or oral

Access this article online	
Quick Response Code:	Website: www.j-ips.org
	DOI: 10.4103/0972-4052.158084

hygiene compliance.^[8] In addition, the choice of attachment is critical to success in the noncompliant patient. Patients with bar supported implant overdentures may develop mucosal hyperplasia beneath the bar and mucositis around the implants.^[9-16] Reduced tissue coverage of unsplinted, free-standing attachments such as Locators (Zest Anchors) or ERA attachments (Sterngold) make them a better treatment choice than connected bars for patients with poor oral hygiene.^[7]

Evaluation of the patient's oral hygiene compliance and motivation is essential to restoration design considerations. Even the most motivated patient requires extensive instruction in techniques and tools to maintain an acceptable level of hygiene. This article details a case report wherein a patient with poor oral hygiene was treatment planned with bar supported overdentures. The patient was not able to maintain hygiene underneath the bar which ultimately resulted in the failure of the restoration.

CASE REPORT

A 60-year-old Caucasian male came to the clinic with the chief complaint: "I am not able to eat and my teeth and implants hurt all the time." Patient was a smoker with extremely poor oral hygiene. The patient presented with an open palate bar supported overdenture in the maxilla retained by six implants which were in service for 8 years. The patient had moved soon after denture delivery and failed to return to any dental practitioner for maintenance and recall.

Diagnostic impressions, intraoral images, and radiographs were made for the patient. Examination of the maxillary arch revealed mucosal hyperplasia and mucositis, gingival to the overdenture bar. The mucosal hyperplasia resulted in the loss of space between the bar and tissue [Figure 1]. The



Figure 1: Mucosal hyperplasia underneath the maxillary bar

mucosa was very tender and inflamed. The radiographic evaluation indicated that the mucositis had extended to the bone resulting in chronic peri-implantitis. Two of the six implants had severe peri-implantitis and were deemed to be in failure. The mandibular teeth were covered with calculus, heavily stained, were affected by caries and severe generalized chronic periodontitis. Patient was aware that his remaining lower teeth were not restorable. Poor oral hygiene was identified as the main causative factor in the degradation of the dental tissues.

The patient was explained in detail that his problems were related to his poor oral hygiene and lack of professional maintenance. Patient was thoroughly educated regarding the importance of adequate and effective oral hygiene on the long-term success of the new restorations. Once the patient committed to maintaining his hygiene and his restorations a treatment plan was formulated for the patient as follows:

For the mandible

- Extraction of mandibular teeth
- Placement of two to four implants in the mandible
- Fabrication of implant supported overdenture for the mandible
- Unsplinted attachments (Locators, Zest Anchors)
- Strict maintenance and recall [Table 1].

For the maxilla

- Removal of hypertrophied tissue underneath the maxillary bar
- Removal of two compromised maxillary implants
- Treatment of remaining maxillary implants
- Unsplinted attachments (Locators, Zest Anchors)
- Fabrication of implant supported overdenture for the maxilla
- Strict maintenance and recall [Table 1].

Patient consented to the treatment. He was referred to the periodontist for removal of the hypertrophied tissue, removal of compromised implants, extraction of all mandibular teeth and for the treatment of remaining implants. The periodontist educated and reemphasized oral hygiene to the

Table 1: Recall schedule for the patient

First recall appointment	Following day of delivery of restorations
Second recall appointment	1-week
Third recall appointment	4 weeks
Fourth recall appointment	3 months
Fifth recall appointment	6 months
Following recall appointments	Biannually

patient. Upon subsequent visits during the treatment phase, patient hygiene compliance was noted by a visible decrease in plaque and inflammation. Once the procedures were performed, the disease was controlled and treated, and the ridges healed the patient was referred back to the author for fabrication of restorations. The remaining four maxillary implants were parallel to each other and were stable. Having factored in the past history of poor oral hygiene of the patient and his desire for an easily maintained restoration it was concluded that the bar supported overdenture was not the optimal restoration for this patient. New maxillary implant overdenture was fabricated for this patient using free standing attachments (Locators, Zest Anchors) following current best practice procedures [Figure 2]. The antero-posterior spread of the implants did not permit an open palate denture.^[17] A complete palate overdenture was fabricated for the patient. Metal framework was incorporated in the denture to permit the reduction of thickness of the denture in the palate, to improve fit and aid in thermal stimulation^[18] [Figure 3]. A transitional restoration (conventional mandibular removable dental prosthesis) was fabricated for the lower arch. The restorations were adjusted as needed and delivered to the

patients. Oral hygiene instructions were given to the patient [Appendix 1] [Figures 4 and 5]. During recall visits, the patient demonstrated adequate ability to clean the abutments, denture bearing tissue and dentures effectively. The patient was pleased with the result [Figure 6] and was recalled regularly [Table 1] to avoid further complications.

CONCLUSION

Patient's ability to perform regular and effective personal oral hygiene impacts the long-term success of therapy. Patients should be educated prior to the commencement of the proposed treatment to avoid future complications. Many restorations present with contours and spaces that are difficult to clean. Patients who are incapable of maintaining optimal oral hygiene should not be restored with such complex restorations.

ACKNOWLEDGMENTS

The authors thank Dr. Vreiti Sangha for providing the periodontal and surgical support.



Figure 2: Individual stud abutments attached to the maxillary implants



Figure 3: Metal framework incorporated in maxillary overdenture



Figure 4: Use of unitufted brush to clean individual attachments



Figure 5: Soft bristle brush used to clean and stimulate denture bearing mucosa



Figure 6: Patient's smile with the new restorations

REFERENCES

1. Cagna DR, Massad JJ, Daher T. Use of a powered toothbrush for hygiene of edentulous implant-supported prostheses. *Compend Contin Educ Dent* 2011;32:84-8.
2. Louropoulou A, Slot DE, Weijden FV. Influence of mechanical instruments on the biocompatibility of titanium dental implants surfaces: A systematic review. *Clin Oral Implants Res* 2014 Mar 19.
3. Berglundh T, Persson L, Klinge B. A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years. *J Clin Periodontol* 2002;29 Suppl 3:197-212.
4. Mombelli A, Lang NP. The diagnosis and treatment of peri-implantitis. *Periodontol* 2000 1998;17:63-76.
5. Leonhardt A, Dahlén G, Renvert S. Five-year clinical, microbiological, and radiological outcome following treatment of peri-implantitis in man. *J Periodontol* 2003;74:1415-22.
6. Quirynen M, De Soete M, van Steenberghe D. Infectious risks for oral implants: A review of the literature. *Clin Oral Implants Res* 2002;13:1-19.
7. Massad JJ, Ahuja S, Cagna D. Implant overdentures: Selections for attachment systems. *Dent Today* 2013;32:128, 130-2.
8. DeBoer J. Edentulous implants: Overdenture versus fixed. *J Prosthet Dent* 1993;69:386-90.
9. Naert I, Quirynen M, Theuniers G, van Steenberghe D. Prosthetic aspects of osseointegrated fixtures supporting overdentures. A 4-year report. *J Prosthet Dent* 1991;65:671-80.
10. Cune MS, de Putter C, Hoogstraten J. Treatment outcome with implant-retained overdentures: Part II – Patient satisfaction and predictability of subjective treatment outcome. *J Prosthet Dent* 1994;72:152-8.
11. Ekfeldt A, Johansson LA, Isaksson S. Implant-supported overdenture therapy: A retrospective study. *Int J Prosthodont* 1997;10:366-74.
12. Engquist B, Bergendal T, Kallus T, Linden U. A retrospective multicenter evaluation of osseointegrated implants supporting overdentures. *Int J Oral Maxillofac Implants* 1988;3:129-34.
13. Parel SM. Implants and overdentures: The osseointegrated approach with conventional and compromised applications. *Int J Oral Maxillofac Implants* 1986;1:93-9.
14. Krennmair G, Ulm C. The symphyseal single-tooth implant for anchorage of a mandibular complete denture in geriatric patients: A clinical report. *Int J Oral Maxillofac Implants* 2001;16:98-104.
15. Watson RM, Jemt T, Chai J, Harnett J, Heath MR, Hutton JE, et al. Prosthodontic treatment, patient response, and the need for maintenance of complete implant-supported overdentures: An appraisal of 5 years of prospective study. *Int J Prosthodont* 1997;10:345-54.
16. Widbom C, Söderfeldt B, Kronström M. A retrospective evaluation of treatments with implant-supported maxillary overdentures. *Clin Implant Dent Relat Res* 2005;7:166-72.
17. Finley JM. Palatal extension of removable prostheses related to implant positions. *Implant Dent* 1998;7:29-33.
18. Rahn AO, Ivanhoe JR, Plummer KD. *Textbook of Complete Dentures*. 6th ed. Shelton, CT, USA: Peoples Medical Publishing House; 2011. p. 10.

How to cite this article: Ahuja S, Wicks R, Selegman A. Fabrication of new restorations with a consideration of oral hygiene. *J Indian Prosthodont Soc* 2016;16:307-10.

Source of Support: Nil, **Conflict of Interest:** None.

Appendix

Appendix 1: Oral hygiene and home care instructions:

- Clean your implant attachments at least twice a day with a unitufted brush (handheld/electric). Ensure cleaning all the surfaces of the implant attachments and the tissues around the implant as thoroughly as possible
- To maintain healthy gums, massage and clean the gums, tongue and roof of the mouth daily with a soft toothbrush for 5 min in the morning and 5 min in the evening
- Dentures MUST be left out of the mouth for at least 7–8 h in a 24 h period
- A stiff denture cleaning brush and diluted dish soap

solution should be used for cleaning the dentures a minimum of 2 times/day. Never use toothpaste or mouth rinse for cleaning the dentures. Commercially produced denture cleaning effervescent tablets may be used as an additional aid for cleaning the dentures. Do not use the hard brush on the attachments. Use a soft bristled brush to gently clean the attachments in the dentures

- To prevent breaking dentures, brush dentures over a towel or a soft mat
- When the dentures are left out of the mouth they should be stored in a denture bath of water. Rinse well in the morning before reinserting.