

Full mouth rehabilitation of a patient using multiple metal ceramic restorations: A case report

Ashish R. Jain*

ABSTRACT

This clinical case report describes the oral rehabilitation of a young adult female patient using metal ceramic crowns diagnosed with multiple missing teeth, some inadequate, deteriorated, and faulty restorations. The main objective of the treatment was to enhance the esthetics, restore masticatory function, and eliminate the teeth sensitivity. Fixed prosthodontics is used as treatment. Simultaneously, it is necessary to understand that form follows function and that anterior teeth play a key role in the maintenance of oral health. Articulated study casts and a mock wax-up can provide important information for the evaluation of treatment options. Alteration of the vertical dimension of occlusion should be conservative and should not be changed without careful consideration. 1-year recall examination disclosed patient's esthetic and useful expectations were happy, and no pathology was related to the rehabilitation.

KEY WORDS: Full mouth rehabilitation, Gingivectomy, Multiple missing teeth, Porcelain fused to metal crowns, Wax-up

BACKGROUND

Reconstruction of mutilated dentition with missing teeth and worn dentition using fixed or removable prostheses has been a challenge to a dentist's skill and capabilities. Fixed prosthodontics offers exceptional satisfaction for the patient as well as the dentist. It will remodel an unhealthy, unattractive dentition with poor performance into a comfortable, healthy occlusion capable of years of additional service in addition to greatly enhancing esthetics.^[1,2] Several studies have shown that the halftime of comparatively extensive fixed partial dentures with conventional design is around 15 years.^[3-5] For a single tooth replacement, for many years, conventional fixed bridgework was considered to be the best treatment option, and survival of this type of restorations was estimated to be about 75% after 15 years.^[6,7] Various treatment planning modalities can be made for restorations in patients who have lost either maxillary or mandibular posterior teeth, unilaterally, or bilaterally. It has been suggested that compliance improves when the prosthesis meets the esthetic requirements of the patient.^[8] This clinical

case report describes the oral rehabilitation of a young adult female patient using metal ceramic crowns diagnosed with multiple missing teeth.

CASE REPORT

A 23-year-old female diagnosed with multiple missing teeth and faulty restorations presented for prosthodontics treatment. Her primary issues embrace discontentment with the shade of her teeth, poor masticatory potency, and tooth sensitivity. The patient's elaborate medical, dental, and social history failed to reveal any contraindications to dental treatment. Clinical and radiographic examination of the patient showed poorly fabricated metal ceramic crown from maxillary right posteriors to maxillary left anteriors (16-23) two all-metal crowns with supraeruption in the left maxillary posterior region (26,27) [Figure 1].

Cariou lesion with the existing deteriorated amalgam restoration in the maxillary and mandibular posterior teeth (17,44,45,48), and a total of 15 missing teeth in all the quadrants of the mouth (11,12,14,15,21,22,31,32, 36,37,41,42,43,46,47), root canal treated teeth in 13,26,27 with angles Class 1 dental relationship and hypersensitivity [Figure 2].

Access this article online

Website: jprsolutions.info

ISSN: 0975-7619

Research Scholar, Saveetha University, Chennai, Tamil Nadu, India

*Corresponding author: Dr. Ashish R. Jain, Maruthi Dental Clinic, No 436, Mint Street, Sowcarpet, Chennai-600079. Phone: 9884233423, E-mail: dr.ashishjain_r@yahoo.com,

Received on: 12-02-2017; Revised on: 17-04-2018; Accepted on: 09-05-2018

At the age of 18 years of the patient, fabrication of full veneer crowns was done to improve the esthetics of the anterior teeth and mastication, but it is inadequate to satisfy the patient esthetic demands.

TREATMENT OPTIONS

The options bestowed to the patient were removable partial dentures and full mouth rehabilitation with metal ceramic restoration with or without crown lengthening procedure and implant retained replacement of missing teeth. The patient was anxious regarding implant surgery, thus this option was excluded. As there was clinical proof of fractured previous ceramic crowns, full mouth rehabilitation using multiple metal ceramic crowns was planned.

TREATMENT PLANNING

Pretreatment Phase

All the existing metal ceramic and metal crowns were removed. Gingivectomy and gingivoplasty were performed on supraerupted 26 and 27 to improve crown height. Following a dental prophylaxis and oral hygiene instructions, the patient was placed on a 0.12% chlorhexidine gluconate oral rinse to be used twice daily. Diagnostic impressions were made



Figure 1: Initial oral examination. Left lateral, frontal, and right lateral views

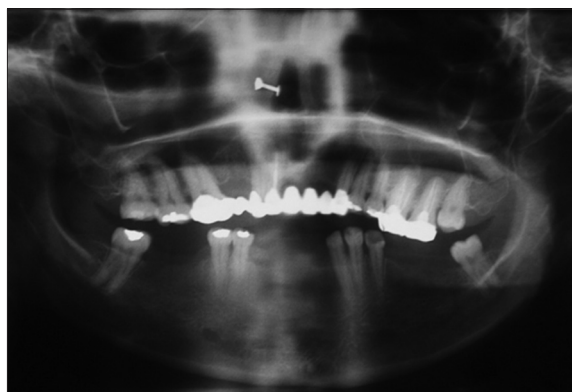


Figure 2: Pre-operative orthopantomograph

with irreversible hydrocolloid impression material, and diagnostic casts [Figure 3] were fabricated from type IV dental stone and mounted on a semi-adjustable articulator (Hanau™ Modular Articulator; Whip Mix Corp., Louisville, USA) using a facebow record and an interocclusal record (EXABITE II; GC Corp., Tokyo, Japan). Diagnostic wax-up was then performed.

DIAGNOSTIC PROVISIONALISATION

Chemical cure acrylic resin (ALIKE™; GC America, ALSIP, USA) provisional crowns were made using a vacuum formed matrix (Drufolen H; Dreve Dentamid GmbH, Unna, Germany) on a cast using indirect technique that was duplicated from the cast with the diagnostic wax-up.

TOOTH PREPARATION

The simultaneous arch technique was employed for rehabilitation. All existing teeth were prepared to accept full veneer metal ceramic restorations with equigingival chamfer margins. The provisional fixed restorations were cemented with temporary cement (Freegenol Temporary Pack; GC Corp., Tokyo, Japan) and esthetics and emergence profile were evaluated [Figure 4].

Interim restorations were observed for 3 months and used as a guide for definitive oral rehabilitation. During this duration, the patient's condition and functions, such as muscle tenderness, discomfort of TMJ, chewing, range of the mandibular motion, swallowing, and speech, were evaluated. Improvement in mastication, speech, and facial esthetics was confirmed by the patient. Bite registration was performed using occlusal registration material -Aluwax [Figure 5].

Permanent impressions were made with addition silicone impression material (Extrude; Kerr Corp.,



Figure 3: Maxillary and mandibular diagnostic models



Figure 4: Luted final provisional restorations

Romulus, Germany). After 1 week, metal trial was done [Figure 6].

Porcelain fused to metal (PFM) restorations were fabricated using a customized anterior guide table, utilizing the duplicated provisional restoration casts, and cemented with resin-modified glass ionomer cement (FujiCEM; GC America, Alsip, USA)^[7] [Figure 7].

The prostheses were designed using mutually protected occlusion. The anterior teeth protected the posterior teeth from excessive force and wear, and the posterior teeth supported the bite force in centric



Figure 5: Bite registration with aluwax



Figure 6: Metal trial



Figure 7: Definitive restorations were luted: Left lateral, frontal, and right lateral view

occlusion. Oral hygiene instruction was given and regular reviews were scheduled. Three reviews were completed in 6 months. The patient did not experience tooth sensitivity or any other complications associated with oral rehabilitation. The patient's esthetic and practical expectations were additionally satisfied.

DISCUSSION

The clinical management of an esthetically demanding, complex practical prosthodontic rehabilitation may be a clinical challenge. Accurate diagnosis, proper treatment planning, prudent choices of materials, and treatment execution are essential for a successful treatment outcome over a long period.^[4,5] Treatment planning in cases of multiple missing teeth is a task that ranges over an extensive period. When discussing an ideal objective to be achieved, it is impossible to take into account the advances in clinical techniques and materials. The financial constraints of the patient kept away the other treatment options such as Lumineers, all ceramic crowns, implant-supported restoration for the missing teeth, and Veneers.

Principles governing the design of PFM restoration: ^[9-20]

1. The occlusal plane was made parallel to interpupillary line.
2. The lips were individually evaluated for symmetry and fullness.
3. The lip position at rest was evaluated for proper lip contact as well as for the range of lip mobility when smiling.
4. The amount of incisal display when the lips and lower jaw are in rest position was limited to 1.91 mm.
5. The dental midline was made to be perpendicular to incisal plane and parallel or coincident to the midline of the face. The midline of the nose, forehead, interpupillary plane, philtrum, and chin is helpful guides to assess the midline of face in relevance to the dental midline.
6. Negative space for the buccal corridor was incorporated to impart depth to the smile.
7. The proportions of the maxillary six anterior teeth were designed according to the principles of golden proportion in dentistry.
8. Good adaptation of the pontic to the ridge ensured there is no air escape through the tissue surface of the pontic while speaking, especially during the production of sibilants causing faulty phonation.
9. Based on previous studies, contact points were established in our case.

CONCLUSION

Full mouth rehabilitation of a mutilated natural tooth is always a prosthodontic challenge. Various restorative

material and treatment options were used for this treatment. Articulated study casts and a diagnostic wax-up can provide important information for the evaluation of treatment options. Prudent clinical judgment and careful balancing of the risks and benefits of different treatment options are essential for a predictable long-term treatment outcome for prosthodontic treatment.

REFERENCES

- Jain AR, Ariga P. Full mouth rehabilitation of a patient having limited interarch space with mandibular implant retained fixed prosthesis fused to metal Fp-1 prosthesis and maxillary acrylic removable conventional complete denture. *Int J Oral Implantol Clin Res* 2013;4:112-7.
- Jain AR, Nallaswamy D, Ariga P, Philip JM. Full mouth rehabilitation of a patient with reduced vertical dimension using multiple metal ceramic restorations. *Contemp Clin Dent* 2013;4:531-5.
- Jain AR, Nallaswamy D, Ariga P, Philip JM. Full mouth rehabilitation of a patient with mandibular implant screw retained Fp-3 prosthesis opposing maxillary acrylic removable over-denture. *Contemp Clin Dent* 2013;4:231-5.
- Jain AR, Janani T. Full mouth rehabilitation of an ectodermal dysplasia patient with hypodontia and reduced vertical dimension using metal ceramic restorations: A case report. *Biol Med (Aligarh)* 2016;8:335.
- Jain AR. Fp1 Prosthesis in maxillary ridge defect and fixed partial denture in mandibular ridge defect - A case report. *Int J Dent Sci Res* 2014;2:184-9.
- Shaw RM. Prosthetic management of hypohidrotic Ectodermal dysplasia with anodontia. Case report. *Aust Dent J* 1990;35:113-6.
- Goepferd SJ, Carroll CE. Hypohidrotic ectodermal dysplasia: A unique approach to esthetic and prosthetic management. *J Am Dent Assoc* 1981;102:867-9.
- Borjian H. The effect of early dental treatment on anhidrotic ectodermal dysplasia. *J Am Dent Assoc* 1960;61:555-9.
- Cruz RA, Almeida MA, Balassiano DF, Campos V. Dental treatment of hydrotic hereditary ectodermal dysplasia. *J Pedod* 1981;5:333-44.
- Bolender CL, Law DB, Austin LB. Prosthodontic treatment of ectodermal dysplasia. A case report. *J Prosthet Dent* 1964;14:317-25.
- Snawder KD. Considerations in dental treatment of children with ectodermal dysplasia. *J Am Dent Assoc* 1976;93:1177-9.
- Turner KA, Missirlan DM. Restoration of the extremely worn dentition. *J Prosthet Dent* 1984;52:467.
- Song MY, Park JM, Park EJ. Full mouth rehabilitation of the patient with severely worn dentition: A case report. *J Adv Prosthodont* 2010;2:106-10.
- Clarke A. Hypohidrotic ectodermal dysplasia. *J Med Genet* 1987;24:659-63.
- Clarke A, Phillips DI, Brown R, Harper PS. Clinical aspects of X-linked hypohidrotic ectodermal dysplasia. *Arch Dis Child* 1987;62:989-96.
- Crawford PJ, Aldred MJ, Clarke A. Clinical and radiographic dental findings in X linked hypohidrotic ectodermal dysplasia. *J Med Genet* 1991;28:181-5.
- Morley J, Eubank J. Macroesthetic elements of smile design. *J Am Dent Assoc* 2001;132:39-45.
- Latta GH. The midline and its relation to anatomic landmarks in the edentulous patient. *J Prosthet Dent* 1988;59:681-3.
- Tjan A, Miller G, The G. Some esthetic factors in a smile. *J Prosthet Dent* 1984;51:24-8.
- Käyser AF. Shortened dental arches and oral function. *J Oral Rehabil* 1981;8:457-62.

Source of support: Nil; Conflict of interest: None Declared