

Rejuvenating Function through Implant Supported Overdenture: A Full Mouth Rehabilitation

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ABSTRACT

Aim: To provide a simple overview of diagnosis of complex partial edentulism and management of the same using accurate prosthetic techniques including dental implants for optimum function, comfort, esthetics and longevity of prosthesis.

Summary: Prosthetic rehabilitation of edentulous mouth is a challenging task. The condition is complicated in presence of a resorbed edentulous mandible against irregular maxillary teeth due to increased forces on the prosthesis. Implant supported prosthesis offer an excellent treatment choice along with correct establishment of occlusal harmony for the longevity and comfort for patients. This case report depicts rehabilitation with the help of a implant retained overdenture wherein acceptable function and comfort was achieved.

Keywords: Immediate loading, implant retained overdenture, occlusal rehabilitation

whole system very predictably. Teeth being one component are involved in the functions of mastication, speech and strongly influence appearance. When they are lost, it is a tribute to the skills of dentists and technician to successfully rehabilitate the stomatognathic system.¹ The problems of edentulism and tooth loss are far more encompassing than just a limitation in function. These issues present many psychosocial implications in patients, such as the fear of aging, social inhibition, and diminished self image.²

The challenge of rehabilitating an edentulous condition gets accentuated when few teeth remain in same or opposing arch. The field of play is bordered by the remaining teeth. In such a scenario, thought and concern is required for the edentulous foundation. Dental implants ensure comfort, function and esthetics for the edentulous patients, in meeting most of their demands. Several treatment options with implant have been described for mandibular edentulous patients.³ For many years, osseointegrated implant-supported overdentures have been used in the rehabilitation of the edentulous lower jaw with excellent results.⁴

In this case report two implants were placed in the mandible and O-ring attachments were used to retain the lower complete denture. The upper attrited teeth were treated with porcelain fused to metal crowns at the correct vertical dimension to achieve proper function, esthetics and phonetics.

CASE REPORT

A 55 year old male reported to the department of prosthodontics with complaint of worn upper teeth and broken lower denture. History revealed that the patient had several dentures made previously, all of which broke near the midline and were non-retentive. Extraoral examination revealed loss of muscle support in both upper and lower lips and a reduced vertical dimension of occlusion with the current prosthesis (Fig.1). Intraoral examination showed severe irregular attrition of upper teeth till middle third of crown. Supraeruption of the maxillary posterior teeth resulted in reverse canting of the occlusal plane. The mandibular edentulous ridge showed class-4 resorption.

Further examination revealed that the lower complete denture was fractured distal to the central incisor, artificial teeth were

INTRODUCTION

Stomatognathic system is a complex integration of various components and teeth are an integral part that affects the



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Figure 1: Pre-Operative Extra Oral Frontal View

attrited and the resorption was more on the left side of the arch [Fig. 2 (a) and (b)]. After complete examination, the patient was given a detailed explanation concerning the present state, procedures and alternative treatment plans and an informed consent was obtained from the patient. Plan considered for the patient was complete reconstruction of occlusion with fixed restorations for the upper teeth restoring the occlusal plane against an implant retained lower denture using two implants with O ring attachments. The whole treatment plan was categorized into following sections; Pre surgical phase, Surgical phase, and Post-surgical phase.

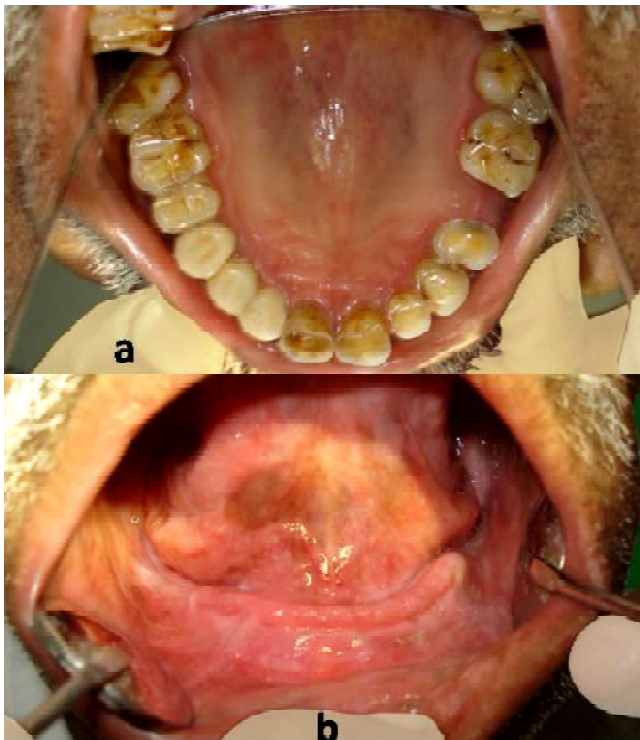


Figure 2: Intraoral Occlusal View (a) Maxillary Arch (b) Mandibular Arch

Pre surgical phase: After obtaining primary casts for upper and lower arches, final impression was made for lower edentulous arch and cast poured. Face bow transfer was made and the casts were articulated in centric relation (Fig. 3). The protrusive and lateral records were taken using zinc oxide eugenol paste and the articulator was adjusted. The lower

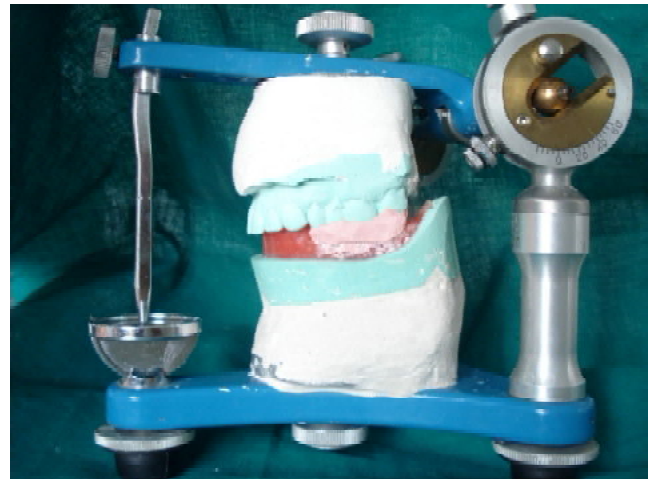


Figure 3: Facebow transfer and centric bite registration.

teeth arrangement was done using extra and intraoral landmarks and the maxillary teeth were waxed up against the lower teeth in the cusp fosse relationship and bilaterally balanced occlusion was developed [(Fig. 4(a) and (b)]. Putty index was taken for the waxed up maxillary teeth. Tooth preparations were done in sextants for porcelain fused to metal prosthesis starting with anterior teeth. Temporary



Figure 4 (a) & 4 (b) Diagnostic waxup of upper teeth followed by arrangement of lower teeth in bilaterally balanced occlusion

crowns were fabricated in tooth colored acrylic using the putty index. The crowns were tried in the mouth and adjusted for esthetics and phonetics for establishment of anterior guidance. Once satisfied with anterior temporaries, an irreversible impression was made and cast poured. The cast served as reference for fabrication of anterior metal ceramic crowns. Similar procedure was carried out for the posterior teeth and final restorations were cemented (Fig. 5). The denture was hence fabricated against the final cast of the restorations.



Figure 5: Try in of the denture after final cementation of upper crowns

A Cone Beam Computed Tomography (CBCT) of the patient was taken. Radiographic evaluation of surgical site in terms of bone volume, density and height and distance from mental foramen was calculated. The trabecular pattern of the bone was assessed to predict density. The implant height and diameter was subsequently planned [Fig. 6 (a),(b), and (c)].

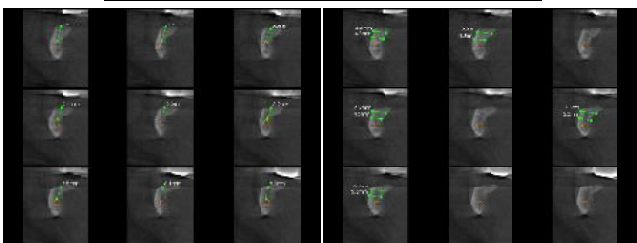
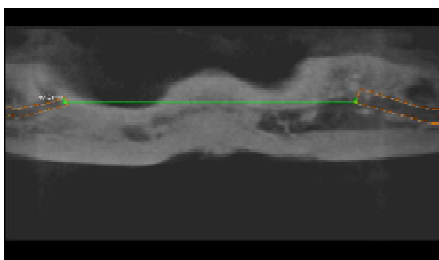


Figure 6 a, b, c: Height, width and interforamen distance of the bone assessed using CBCT.

The denture was duplicated using clear acrylic to create a surgical guide for accurate implant placement (Fig. 7(a)).

Surgical protocol: A two stage procedure for implant

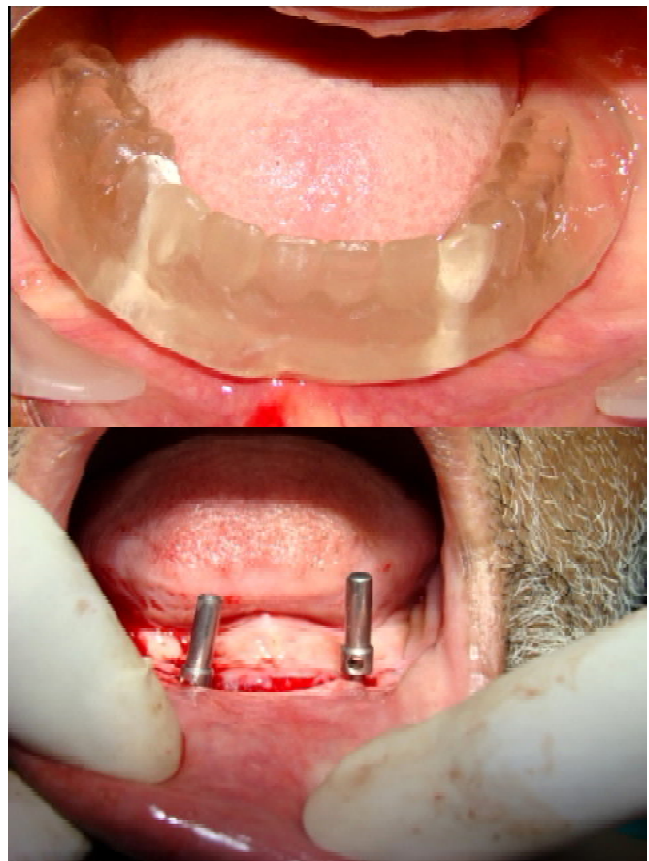


Figure 7 a: Surgical guide made of clear acrylic. **Figure 7 b:** Implants placed

placement was decided. Following application of local anaesthesia, crestal incision was given and a full thickness mucoperiosteal flap was reflected. The surgical guide was used for the placement of the implants. The implants were placed at position B and D i.e, 6 mm away on either side of the midline [Fig 7(b)]. The gingival formers were placed and allowed to heal for 3 to 4 months before loading.

Post-surgical phase: One week after the surgery, the patient was recalled and sutures were resected (Fig. 8). The dentures



Figure 8: Implants at B and D Positions with gingival formers (2 weeks postoperatively)

were relieved in the area of gingival formers and chairside reliner was used to fill the relief holes and dentures placed in mouth in centric occlusion. Once set, the denture was removed and excess soft liner was trimmed and finished. The patient was given oral hygiene instructions and recalled after 3 months. On recall, the implants and surrounding soft tissues were assessed clinically. Radiographic assessment of the implant bone interface was done (Fig 9). The plastic ball caps and stainless steel ball housing was placed on the attachments (Fig. 10(a) and (b)).

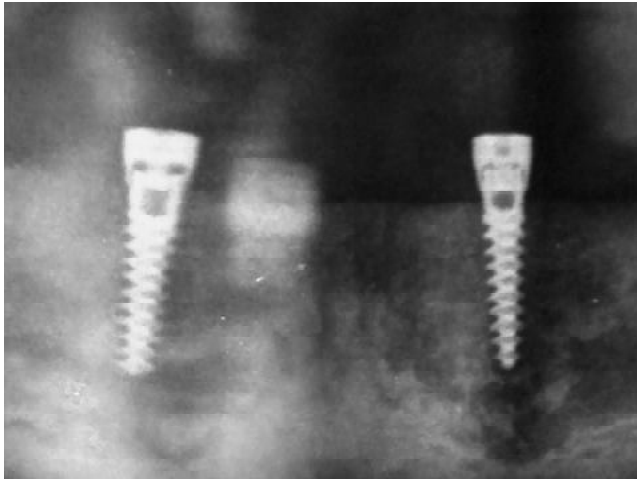


Figure 9: Implants as seen after 12 weeks of placement

The tissue surfaces of the denture against the ball caps were trimmed to completely accommodate the attachments. Once confirmed, autopolymerizing resin was used to attach the ball housing to the denture. The head of each implant is shaped like a ball and the retaining fixture acts like a socket. The O-ring snaps over the ball when the denture is seated and holds the denture at a predetermined level of force. The denture was gently removed; excess was trimmed and polished (Fig. 11).



Figure 11: Final denture with the silicon housing retained in acrylic

Final denture was seated and patient was informed to keep the denture in place for the first 48 hours after placement to prevent tissue overgrowth. The patient was recalled to assess tissue condition and occlusion. Oral hygiene instructions were again reinforced to the patient (Fig 12(a), (b) and (13))

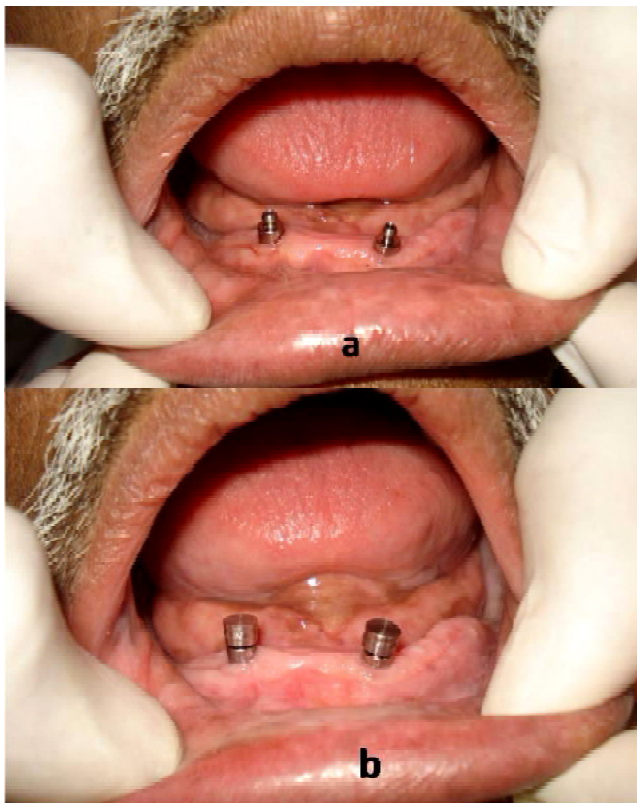


Figure 10: (a) O-Ring attachments in place (b) Metal (Stainless Steel Ball Housing) Housing Over O-Ring



Figure 12: (a) Final Restorations of Maxillary Teeth-Metal Ceramic Crowns and implant retained denture

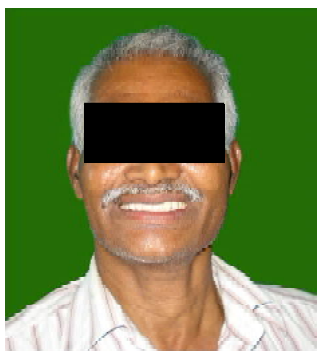


Figure 13: Post Operative Extraoral Frontal View

DISCUSSION

Rehabilitating partial edentulism is a more challenging than completely edentulous cases. The problem is even more complicated when treating single edentulous arches. The problems generally elicited by a complete denture patients, include discomfort, poor fit and retention, soreness and pain especially with mandibular dentures. An over denture is sometimes successfully used. The advantages of implant supported over dentures include: psychological benefits such as satisfaction and oral health related quality of life as well as functional benefits such as improved chewing efficiency. This improved function could increase the range of food that the patients can eat and as a result, improve their nutrition and general health.

Implant retained over denture was selected in this patient as the morphology of the residual ridge did not provide a good prognosis for retention and stability of completely tissue supported denture. Various treatment strategies available for implant over dentures include, mainly tissue supported, tissue implant supported and fully implant supported over dentures.⁵ Due to financial constraints and lack of bone height in

posterior mandible only two implants were planned to retain the prosthesis. Midline fracture of complete denture has various causes such as sharp labial frenum relief, high palatal arch, premature contacts and interferences during function and improper curing of dentures.⁶ The most probable cause for this case was the lack of balanced occlusion due to reverse occlusal plane and unstable dentures. Hence, a bilaterally balanced occlusion becomes utmost important to provide longevity to the prosthesis and supplements axial loading of implants.

CONCLUSION

Implant retained overdentures using O ring attachments are simple and very effective treatment alternative to the problem of unstable mandibular tissue supported complete denture. These dentures can be progressively loaded to provide the patient with an immediate psychological advantage of improved mastication and aesthetics. Occlusion plays a very important role in the success of implants as it can increase or decrease non axial loading based on the occlusion designed.

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