A Metal Reinforced Mandibular Implant Supported Overdenture Vs Conventional Maxillary Denture - A Case Report

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Abstract

Background - Mandibular implant supported overdentures (IOD) overcome the difficulties faced by conventional mandibular dentures. Due to increased load and lesser thickness, they often fracture. In this case report, we present a metal reinforced mandibular IOD to overcome this drawback.

Case description - An elderly, completely edentulous patient with a severely resorbed mandibular ridge reported to the department for a prosthesis. After a thorough study, it was decided to fabricate a mandibular IOD, reinforced with metal mesh to increase its strength.

Discussion - Mandibular dentures are known to be prone to frequent fractures. In an attempt to increase its strength and longevity in function, we reinforce it with metal mesh. This case report is unique since, a metal reinforced mandibular implant supported overdentures are extremely rare.

Conclusion - A regular follow-up of the patient revealed satisfactory patient outcome.

Keywords - Mandibular Implant supported overdentures, Ball attachments, Osseointegration

Introduction -

According to Engquist, et al, (1988) more than 45% of the population have lost their entire teeth by the age of 70 years. This necessitates the need for a prosthetic denture fabrication for such individuals. Among these, a vast majority of of patients opt for a complete denture prosthesis fabrication to aid in mastication, upliftment of aesthetics and betterment of phonetics.

Yet, the dentists and and patients alike, present with more problems associated with mandibular complete dentures as than any other prosthesis. These problems arrive mostly in the form of loss of retention. [1-3]

Among the various solutions to this problem, placement of a Dental Implant enhances support, retention and stability of the prosthesis which in due course will be built on it. In the recent years, the Implant Supported Overdenture (IOD) has become a frequently acceptable mode of prosthetic treatment option. Some advantages of IOD [4] -

1. Prevents Anterior Bone Loss;
2. Improved Esthetics;
3. Improved Stability;

4. Improved Occlusion;
5. Decreases soft tissue abrasion;
6. Improved Chewing efficiency and masticatory force;
7. Increased Occlusal efficiency;
8. Improved Prosthetic retention;
9. Improved Prosthetic support;
10. Improved speech;
11. Reduced Prosthetic size.

Awad et al, compared patient satisfaction in aesthetics and function in conventional complete denture versus implant supported overdenture patients and concluded that there was a significantly higher satisfaction, comfort and stability in the IOD wearing patients. Thompson reports a 36% higher satisfaction in a similar comparison. [5-7]

Mandibular edentulous arches that undergo extreme resorption and fail to offer adequate support or retention, are most commonly given an implant supported overdenture prosthesis. Impression making techniques in IOD, affect directly to the resulting retention and stability of the resulting prosthesis and hence accurate and precise record of the implant and adjacent hard and soft tissues is of utmost importance. This would ensure an accurate dental replica and a final prosthesis with a better masticatory performance and a greater patient satisfaction. [8]

Case Report -

A 67 year old male patient reported to the OPD in the Department of Prosthodontics, Crown and Bridge. He complained of difficulty in eating due to missing teeth. On clinical examination, it was revealed that the patient had completely edentulous Maxillary and Mandibular arches.

Clinical Examination -

The mandibular edentulous ridge was severely resorbed. An orthopantomogram was advised and radiographic analysis was done.. Diagnostic impressions were made using Irreversible Hydrocolloid Impression materials and poured in Type 2 Gypsum Product - Dental Plaster. A thorough analysis of the case was done and the patient was given treatment option for different types of complete denture prosthesis fabrication, since a conventional complete denture had a very poor prognosis.

The patient opted for a mandibular, Implant Supported Overdenture fabrication prosthesis with an opposing Conventional Maxillary Complete Denture prosthesis.

Surgical Phase -

Stage 1 Implant placement surgery was planned. Lignocaine Hydrocolloid (2%, 1:80,000) was used to administer the local anaesthesia for the Inferior Alveolar Nerve Block and the Long Buccal Nerve Block (Classic 1, 2, 3 Blocks).

Crestal incisor was given and a full thickness mucoperiosteal flap was reflected.

In this case, a 2-stage implant placement protocol was followed and implants were placed in the ‘B’ and ‘D’ positions of the edentulous mandibular arch. Pilot drilling was done to ensure the direction and placement of the implants and sequential drilling was done in both the osteotomy sites.

During the osteotomy, mutual parallelism was ensured and verified frequently by placing direction indicators in the osteotomy spaces.

The mucoperiosteal flap was repositioned and non-absorbable Mersilk 3.0 (Ethicon) suture was given. Post-operative medications were administered and follow-up was done. Sutures were removed on day 7 after ensuring and assessing soft tissue healing. Patient was recalled on day 10 for second stage surgical procedure, and implant abutment placement procedure was performed. the soft tissue was allowed to heal for 5 days and the patient was recalled for follow-up.

Prosthetic Phase -

3 months after the placement of the implants, the patient was recalled to check for stability and ensure osseointegration before commencing the prosthetic phase.

Maxillary Preliminary Impression was made using Impression compound and Mandibular Preliminary impression was made using Irreversible Hydrocolloid impression material. The impressions were disinfected and poured in Type 2 Gypsum Product - Dental Plaster. Spacer adaptation was done and Custom tray fabricated. Double spacer was given over the implant abutment region.

Border moulding and final impressions were made with maxillary arch using low fusing green stick impression compound and Zinc Oxide Eugenol Impression Paste. A Condensation Silicon Elastomeric Impression Material was used to make mandibular arch impression. Both the impressions were disinfected and poured in Type 3 Gypsum Product - Dental Stone. Wax Occlusal Rims were fabricated and Maxillomandibular Relation of the patient was recorded. Teeth arrangement was done and the patient was recalled for try-in procedure.

Phonetics, aesthetic, Occlusal intercuspation and excursive movements were checked. With a satisfactory response from the patient, the waxed up dentures were sent for laboratory processing.

An additional feature of incorporating a wire mesh in the mandibular denture base was done to ensure added strength of the denture base. O-ring rubber attachments were also incorporated.

After completion of finishing and polishing procedures, the patient was recalled for denture insertion. aesthetics, phonetics and occlusion was verified and post-insertion instructions were given.

The patient was recalled for a 24 hours, 7 days, 30 days and 6 month follow-up.

Informed consent of the patient was taken to use his pre-operative, intra-operative and postoperative images for educational purposes.

Discussion -

An implant supported prosthesis is a boon to the patients with inadequate ridge height. It allows a normal functioning of the oral and peri-oral musculature enabling the patient to restore his confidence. In this case, we have used 2 independent implants which allow better scope for movements. The laboratory time is also reduced as the pre-fabricated, stock retentive abutments can be used. This allows a shorter waiting period and cost for the patient. [9]

In case of failure of the prosthetic abutment, replacement/repair would also be easier. The incorporation of the attachment matrices like the rubber cups, is extremely important and requires clinical expertise. As with any procedure, a treatment is successful only with a regular follow-up and maintenance of the prosthesis. And hence, the patient must be educated about the importance of this and advised for a regular review. [10]

Conclusion -

An Implant retained prosthesis, in this case, an Overdenture, is an extremely technique-sensitive procedure. Its success rate depends on several factors such as the patient compliance, the doctors' expertise and the maintenance and regular follow up reviews. It is thus extremely important to make sure that the case selection and study as well as the analysis is done very well.

Implants in the Mandibular arch

Final Impression made

Try - in of Waxed Up Denture

Finished-Polished Denture with mesh incorporated

Denture Inserted

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