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Lets Do it by Hybrid Way: Rehabilitation of Edentulous Mandibular Arch with Implant Supported Fixed Hybrid Prosthesis- A Case Report

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ABSTRACT

Many people have life-long problems with their dentures, such as difficulties with speaking and eating, loose denture, and sore mouth syndrome. The evolution of dental implant supported prosthesis gives these patients normal healthy life for their functional and esthetic advantages. This case report presents the fabrication of mandibular implant supported screw retained hybrid prosthesis and rehabilitating the mutilated dentition with respect to maxillary arch with metal ceramic restorations.

Key Words: Hybrid Prosthesis, Transmucosal abutments

INTRODUCTION

Dental implants have become increasingly important in oral reconstruction. The high rate of success of rehabilitation with implant-supported prostheses has increased esthetic demands of patients and clinicians.[1] In contrast to the focus on achieving successful osseointegration of dental implants, nowadays obtaining the most natural-looking smiles through preserving the anatomy of the soft tissues or creating them either by tissue regeneration or prosthetic materials is the main concerns of the practitioners. The main objective in implant therapy is either to avoid complete removable dentures by placement of implant-supported fixed prostheses or to improve the retention and stability of removable complete dentures.[2,3] Basically, two approaches for an implant-supported fixed prosthesis exist. The first one is a metal-ceramic implant-supported fixed prosthesis consists of a ceramic layer bonded to a cast metal framework that can be cemented to transmucosal abutments or secured with prosthetic retention screws.[4] An alternative to this type of fixed prosthesis is an implant-supported hybrid prosthesis.[3]

Implant supported metal-acrylic resin complete fixed dental prosthesis, originally referred to as a hybrid prosthesis was introduced to address the problems caused by unstable and uncomfortable mandibular dentures. The primary factor that determines the restoration type is the amount of intra-arch space. In addition, other patient-relevant clinical parameters such as lip support, high maxillary lip line during smiling, a low mandibular lip line during a speech or the patient's greater esthetic demands should be evaluated. Hybrid prostheses have a great number of advantages including reducing the impact force of dynamic occlusal loads, being less expensive to fabricate and highly esthetic restorations.[3,4,5]

The purpose of this clinical report is to present the clinical experience and positive outcome of implant therapy by means of the implant-supported hybrid prosthesis.

CASE REPORT

A female patient of age 65 years had reported to the outpatient wing of prosthodontic department, with a chief complaint of missing teeth in mandibular arch and unaesthetic maxillary teeth. Patient wanted to have fixed prosthesis w.r.t maxillary and mandibular arch. The medical history was non-contributory. On intraoral examination a fixed bridge with respect to, 13,12,11,21,22,2324 was in bad condition and 32,31,41,42,43 were severely periodontically compromised and were

planned for extraction.[Fig. 1-3] The fixed bridge was removed and tooth preparations were modified, impression was made and temporary bridge was cemented with zinc oxide eugenol cement.

Fig. 1: Preoperative view showing unsthetic bridge w.r.t maxillary anterior teeth

Fig. 2: Preoperative maxillary occlusal view

Fig. 3: Preoperative mandibular occlusal view

1) CBCT scan was done to calculate bone width and length and appropriate sized implants were selected.[Fig. 4-6]

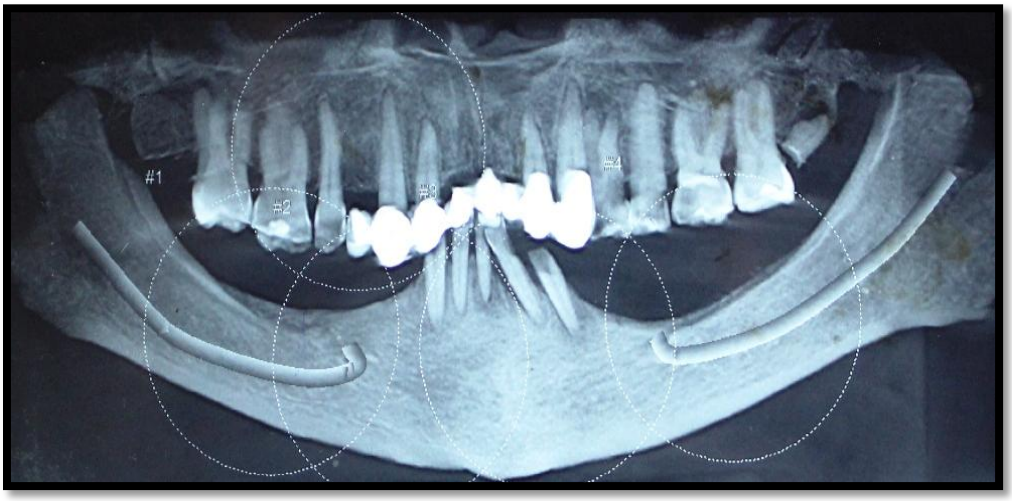

Fig. 4: Pre operative CBCT image

Fig. 5: Pre operative CBCT image with slicing at 1mm distance - right side of the mandible

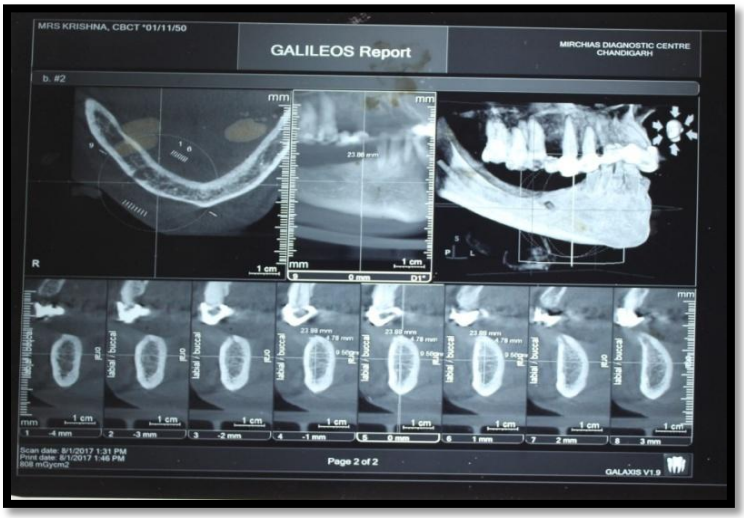

Fig. 6: Pre operative CBCT image with slicings at 1mm distance - left side of the mandible

2)Diagnostic impressions and casts were prepared. Hybrid prosthesis w.r.t mandible was planned. A clear acrylic resin surgical stent was prepared on the diagnostic cast .[Fig. 7]

Fig. 7: Surgical template

3)The mandibular rehabilitation was initiated with implant surgery, which included specific oral surgical procedures. Under local anesthesia, mucoperiosteal flap was reflected [Fig. 8] and with the help of surgical stent, five endosseous implants were placed. [Fig. 9-10] The surgery was uneventful.

Fig. 8: Mucoperiosteal Flap raised

Fig. 9: Implant site drilling using surgical template

Fig. 10: Paralleling guide positioning

4)The healing screws were secured over the implants after evaluation of primary implant stability[Fig. 11] and the mucoperiosteal flap was meticulously sutured. [Fig. 12]

Fig. 11: Implant placement done and cover screw placed

Fig. 12: Mucoperiosteal flap Sutured

5) The maxillary rehabilitation was then followed. Temporary bridge was removed with respect to 13,12,11,21,22,2324. Tooth preparations were done w.r.t 16,15 and 25. Gingival retraction cord was packed and final impression was made with addition silicone elastomeric impression material (putty wash impression). [Fig.13] Impression was poured in type III dental stone.

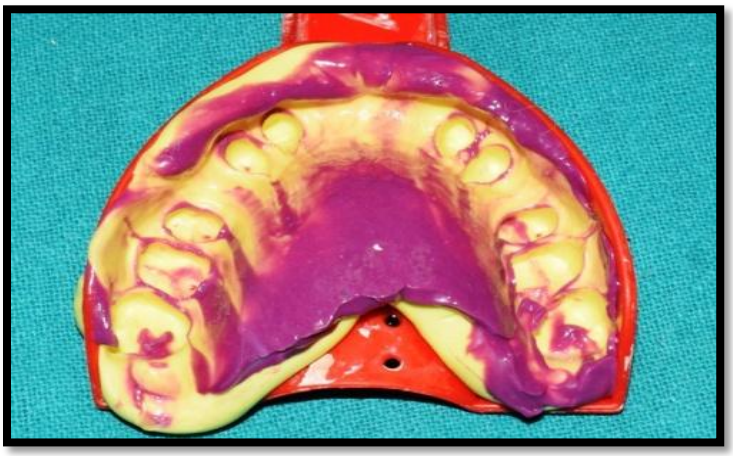

Fig. 13: Secondary impression wrt maxillary arch after tooth preparations

6) Facebow tranfer was done and maxillary cast was mounted on semi adjustable articulator.[Fig. 14] Metal ceramic restorations were fabricated w.r.t 11,12,13,14,15,16,21,22,23,24,25 [Fig.15] and cemented.

Fig. 14: Facebow transfer

Fig. 15: Crown fabrication

7)After 3 months of uneventful healing and radiographic evaluation[Fig.16], the second-stage surgery for the mandible was designed. [Fig. 17-18].

Fig. 16: Post operative OPG after 3 months

Fig. 17: Transmucosal abutments placed during 2nd stage surgery

Fig. 18: Transmucosal abutments removed- showing healthy gingival collar

8)Using a close tray technique, an elastomeric impression (Vinyl polysiloxane Impression material) was made. Implant analogs were attached to the copings in the completed impressions before pouring.[Fig.19] Soft tissue was reproduced in the impression with soft tissue moulage material (Kerr, Orange), and maxillary and mandibular definitive working casts were poured with type III dental stone. The abutments were fixed on the implant analogs in the mandibular cast.

Fig. 19: Impression with analogs attached

9) A verification index for was fabricated with pattern resin (GC pattern resin) connecting the impression copings. The verification index was checked intraorally to confirm the accuracy of the master cast.[Fig.20] Then, the metal frameworks were fabricated in the dental laboratory. They were checked intraorally to confirm their passively seating over the implants.

Fig. 20: Jig trial verified intraorally

10) Occlusal vertical dimension was established and centric relation records were made with customized record bases and occlusal rims.[Fig.21-23] Esthetics and phonetics were used to establish the position of the anterior teeth.

Fig. 21: Customized occlusal rim and record base

Fig. 22 Customized record base screwed intraorally

Fig. 23: Bite registration

11) The teeth arrangement was done over the framework using prefabricated teeth (Ivoclar Vivadent) and evaluated clinically, verifying that the midline, occlusal plane, vertical dimension of occlusion, and centric relation.[Fig.24] Esthetics and phonetics were evaluated, and the patient's acceptance was obtained at the trial insertion appointments. The prostheses was fabricated and adjusted to maintain occlusal point contacts in centric relation and anterior guidance in protrusion and canine guidance in lateral excursions. The prostheses were also fabricated to have slight contact with mucosa to avoid speech difficulties while permitting access for proper hygiene measures.[Fig 25-27]

Fig. 24: Try-in

Fig. 25: Finished hybrid prosthesis on master cast

Fig. 26: Tissue surface of final prosthesis

Fig. 27: Post treatment intraoral view with hybrid prosthesis screwed

12)The patient was explained the importance of maintenance of the implant-supported prosthesis. The use of super floss (Oral-B) and a water jet to clean underneath the prostheses was demonstrated to the patient. The patient was seen after 24 h and minor adjustments were made. The patient was recalled after 1 week, 1, 3, 6 months and 1 year.

DISCUSSION

FImplant supported hybrid prosthesis can provide satisfactory results where esthetic and functional requirements are demanding and challenging, the dentist needs to plan for an alternative treatment procedure that best suits the situation.[3,6,7] The patient's acceptance of the prosthetic treatment plan and restorative solution was certainly promoted by the fabrication of implant supported hybrid prosthesis.

The other important aspect to consider is the maintenance of prosthetic rehabilitation as well as the implants by supporting the structure. Regular checks are recommended every 6 or 12 months to avoid complications and to assess the status of the peri-implant tissue.[3,8,9] Cantilever length is also an important parameter that is to be evaluated when deciding to fabricate implant supported acrylic screw-retained hybrid prosthesis.[8,9,10] The researchers suggested a mandibular extension of between 15 and 20 mm to minimize the risk of framework fracture.[10] Other authors recommended a cantilever length of 1.5 or 2 times of the anterior, posterior curve of the implants.[3,9] Besides, the opposing occlusion and the number and distribution of implants should also be considered, before the determination of cantilever length.[10] Another important aspect to consider when fabricating implant supported fixed complete prosthesis is the framework material. Frameworks are made using a spectrum of metal alloys ranging from conventional high noble to titanium or base metal alloys.[10,11]

CONCLUSION

Implant supported prosthetic rehabilitation of the patients with alveolar bone loss can be facilitated with the use hybrid dentures. Significant improvement in the esthetics, phonetics and masticatory function have increased patient's self confidence.[Fig. 28] There were no complications associated with the hybrid prosthesis during follow ups and the patient satisfaction was extremely high.

Fig. 28: Post treatment extra oral frontal view showing patient's satisfaction

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