



RESEARCH ARTICLE

IMPLANT SUPPORTED OVER DENTURES- AN ALTERNATIVE TO CONVENTIONAL COMPLETE DENTURES

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ABSTRACT

Fully edentulous patients face several problems such as residual ridge resorption, excess salivary flow, muscle tone reduction and other factors that affect the retention quality of conventional dentures. Such patients require greater retention for chewing and psychological reasons. Implant supported prosthesis increase satisfaction and quality of life in these patients. This article presents a case report where prosthetic rehabilitation of the patient was done with implant supported over denture in maxillary and mandibular arches using different attachment systems.

INTRODUCTION

The complete fixed dental implant prosthesis is a complex procedure and cannot be implemented in every patient. Implant supported overdentures are a good therapeutic alternative for such patients. In recent years, dental implants have enjoyed great success in edentulous patients, and have improved patient satisfaction, prosthetic outcomes in complete dentures, preservation of bone resorption and neuromuscular adaptation (Cheng *et al.*, 2012; Khoo *et al.*, 2013; Cooper *et al.*, 2008; Heckmann *et al.*, 2009). Implant retained overdentures have been provided on both splinted and free standing implants (English, 1994; Chee, 192; Epstein, 1992; Mc Cracken's Removable Partial Prosthodontics, 1993; Davidoff and Davis, 1995; Federick and Caputo, 1996). Unsplinted overdentures represent least expensive options and are easy to fabricate while offering potential aesthetic, phonetic and maintenance advantage (Cavallaro and Tarnow, 2007). However, clinical comfort in implant supported over dentures is dependent on many factors such as degree of retention provided by proper locations and orientation of implants, sufficient interarch space for implant, attachment placement and proper denture fabrication. Long term function and survival of free standing implants with attachments in mandible are well established (Naert *et al.*, 1999; Naert *et al.*, 2004); although there has been

an interest in applying the same treatment concept to maxilla, this has not been supported by many studies yet (Sanna *et al.*, 2009; Narhi *et al.*, 2001).

CASE REPORT

A 60 year old female patient reported to the department of Prosthodontics at DAV Dental College, Yamuna Nagar for replacement of her missing teeth. The patient was a previous denture wearer since 5 years and was unsatisfied with retention of the dentures. On oral examination, it was found that the patient had completely edentulous maxillary and mandibular ridges. Moreover, mandibular ridges were highly resorbed resulting in unstable dentures; also, making it difficult to provide fixed implant restorations. The patient did not have any medical condition and was not taking any medications that could compromise the healing response. Therefore, we planned to provide the patient with implant supported overdentures for both the arches. The patient was explained regarding the present state, procedures, alternative treatment plans and then informed consent was obtained from the patient regarding the following treatment plan:

- Placement of 4 implants in maxilla and 2 implants in mandible.
- Fabrication of implant supported overdentures after 5-6 months of osseointegration period.

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Two weeks after implant placement, the patient’s existing prosthesis was relined with resilient liner and patient was allowed to wear the denture. The patient was instructed with oral hygiene measures in order to have uneventful healing.

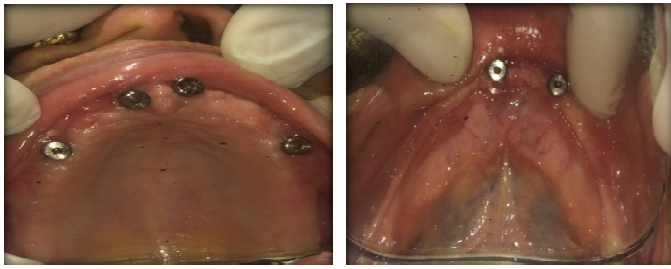


Fig. 1. Placement of healing abutments

After 6 month healing period, healing abutments were placed and preliminary impressions of both the arches were taken in irreversible hydrocolloid material using stock trays. (Fig.1) Autopolymerizing acrylic resin was used to fabricate custom tray with openings for screw retained impression copings. Polyether impression material was used to make final impression. After removal of the tray, copings were connected to implant analogs and definitive cast was poured with type IV dental stone to reproduce implant location and denture bearing area. Record bases and occlusal rims were fabricated on the master casts to record vertical and horizontal jaw relations. Final trial with balanced teeth arrangement was checked for aesthetic appearance, phonetics, vertical dimension of occlusion and centric relation prior to processing of dentures

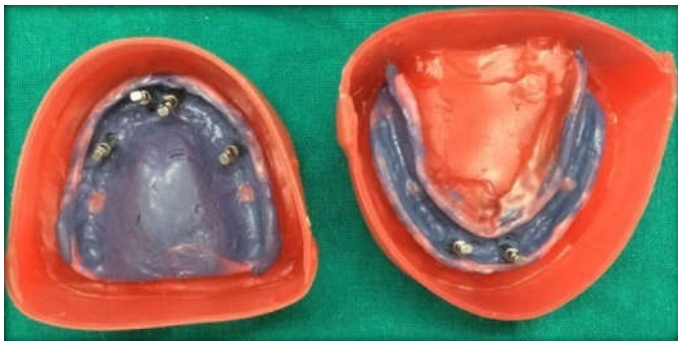


Fig. 2. Beading and boxing of the final impression with implant analogs



Fig. 3. Definitive cast with implant analogs

Chair side ‘pick up’ technique was used for incorporation of the attachment into the maxillary denture. This technique provides passive, loaded (i.e. bite force) environment to ensure complete seating of the denture on the underlying tissues. The locator attachment was placed onto the implants with white

block out rings and locator denture caps (Fig.5). On the intaglio surface of the denture corresponding to the implant abutments, space was created and filled with acrylic resin. The denture was then seated on to the implant and allowed to polymerize. Upon setting, denture was relieved of any flash and smoothed. (Fig.7).

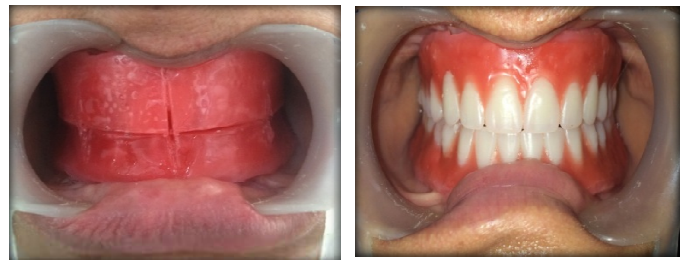


Fig. 4. Jaw relations and final Try-in



Fig. 5. Locator attachment was placed onto the implants with white block out rings and locator denture caps



Fig.7. Placement of corresponding Attachment housings



Fig. 8. Post-Rehabilitative extra-oral and Intra-oral view

Similarly, during mandibular denture insertion, the ball attachments were screwed (Fig.6) on to the implant and ball housings attached to the ball end. On the intaglio surface of the denture corresponding to the opposite implant abutments space was created and filled with auto polymerizing resin. Then, the denture was inserted in the patient’s mouth and she was asked to close into maximum intercuspation. Once the polymerization

was completed, flash was removed and intaglio surface of the denture was trimmed and smoothed. After 24 hours, the patient was recalled for minor adjustments. After 1 week follow up, patient expressed contentment with her new set of dentures in terms of its retention and stability. (Fig.8)

DISCUSSION

The success of osseointegrated implant rehabilitation of edentulous jaw introduced a new era of management of edentulous predicament as described by Branemark *et al.* Rehabilitation of edentulous maxilla with implant is considered to be one of the most complex restorative challenges as there are number of variables that affect both aesthetic and functional aspect of prosthesis (Jivraj *et al.*, 2016). Since, the aesthetic requirements and preoperative situation of each patient varies and is unique; prosthetic designs for treatment of edentulous maxilla may be fixed or removable restoration. Implant supported overdentures are fabricated when excessive tissue defects prevent the use of fixed prosthesis or when the quality and quantity of bone does not permit ideal placement of implant to provide adequate support for fixed restorations. A minimum of 15mm space from the opposing dentition is required for implant overdenture to accommodate the metal framework, heat processed acrylic resin and prosthetic teeth as was seen in the present case report (Azorin *et al.*, 2013). Although, several attachment systems have been successfully used with removable implant supported overdenture, however the choice of attachment depends upon the amount of retention required, jaw morphology, anatomy, mucosal ridge, oral functions and patient compliance for recall. In the present case report, locator attachments have been used for maxillary implant supported overdenture. It is a new system which does not use splinting of implants. They are self aligning has dual retention and are available in different colors with different retention values. Moreover, they are available in different heights, are resilient, retentive, and durable and have built in angulations compensation (up to 40°). In addition to this, the locators have fast and easy repair and replacement (Vogel, 2008; Cakarar *et al.*, 2011). On the other hand, in mandible implant supported ball end attachment systems were used as it is easier to place. They are less costly, less technique sensitive, there is less marginal bone stress and help to maintain correct hygiene. Furthermore, they do not require great prosthetic space and allow hinge and rotational movements; however, cannot be used with non-parallel implant abutments (Vogel, 2008). After 6 months and 2 years recall, it was seen that the patient was satisfied with her overdentures that served several purposes like it preserved her alveolar bone, proprioception; increased masticatory efficiency as well as retention and stability.

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