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ENHANCING FUNCTION AND ESTHETICS IN EDENTULOUS PATIENTS: A CASE REPORT ON IMPLANT-SUPPORTED OVERDENTURES

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ABSTRACT

Background: Prosthodontic needs of edentulous patients are varied. In-situ conditions and psychological priorities of patients necessitate modification of treatment plans to serve better. Both the just born as well as geriatric patient will require such care.Modern implant therapy has been shown to help overcome a shortcomings of traditional denture therapy. Implant supported overdentures are recommended to enhance patient comfort including retention, stability, and aesthetics.

Case report:: A 66-years-old male complaining of all missing teeth in mandible and a few missing teeth in the posterior maxilla with periodontally compromised anteriors, sought rehabilitation . Implant supported complete arch prosthesis was suggested in the lower arch followed by extraction of all teeth in maxilla and further rehabilitation after CBCT evaluation .Two implants in the anterior region were placed under L.A. After 3-4 months, post surgical phase,healing abutments were placed and bar retained overdenture in lower arch was provided.

Conclusion: Survival of implants supported overdenture was very high in mandibular arch with a Survival rate of implant >96.1%.Careful selection and tactful treatment will ensure good prognosis.

Keywords: Implant, Overdenture, Implant supported overdenture, Bar retained overdenture, Complete denture

INTRODUCTION :

Although this patient agreed to receive 2 implant supported denture in the mandibular arch, he did not initially agree to extraction of the compromised teeth in the maxilla. Subsequent to the insertion of overdenture supported by 2 implants in mandible ,this patient realized the need for the same in the upper jaw.
This case report describes the fabrication of bar retained overdenture in lower arch and conventional denture in upper arch .

Case report:

A 66-years-old male patient reported to the Prosthodontics department at Sree balaji dental college and hospital, Chennai, with a chief complaint of ill fitting lower complete denture . The patient's general health condition was evaluated and tentative treatment plan of placing 2 implants in mandibular arch and 4 implants in maxillary arch followed by overdentures was advised. The patient's lower denture was non-retentive, making it difficult for them to eat or speak normally. On clinical examination, patient had completely edentulous mandibular arch and partially edentulous maxillary arch(Figure 1:Pre-operative radiograph). Patient was explained about the poor prognosis of remaining maxillary teeth and about the limitations and compromised retention of a conventional complete

denture in the mandibular arch .The maxillary ridge, however, had sufficient height and width for adequate retention and stability with conventional denture construction.
The following treatment options were given to the patient ,
1. Removable partial denture in maxillary arch and bar retained overdenture in mandibular arch after implant placement .
2.Extraction of all teeth (with poor prognosis) in maxillary arch followed by conventional complete denture and bar retained overdenture in mandibular arch after implant placement .
After Informed consent, all the teeth were extracted .Diagnostic impressions were made using impression compound(Pyrax, Uttarakhand, India)and tentative jaw relation was done to verify the available inter arch space. CBCT scan was taken and surgical plan for implant placement was done with implant planning software. (Blue Sky Bio, Libertyville, United States).
A Surgical guide was fabricated using a clear self cure PMMA resin with the opposing teeth as a guide for placing implant.
Denture duplication :
Putty index of the existing denture(i.e .,intaglio surface and occlusal surface) was taken separately. A putty index was cut at the thinnest portion of the base for easy retrival. Later, clear acrylic resin was mixed and poured into the putty index. After the resin polymerised, it was retrieved and trimming & polishing was done(Figure 3: surgical guide)
Phase I-Implant Placement :
Intra oral and extra oral swabbing was done. Local anaesthesia was induced. After mid crestal incision, full thickness mucoperiosteal flap was elevated. Lance drill was placed and sequential drilling done according to the implant size .Two implants of diameter 3.5mm and 11.5 mm length was placed at B and D positions. Primary stability was obtained (40Ncm) and simple interrupted sutures were placed. Post operative instructions and medications were given to the patient(Figure 3: A Radiograph was taken after 3 months).

Phase II-Healing abutment placement :
After 3 months, the patient was recalled for review and osseointergartion of implant was assessed. Post -op OPG was taken and radiographic interpretation was done. Muco-periosteal flap was elevated and cover screws were removed. Gingival formers of appropriate gingival height and diameter were placed ,allowed to wait for 2 weeks for proper gingival contours .

Phase III-Prosthetic phase:
After 2 weeks, sutures were removed. A mandibular diagnostic impression was made using alginate (Tropicalgin,Zhermack,BadiaPolestine,Italy) for a custom tray fabrication procedure.
An individualized custom tray was fabricated for mandibular arch, was perforated prior to use. Open-tray transfer copings were placed. Peripheral tracing was done and final impression was made with addition silicone (Tropicalgin, Zhermack, BadiaPolestine, Italy)(Figure 4).
An intra oral jig trial was verified and maxillary cast was mounted on semi-adjustable articulator using facebow transfer. Then mandibular cast was mounted in centric relation.
A customisable bar system was chosen. The bar's height was adjusted to make it easier to practise good oral hygiene. Next, the assembly of the bar-abutment pattern was cast. The bar was polished and finished, and its passive fit was examined radiographically and clinically(Figure 4: Metal bar framework).Wax trial was done(Figure 6: wax trail).
The trial denture base was adjusted onto the bar using the metal housing and positioner clip (castable bar, Rhein83, Bologna, Italy) (Figure 7). To prevent acrylic resin from flowing between the clip and bar, the intaglio surface of the denture was blocked out and subsequently processed conventionally, The finished bar was placed in the patient's mouth and screwed in with a torque of 35Ncm.
The screw access hole was sealed with Teflon tape. Over and above this, composite restoration was placed. High points were verified and corrected(Figure 8).

DISCUSSION:

Overdenture is defined as any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and dental implants; a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and dental implants.(The Glossary of Prosthodontic Terms 2023, Tenth Edition)[1].
Feine and Carlsson advocated the 2-implant retained overdenture as the standard of care for the edentulous mandible in a consensus conference held in 2002[2].

Wright et al. found that there is a low resorption rate (0.5 mm average bone loss) in 21 patients wearing overdentures supported by two implants and a bar in the mandible after a mean period of observation of 5 years[3]. Visser et al. stated that there is no difference in clinical and radiographical state of patients treated with an overdenture on two or four implants during a 5-year evaluation period. Patients of both groups were equally satisfied with their overdentures[4].

CONCLUSION:

Bar retained overdentures, in the indicated situations like adequate inter-arch space and ability to provide additional retention and stability are a good treatment options. A good laboratory with skillful technician will contribute to successful fabrication[5].Careful diagnosis, case selection, treatment planning, and execution lead to an excellent clinical outcome, which is measured by good aesthetics, comfortable functional results, and long-term survival of the prosthesis[6].

Figure 1:Pre-Operative Radiograph

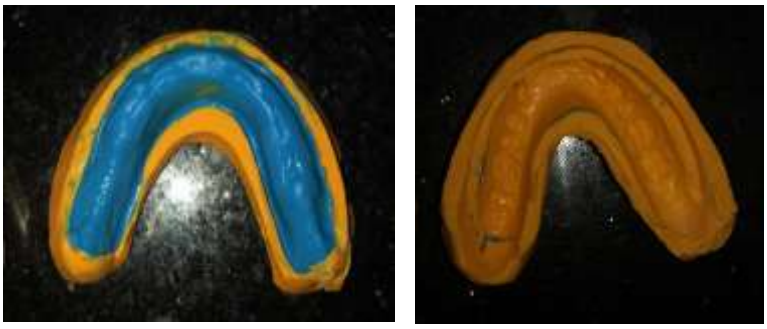

Figure 3: Surgical Guide

Figure 3: A Radiograph was taken after implant placement

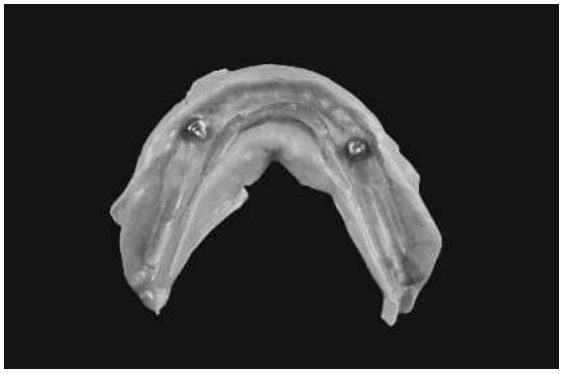

Figure 4: Open tray implant impression

Figure 5: Metal bar framework

Figure 6: wax trail

Figure 7:Fnished prosthesis

Figure 8:Post operative

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