

Rehabilitation with Implant Supported Fixed Prosthesis- A Case Report

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ABSTRACT

Today dental implant becomes the mainstay in treatment of edentulism and prosthodontic reconstruction. Dental implants supported fixed prosthesis has many benefits compared to a conventional removable denture, including increased patient satisfaction, improved speech, esthetic, function and self esteem. The aim of the present case report is to describe the oral rehabilitation of a patient with a fixed implant supported prosthesis. The fixed implant retained fixed prosthesis offers good patient acceptance along with aesthetics, comfort and function in cases of edentulism.

Key Words: Screw retained implant prosthesis, Full arch prosthesis

INTRODUCTION

The use of dental implants to replace missing teeth has become a popular mode of treatment in recent years. The social embarrassment caused by moving dentures and the constant effort to stabilize them have led many patients to seek for implant supported fixed prosthesis. Fixed implant prosthesis are totally implant supported, with no transfer of load to denture bearing areas, thus avoiding the possibility of further resorption associated with tissue born prostheses. Several studies indicated that implant supported restorations performed using meticulous surgical and restorative skills can provide long lasting benefits to edentulous patients [1]. However, the clinician may have to face numerous challenges in accomplishing this task [2,3]. Failure to understand stress factors and stress distribution can lead to bone loss and restoration failure [4]. Thorough pre operative treatment planning, prosthetic driven surgery and splinting the framework can control the distribution of forces [4-7]. This article explains in detail the treatment planning and surgical and prosthetic steps taken to rehabilitate a patient with completely edentulous lower jaw and partially edentulous in upper jaw with implant restorations.

CASE REPORT

A 48-year-old male patient reported to the department of prosthodontics with edentulous mandibular arch and several attrited and missing teeth in maxillary arch. The patient had not significant medical history. The patient was reluctant to wear removable dentures and wanted fixed teeth. He was educated about implant supported fixed prosthesis treatment option. The surgical and the prosthetic procedures were discussed in detail and he gave his consent for a implant-supported fix prosthesis.

Pre surgical evaluation included a thorough clinical and radiographic examination (Figure1-3) to analyze the implant sites. Cone beam computerized tomography (CBCT) scan showed adequate bone height, width and density at all implant sites. Conventional procedures were followed to fabricate interim removable dentures to establish vertical dimension of occlusion and for patient adaptation to it. 6 dental implants supported fixed prosthesis in mandibular arch was planned and two implants supported three unit bridge was planned at site of missing 1st and 2nd premolar and 1st molar region in first quadrant. Conventional Porcelain fused to metal crowns were planned on rest of the attrited maxillary teeth.



Fig. 1: Preoperative mandibular occlusal view



Fig.2: Preoperative maxillary occlusal view

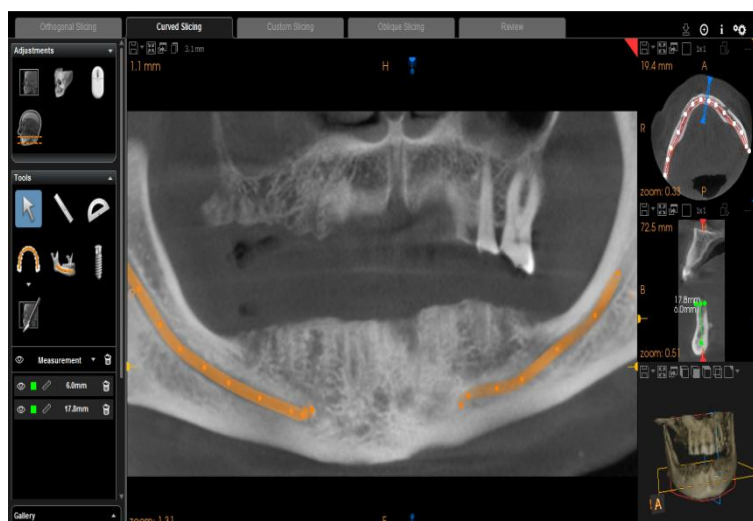


Fig. 3: Cone Beam Computed Tomography report

The cbct finding and selected implant size are:

Mandible

	<u>CBCT scan finding(mm)</u>		<u>Implant size(mm)</u>	
	Length	width	Length	width
Left central incisor	17.2mm	6.0 mm	11.5mm	3.75mm
Left canine	20.5mm	5.2mm	11.5mm	3.75mm
Left 1 st molar	10.6mm	5.0mm	8.0mm	3.5mm
Right lateral incisor	17.2mm	4.5mm	11.5mm	3.5mm
Right 1 st premolar	20.2mm	4.1mm	11.5mm	3.5mm
Right 1 st molar	10.9mm	4.5mm	8.0mm	3.5mm

Maxil

	<u>CBCT scan finding(mm)</u>		<u>Implant size(mm)</u>	
	Length	width	Length	width
Right 1 st ptemolar	15.8mm	6.4mm	11.5mm	4.2mm
Right 1 st molar	9.2mm	6.3mm	8mm	4.2mm

The patient was pre-medicated with appropriate oral antibiotics and analgesics. Local anaesthesia was administered, mid crestal incision was given and mucoperiosteal flap was raised. Six implants were placed in mandibular arch at strategic position and two implants in maxillary arch at site of 1st premolar and 1st molar in first quadrant (Fig 4-6). The implant placement was strategically decided to avoid cantilever in final prostheses therefore 1st molar to 1st molar occlusion was planned in this case.



Fig. 4: Surgical drilling for implant placement



Fig.5: Paralleling guide placement



Fig 6: Implant placement done

The implants were submerged below the crestal bone level. A two-stage surgical technique was planned and cover screws were placed. Suturing was carried out in interrupted horizontal mattress pattern. The sutures were removed after seven days and the removable dentures was given with soft denture liner to avoid excessive pressure on the implants or the mucosa. Soft diet was recommended to avoid excessive loading of implants during the first three months of healing period.

Prosthetic Phase: Six months later, patient was called for the second stage surgery and prosthetic phase. The implant sites were completely healed and free of any signs of inflammation. Incisions were given and cover screws were removed. Transmucosal healing abutments were placed in all the implants. The healing abutments were removed after 2 weeks when the gingival collars were formed around the implants and the sites were prepared for impression. A Closed tray impression technique was followed. Closed tray impression copings were tightened over the implants and impression was made with addition silicone impression material (Fig 7)



Fig 7: Close tray mandibular impression with implant analogs

The impression was removed and implant analogs were attached to the impression copings and casts were poured. The closed tray copings were attached to each other with help of pattern resin on the cast and jig was fabricated for trial to ascertain the accuracy of the impression (Fig 8). Jig for mandibular arch was tightened in the patient's mouth and a radiograph was obtained to ensure a complete and passive seating.



Fig 8: Jig trial in patient mouth

Customized trial denture bases were fabricated on the casts to record the maxillomandibular relations. Tooth preparations were done on remaining maxillary teeth (Fig. 9) and impression was made with addition silicone impression material. The maxillary cast was mounted on a semi-adjustable articulator using a face-bow. Vertical jaw relations were recorded to allow sufficient space for the final prostheses. The mandibular cast was then mounted using a centric relation record on wax occlusal rims (Fig 10).



Fig 9: Tooth preparation wrt maxillary arch



Fig 10: Bite registration

Wax pattern for the metal frameworks were fabricated. Three unit implant supported bridge was given between 1st premolar and 1st molar in maxillary arch. For the mandibular arch, screw retained implant prostheses design was selected to allow easy retrievability, cleansability and maintenance. The implant orientation was such that the retaining screws would pass

through the occlusal aspect of the dental prosthesis (Fig 11). The framework or substructure was casted and then evaluated clinically (Fig 12).



Fig 11: Metal framework on articulation with occlusal view



Fig 12: Metal trial in patient mouth

The screws were tightened sequentially ensuring a passive fit. A radiograph was taken to confirm the complete seating of the framework. The metal frameworks were returned to the laboratory for porcelain veneering (Fig 13-14).



Fig 13: Articulation with permanent prosthesis Left side view



Fig 14: Articulation with permanent prosthesis right side view

A canine guided occlusion with posterior disocclusion during excursions was provided. After glazing final tightening was done with the recommended torque. The screw access holes were sealed with gutta percha and resin composite (Fig 15-16).



Fig 15: Maxillary crown cementation occlusal view



Fig 16: Mandibular prosthesis insertion occlusal view

The patient was comfortable and aesthetically satisfied after prosthesis insertion (Fig 17-19). After insertion post operative OPG was taken to check final fit (Fig 20). Oral hygiene instructions were given and patient was put on regular call after 24 hours, 1 week, and after 3 months and then yearly.



Fig 17: Frontal view



Fig 18: After insertion left lateral view



Fig 19: Smile of satisfaction after prosthesis delivery

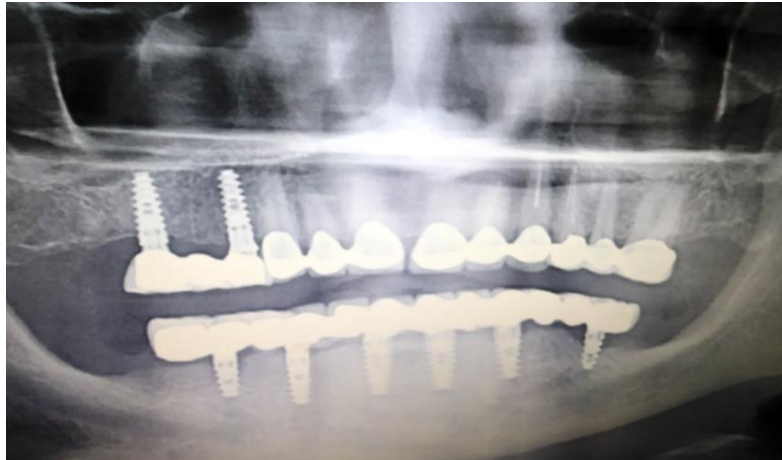


Fig 20: Post operative OPG

DISCUSSION

The literature recommends a minimum of four implants for a fixed restoration but increasing the number of implants provides biomechanical advantages to the prosthesis and avoids cantilevers. An increase in the antero-posterior spread and more number of supporting implants increases the predictability of a successful outcome. The critical performance of the screw joint is affected by the handling of the screw seat. Discrepancy between the screw seat and the retentive screw may lead to early screw loosening.

Although immediate loading is preferred by the patient and restorative dentist alike, but literature cautions at several places that the chances of failure are heightened in cases of immediate replacements. Therefore, a two stage surgical technique was followed in this case.

Cement retained implant restorations are gaining popularity as they are simple, esthetic and economical. But such restorations are difficult to retrieve and any residual cement in the soft tissue surrounding the implant may lead to peri implant disease [18]. A screw retained prostheses design was selected to allow easy retrievability and maintenance.

CONCLUSION

Implant supported fix restoration can serve as an excellent treatment modality for edentulous patients. A long term prosthesis success requires a detailed pre-surgical clinical and radiographic analysis based on prosthetically driven implant position, judicious selection of prosthetic materials, prosthesis design and proper maintenance with a rational understanding of patient expectations and limitations.

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