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ACHIEVING COMPLETE ORAL REHABILITATION WITH DENTAL IMPLANTS - A DETAILED CASE STUDY

**DR. NANDITA BISWAS^{1*} DR. PRASHANT S PATIL² DR. SOUVIR MOHAN PANDEY³
DR. DAYA SHANKAR⁴ DR. TANU SHREYA⁵ DR. SHANKU PAUL⁶**

- 1*) Post Graduate Trainee , Department of Prosthodontics & Crown and bridge,
Hazaribagh college of dental sciences and hospital, Hazaribagh (+91
7000904430, Hazaribagh college of dental sciences and hospital, Demotand,
Hazaribagh, Jharkhand, India 825301 nanditabiswas2712@gmail.com)
- 2) Head of the Department & Professor, Department of Prosthodontics & Crown
and bridge, Hazaribagh college of dental sciences and hospital, Hazaribagh
- 3) Reader, Department of Prosthodontics & Crown and bridge, Hazaribagh
college of dental sciences and hospital, Hazaribagh
- 4) Reader, Department of Prosthodontics & Crown and bridge, Hazaribagh
college of dental sciences and hospital, Hazaribagh
- 5) Post Graduate Trainee, Department of Prosthodontics & Crown and bridge,
Hazaribagh college of dental sciences and hospital, Hazaribagh
- 6) Post Graduate Trainee, Department of Prosthodontics & Crown and bridge,
Hazaribagh college of dental sciences and hospital, Hazaribagh

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ABSTRACT

Full mouth rehabilitation using dental implants represents a comprehensive and transformative approach to restoring both function and aesthetics in patients with extensive dental issues. Dental implants offer a durable and reliable solution for replacing missing teeth, supporting prosthetics, and reestablishing proper occlusion. The rehabilitation process involves detailed planning, including diagnostic imaging, occlusal analysis, and a thorough understanding of the patient's oral health and anatomical structure. This article explores the process and considerations involved in full mouth rehabilitation, emphasizing the use of dental implants as a cornerstone for successful outcomes.

Keywords: Fixed Prosthesis, Implants, Full Mouth Rehabilitation.

INTRODUCTION

Full mouth rehabilitation is a critical aspect of modern dentistry, aiming to restore both function and aesthetics for patients who have suffered significant tooth loss or damage. Dental implants have emerged as a cornerstone in achieving comprehensive oral rehabilitation, offering a durable and natural-looking solution that can transform a patient's quality of life. According to GPT 8 a dental implant can be defined as 'A prosthetic device made of alloplastic materials implanted into the oral tissue beneath the mucosal or/and periosteal layer, and on/or within the bone to provide retention and support for a fixed or removable dental prosthesis; a substance that is placed into or/and upon the jaw bone to support a fixed or removable dental prosthesis.'¹

Implant supported fixed prosthesis provide a permanent solution for loose and missing teeth and also serves as an alternative to wearing dentures thus restoring patients' confidence and smile.

To achieve optimal results, for implant supported fixed prosthesis several factors have been recommended:² Quality of host site, Quantity of host bone, Number of implants, Desire of patient, Generosity of patients smile line.

For rehabilitating an edentulous arch "All-on-Four" technique was proposed. It is also suggested that if we increase the number of implants (around 6) for prosthetic treatment of the edentulous arches it may be beneficial as the stresses on the majority of the implants will be lower.

Success rate of implant supported fixed prosthesis are high with relatively low post operative complications.

CASE REPORT

A 58 years old female patient reported to the Department of Prosthodontics and Crown & Bridge, Hazaribagh college of dental sciences and hospital Hazaribagh, India with the chief complaint of missing teeth in her upper jaw and right and left posterior region of lower jaw. She complaints of difficulty in mastication as well as of poor aesthetics and wanted a fixed prosthesis.

On clinical examination it was revealed that the patient was partially edentulous with having root canal treated 15 and 17. (FIG 3)

In the lower arch 34,33,32,31,41,42,43 was present but with mobility and severely poor periodontal condition. (FIG 4)

Following treatment plan was advised to the patient:

- Extraction for all the lower anterior followed by placement of total 5 implant in the mandible for a full arch prosthesis.
- For upper arch PFM bridge with respect to 15,16,17 and placement of total 4 implant in the maxilla to rehabilitate the rest of the arch.

INVESTIGATION

- 1) The blood test report showed no systemic pathology
- 2) Cone-beam computed tomography (CBCT) was the preferred investigation.

CBCT scan of both the arches revealed the following:

For maxillary arch: 13,24,26,27 and for mandible 37,35,33,44,46 were the sites for implant placement.

SURGICAL PHASE

- In the first phase extraction of the lower remaining teeth were done and mandible was left for healing.
- For implant placement the surgery was performed under local anaesthesia with lignocaine and 1:100,000 adrenaline. A total of 4 implant was inserted in the maxillary arch and suture was placed.
- Appropriate antibiotics and analgesics were prescribed and after 7 days sutures were removed.

- After 2 weeks, five implants were placed in mandibular arch and similarly suture was given which was removed after 7 days.
- Implant stability was sufficient (35 N/cm measured with a torque spring) for all 9 implants.
- Healing was uneventful and a OPG was taken to check the conditions of the implants (FIG 5)
- After 2 months of implant placement, second-stage surgery was performed to place healing abutments and prosthetic rehabilitation was conducted. (FIG 6)

PROSTHETIC PHASE

- For rehabilitation, a conventional alginate impression was made, and study models were obtained. custom tray was manufactured with self cure acrylic resin. window cut was given over the implants for emergence of the impression copings.
- Then, the healing abutments were removed; appropriate open tray impression copings were selected and fitted.
- The open tray was tested in the mouth, ensuring that the impression copings aligned with the openings in the tray. This allowed for easy removal of the impression copings while ensuring they were adequately supported by the impression material.
- A putty light body impression was made and once the impression was set, the impression copings were unscrewed through the window on the tray, and the impression was removed from the mouth along with all the impression copings in place. (FIG 7)
- Jig trial was carried out to ensure the alignment of the implants. (FIG 8)
- The metal framework was tried in the mouth and necessary corrections were carried out. (FIG 9)
- The final restoration was realized with complete ceramic layering.
- The trial was done, and occlusal adjustments were made with the occlusal modifications, bite forces are primarily compressive in nature to the prosthesis, the implants, and the bone. The prosthesis was then cemented and the screws were covered by composite. (FIG 10, FIG 11)
- Post delivery instructions regarding maintenance of oral hygiene and prosthesis were given.



FIG 1 – PREOPERATIVE FRONTAL VIEW



FIG 2 – PREOPERATIVE SIDE VIEW



FIG 3 – PARTIALLY EDENTULOUS MAXILLA WITH RC TREATED 15,17



FIG 4 – PARTIALLY EDENTULOUS MANDIBLE WITH ANTERIORS



FIG 5 – TOTAL 9 IMPLANT PLACED.
4 IN MAXILLA, 5 IN MANDIBLE



FIG 6 - GINGIVAL COLLAR FORMATION 2 MONTH AFTER IMPLANT PLACEMENT



FIG – 7 OPEN TRAY IMPRESSION



FIG 8 – JIG TRIAL DONE



FIG 9 – METAL TRY IN DONE



FIG 10- MAXILLA AFTER
CEMENTATION OF FINAL
PROSTHESIS



FIG 11- MANDIBLE AFTER
CEMENTATION OF FINAL
PROSTHESIS



FIG 12 – POST OPERATIVE FRONTAL VIEW



FIG 13 – HAPPY PATIENT

DISCUSSION

The purpose of this paper is to present a patient who was treated successfully with full-mouth implant supported fixed prosthesis. There are numerous advantages provided by implant-retained prostheses over conventional, edentulous restorative paradigms. When compared to conventional denture treatment, patients wearing implant-retained prostheses demonstrated an increase in neurosensory and tactile function over conventional denture therapy, simulating the feeling of a real dentition.³

The original work of Branemark *et al.*⁴ was carried out in 1977, whereby they utilized 4–6 vertical implants placed within the anterior segment of the edentulous maxilla and mandible cantilevered to accommodate a full-arch fixed prosthesis. Their 10-year study (78.3%–80.3% for the maxilla and 88.4%–93.2% for the mandible) showed a good success rate.

Precision in any full-arch rehabilitation involving implants is crucial.⁵⁻⁶ The process is complex, involving meticulous planning, precise surgical intervention, and customized prosthetic design.

CONCLUSION

In conclusion, full mouth rehabilitation using implant-supported fixed prostheses offers a transformative solution for patients with extensive dental issues, restoring both function and aesthetics. This approach, grounded in thorough diagnostics and meticulous planning, provides a durable and stable alternative to traditional dentures. While the process is complex and requires a significant investment of time and resources, the long-term benefits ranging from improved oral health to enhanced quality of life are substantial. As advancements in dental technology continue to evolve, the potential for even more successful outcomes in full mouth rehabilitation is promising, making it a cornerstone of modern restorative dentistry.

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