

Full-mouth rehabilitation of screw-retained maxillary and mandibular hybrid denture

ABSTRACT

Difficulty in eating and speaking, ill-fitting denture, and sore mouth syndrome has been life long among the elderly using dentures. The evolution from conventional denture to implant-supported prosthesis provides these patients normal healthy life with functional and esthetic benefits. An elderly man reported to the Department of Prosthodontics and Oral Implantology of ITS Dental College, Hospital and Research Centre, Greater Noida, with the chief complaint of mobility of upper and lower teeth. After diagnosis and treatment planning, it was decided for immediate implant placement to fabricate a full-mouth implant-supported hybrid prosthesis.

Keywords: Completely edentulous rehabilitation, fixed prosthesis, hybrid denture, implant rehabilitation

INTRODUCTION

Elderly patients seek replacement of lost teeth with the primary sole aim of chewing food followed by esthetics that gets altered due to lost teeth, supporting alveolar bone and muscles.^[1] Treatment options may range from the use of removable conventional denture to the creation of fixed implant-supported restorations and to implant-supported dentures. The treatment choice depends on the patient's anatomical limitations and personal preferences such as cost including the acceptance of extensive surgical procedures to restore the alveolar bone and/or soft tissue.^[2]

Implant-supported overdentures and hybrid prosthesis often provide support to the soft tissues of the face as compared to the traditional fixed prosthesis. When adequate number of implants is placed in an arch, a conventional fixed bridge is the prosthetic modality of choice. However, this is not a treatment option in the maxilla due to combined vertical and horizontal resorption of bone and tilted positions of the implants. Therefore, a conventional fixed bridge would not meet the patient's requirements for hygiene maintenance, esthetics, phonetics, and comfort. In addition, excess of cervical porcelain looks unnatural and also requires more baking cycles, which increases the risk of porcelain

fracture.^[1] Such complications can be resolved by fabricating hybrid prosthesis that can easily replace the soft tissue; on concerning their shock-absorbing properties, it can reduce the mechanical and biological problems, i.e., component fracture, screw loosening, and bone resorption.^[3]


Hybrid prostheses' advantages include decrease in impact force of dynamic occlusal loads, cost-effectiveness, and highly esthetic restorations. Furthermore, they can be successfully used by a combination of tilted and axially placed implants in partial edentulism in the posterior part of resorbed maxillae.^[3] The present article describes the immediate implant placement for the fabrication of maxillary

HARCHINTAN KAUR, VISHWAS BHATIA, MEERA SINGH, ABHIJEET BURAGOHAIN

Department of Prosthodontics and Oral Implantology, ITS Dental College, Hospital and Research Centre, Greater Noida, Uttar Pradesh, India

Address for correspondence: Dr. Harchintan Kaur, Department of Prosthodontics and Oral Implantology, ITS Dental College, Hospital and Research Centre, 47, Knowledge Park-III, Greater Noida - 201 308, Uttar Pradesh, India.
E-mail: dr.harchintankaur21@gmail.com

Received: 02 April 2019, **Revised:** 15 June 2019,
Accepted: 15 September 2019, **Published:** 18 June 2020

Access this article online	
Website: www.njms.in	Quick Response Code 
DOI: 10.4103/njms.NJMS_22_19	

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kaur H, Bhatia V, Singh M, Buragohain A. Full-mouth rehabilitation of screw-retained maxillary and mandibular hybrid denture. *Natl J Maxillofac Surg* 2020;11:146-9.

and mandibular implant-supported hybrid prosthesis using polymethyl methacrylate.^[4]

CASE REPORT

A 58 year old male reported to the Department of Prosthodontics and Oral Implantology, ITS Dental College, Hospital and Research Centre seeking for full-fixed prosthetic oral rehabilitation. The patient had been diagnosed with generalized periodontitis. No relevant medical history was reported. Previous experience with implants in relation to 35 and 37 made the patient opt for fixed denture prosthesis. After clinical and radiological assessments [Figure 1], considering the available bone and labial support, two treatment options had been presented to the patient: implant-supported overdentures or implant-supported hybrid dentures. The former was refused by the patient as the requirement of the patient was fixed prosthesis.

- A through clinical, radiographical, and hematological investigation was done. Postanalyzing the cone-beam computed tomography and hematological investigation, it was planned to restore maxillary and mandibular ridges with multiple implant-supported hybrid prosthesis after extraction of periodontically compromised maxillary and mandibular teeth [Figure 2]. Postadministration of local anesthesia, a full-thickness mucoperiosteal flap was raised
- Eight immediate implants were placed in the maxilla at 11, 13, 15, 17, 23, 24, 26, and 27 whereas four immediate

implants were placed in the mandible at 33, 43, 45, and 47 apart from two already placed implants in relation to 35 and 37. Conventional two-staged approach was followed. Postplacement of implants, the sites were sutured using 3-0 black silk suture. After 10 days, the patient was recalled for suture removal. The crestal mucosal showed no abnormal signs. After 6 months of waiting period, an orthopantomogram [Figure 3] was done to ensure the osseointegration. The second stage surgery under local anesthesia was performed followed by the placement of healing abutments [Figure 4]

- The patient was recalled after 2 weeks; maxillary and mandibular impressions were made using alginate for the fabrication of light-cured custom impression tray for open-tray transfer impression.^[5] The custom tray was verified in the patients' mouth, and open-tray impression copings [Figure 5] were attached to the implants after healing caps were removed [Figure 6]. These copings were splinted with ligature wire with the help of pattern resin^[6] [Figure 7]. Light-bodied addition silicon impression material was injected around the transfer copings, and impression was made using light body and putty addition silicon material^[7] [Figure 8]
- After attaching the implant analogs to the impression transfers, the cast was poured in die stone and the abutments were evaluated for parallelism. The jig trial was verified in the patients' mouth [Figure 9] over two implant sites in the maxillary and mandibular arch, the castable abutments were placed, and a denture base was made.

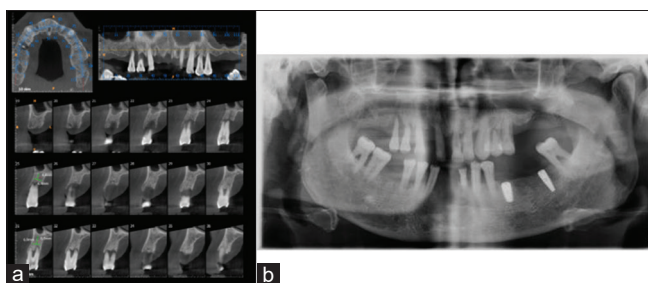


Figure 1: (a) Preoperative cone-beam computed tomography. (b) Preoperative orthopantomogram



Figure 3: Postimplant placement orthopantomogram



Figure 2: Postimplant placement

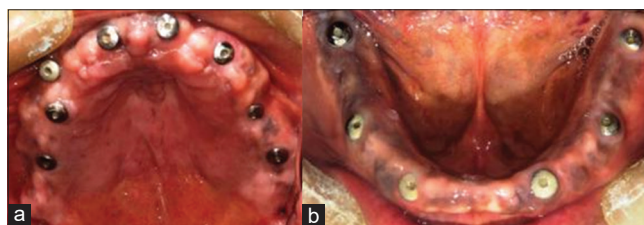


Figure 4: (a) Healing abutments in maxilla. (b) Healing abutments in mandible

The second denture base was fabricated over the first denture base and was snugly fitting due to the elevation incorporated in the first denture base. Occlusal rims were fabricated, and using Niswonger's technique, the jaw relation and tooth selection were recorded [Figure 10]. Casts were mounted on semi-adjustable articulator followed by teeth arrangement with acrylic teeth [Figure 11]. Waxed try-in was done in the patient's mouth. The denture was cured using conventional protocols for complete denture

curing.^[8] This setup helps the technician to fabricate the final restoration

- The maxillary and mandibular hybrid prosthesis were fixed along with implant abutments at sites 11, 13, 15, 17, 21, 23, 24, 27, 33, 35, 37, 43, 45, and 47 through occlusal screws using torque wrench [Figure 12]. Access holes were closed by composite buildup followed by finishing and polishing. Occlusal adjustments were made using articulating paper [Figure 13]
- The patient was given routine postinsertion instructions for maintenance of oral hygiene. The patient was recalled for review first after a month and then after 6 months.



Figure 5: Verification of customized tray



Figure 7: Splinting of open-tray transfer copings



Figure 9: Verification of Jig trial



Figure 6: Soft-tissue contour after removal of healing abutments

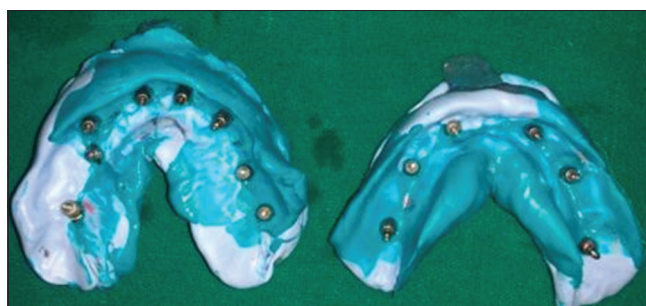


Figure 8: Maxillary and mandibular impressions

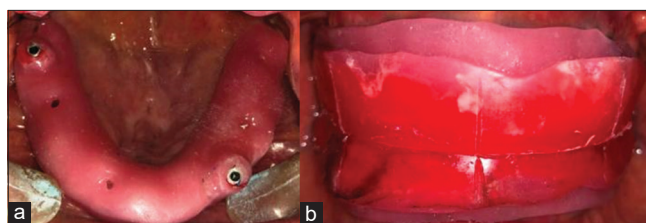


Figure 10: (a) Baseplate engaging castable abutment. (b) Jaw relation was recorded



Figure 11: (a) Articulated Try-in. (b) Try-in in patient's mouth



Figure 12: Hybrid prosthesis with access hole buccally

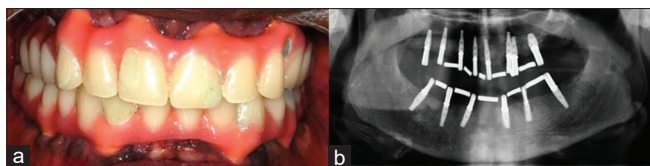


Figure 13: (a) Final Prosthesis. (b) Post-insertion OPG

removable and fixed prostheses. If the placement of sufficient number of implants is feasible, the prosthesis can be totally implant retained.^[9] Rehabilitation of edentulous patients with full-fixed prosthesis has been noticed to achieve greater masticatory function and psychologic satisfaction than with conventional dentures. Occlusal forces following placement of implant-retained prosthesis have been found to have increased considerably.^[10]

CONCLUSION

Each patient has unique treatment needs. Proper diagnosis and treatment plan is important to achieve successful result. A thorough examination, including medical and dental history, orofacial and dental clinical examination, radiographs, impressions, and jaw relation records for mounting casts are crucial steps. Careful integration and sequencing of the different zones of treatment needed enhances the final result. Prosthodontist must consider the advantages and disadvantages of the available implant

prosthetic options which match to the patient's expectations. This article reported on the fabrication of a maxillary and mandibular implant-retained hybrid prosthesis. Occlusion and articulation were found to be good over a period of 1 year. The patient will be on recall for every 6-month review.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Montero J, Macedo de Paula C, Albaladejo A. The "Toronto prosthesis", an appealing method for restoring patients candidates for hybrid overdentures: A case report. *J Clin Exp Dent* 2012;4:e309-12.
2. Steigmann M. Aesthetic flap design for correction of buccal fenestration defects. *Pract Proced Aesthet Dent* 2008;20:487-93.
3. Kwon T, Bain PA, Levin L. Systematic review of short- (5-10 years) and long-term (10 years or more) survival and success of full-arch fixed dental hybrid prostheses and supporting implants. *J Dent* 2014;42:1228-41.
4. Al-Sabbagh M, Kutkut A. Immediate implant placement: Surgical techniques for prevention and management of complications. *Dent Clin North Am* 2015;59:73-95.
5. Castellani D, Basile M. An alternative method for direct custom tray construction using a visible light-cured resin. *J Prosthet Dent* 1997;78:98-101.
6. Lee SJ, Cho SB. Accuracy of five implant impression technique: Effect of splinting materials and methods. *J Adv Prosthodont* 2011;3:177-85.
7. Spector MR, Donovan TE, Nicholls JI. An evaluation of impression techniques for osseointegrated implants. *J Prosthet Dent* 1990;63:444-7.
8. Heintze SD, Zellweger G, Grunert I, Muñoz-Viveros CA, Hagenbuch K. Laboratory methods for evaluating the wear of denture teeth and their correlation with clinical results. *Dent Mater* 2012;28:261-72.
9. Stafford D, Glantz PO, Lindqvist L, Strandman E. Influence of treatment with osseointegrated mandibular bridges on the clinical deformation of maxillary complete dentures. *Swed Dent J Suppl* 1985;28:117-35.
10. Kleis WK, Kämmerer PW, Hartmann S, Al-Nawas B, Wagner W. A comparison of three different attachment systems for mandibular two-implant overdentures: One-year report. *Clin Implant Dent Relat Res* 2010;12:209-18.