

## MULTIDIRECTIONAL APPROACH OF ORAL REHABILITATION WITH IMPLANTS IN A PATIENT WITH LIMITED MOUTH OPENING: A CASE REPORT

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### ABSTRACT

The use of dental implants in the treatment of partially edentulous patients has become an important addition in oral rehabilitation. While the conventional removable partial denture may meet the needs of many patients, others require more retention, stability, function and aesthetics; especially in the mandible. The present case describes oral rehabilitation of a female patient with multiple implants as she was not satisfied with the functional outcome of removable partial denture.

**KEYWORDS:** Angulated Abutment, Dental Implants, Multiple Missing Teeth, Oral Rehabilitation, Removable Partial Denture.

Implants were originally developed for patients with difficulty adapting to complete dentures but are increasingly used as the tooth replacement method of choice for the partially dentate patient. Patients and providers are becoming more and more aware of the undisputable functional and biological advantages of implant restorations compared to conventional fixed and removable prosthesis (Hemmings et al., 2004).

The use of dental implants has now become an established procedure for the treatment of partially edentulous patients. A steadily increasing number of partially edentulous patients are being rehabilitated with oral implants (Okstad et al., 2003). Patient desire for improved masticatory function is often given as a primary reason for treatment with implant-supported or retained prosthesis (Stellingsma et al., 2004). Furthermore, patients were significantly more satisfied with the comfort, stability, and esthetics of the implant-supported prostheses (Heydecke et al., 2003).

The present case describes oral rehabilitation with dental implants in a patient with multiple missing teeth who was dissatisfied with the functional outcome of her existing removable partial denture (RPD).

### CASE REPORT

A 48 year old female patient presented to the Banaras Hindu University, Department of Prosthodontics and Oral Implantology clinic with the chief complaint of difficulty in mastication and unstable mandibular and maxillary RPD. The maxillary and mandibular RPD were

relined several times during the previous 3 years. However, the patient was not satisfied; therefore, it was decided to fabricate fixed implant restorations. The medical history was non contributory and the dental history revealed that the patient had lost her maxillary and mandibular teeth 5 years back due to periodontitis (Figure 1 & 2).



Figure 1: Right pre-treatment lateral view



Figure 2: Left pre-treatment lateral view with root stump in 36 region

Denta scan was done to determine the width and height of available bone for implant placement. After proper treatment planning, two endosseous implants (Hi-Tec tapered self-thread, Life Care. Devices Private limited, Israel) measuring 4.2 x 11.5 mm in dimension and one measuring 4.2 x 10 mm were placed parallel to each other in 45 and 46 with the help of a stent. The impression copings of 45 and 46 were removed due to limited mouth opening and placement of 4.2 x 10 mm implant in 47 region was done (Figure 3).



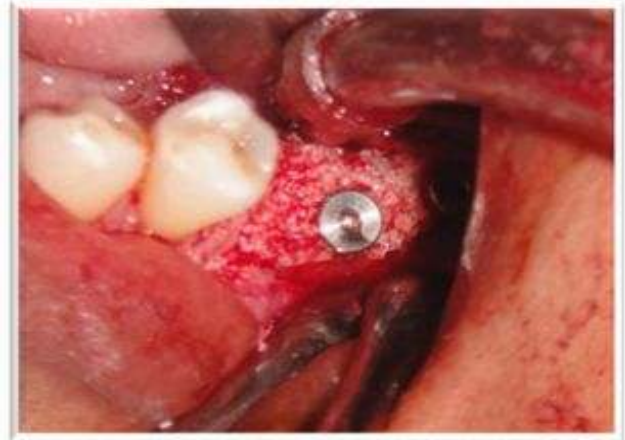
**Figure 3: Implant placed in right mandibular posterior region with two impression copings removed.**

Placement of implant in right maxillary arch was initiated by elevation of mucoperiosteal flap. An endosseous implant with dimensions 4.2 x 10 mm and other two measuring 4.2 x 8 mm were placed in 14, 15 and 16 region respectively (Figure 4). Postoperative healing was uneventful.



**Figure 4: Implant placed in right maxillary region**

The patient was recalled after 2 weeks for placement of implant in left mandibular posterior region. Atraumatic tooth extraction of 36 with periostomes was done. The extraction socket was thoroughly debrided with caution to prevent fracture of thin buccal plate. Distal root socket was selected for placement of endosseous implant. Implant bed preparation was completed after standard protocols using incremental sharp spiral drills and copious chilled saline. Following socket debridement, an implant of 4.2 x 11.5 mm (Hi-tech, Herzlia, Israel) was placed. Adequate initial stability was obtained when placed with a torque driver at 35Ncm. A localized procedure was then undertaken using bone grafts (Osteohealth, Shirley, NY) and another implant of 4.2 x 8 mm (Hi-tech, Herzlia, Israel) was placed in 37 region, followed by placement of interrupted sutures. (Figure 5)



**Figure 5: Extraction with immediate implant placement in left mandibular region along with bone graft**

The second stage surgery for 45, 46, 47 was performed after 3 months and prosthesis was delivered. As bone graft were placed in 36 and 37 regions second stage surgery was initiated after 5 months and subsequently, implants were loaded.

After 6 months second stage surgery in the 14, 15, 16 region was performed. As the implant in 15 region was placed palatally due to inclination of alveolar bone, angulated abutment of 15 degree was used and prosthesis was delivered (Figure 6, 7).



**Figure 6: Upper right implant placed palatally due to bone inclination (16 region)**



**Figure 7: Angulated abutment in 16 region and lower prosthesis in place**

Tooth supported fixed partial denture was planned and delivered in 24, 25 and 26 region as maxillary sinus level prevented placement of implants (Figure 8). The patient was very satisfied as her facial look and oral functions had been improved. (Figure 9)



**Figure 8: Left lateral view with bridge in maxillary posterior region and prosthesis in mandibular region**



**Figure 9: Right lateral view with prosthesis in place**

Patient was instructed about maintaining oral hygiene and recalled after 6 months for follow up. Patient was happy with the functional outcome of the prosthesis. Further, 18-months follow-up examination revealed stable, healthy peri-implant soft tissue.

## DISCUSSION

Removable Partial dentures (RPDs) can greatly impact our ability to eat what we like, especially in public. Many people do not like the feeling of metal and plastic in their mouths (Krishan et al.,1998). Besides, the lesions of the oral mucosa associated with removable prosthesis wearers may be acute or chronic reactions to microbial denture plaque, reaction to constituents of denture base material or mechanical denture injury. A distinct series of destructive changes in the hard and soft tissues of the jaws have been reported particularly in the edentulous regions of the wearers of complete and partial dentures (Jyoti et al.,2010). Therefore, RPDs are usually disregarded by patients like in present case and the installation of dental implants can be beneficial for such patients.

The replacement of missing teeth with implant borne restorations has become a treatment modality accepted by the scientific community for fully and partially edentulous patients. This breakthrough in oral rehabilitation was initiated by the discovery that dental implants, made of commercially pure titanium, can achieve anchorage in the jaw bone with direct bone-to-implant contact. This functional ankylosis is often referred to as osseointegration, and was first described by the two research groups of Branemark and Schroeder (Husein et al.,2006). The osseointegrated dental implant supports a dental prosthesis. It has become widely

accepted treatment because of the high implant success rates observed by clinicians and researchers (Krishan et al.,1998).

Most studies demonstrated that mastication and speech were significantly better with implant-supported prostheses. Furthermore, patients were significantly more satisfied with the comfort, stability, and esthetics of the implant-supported prostheses (Heydecke et al., 2003).

Another beneficial result of providing implant support for the prosthesis is the preservation of the existing residual bony ridge. This has been shown to occur for a group of patients wearing mandibular fixed prostheses supported by 4–6 implants (Wright et al.,2002).

It has been suggested that dental implants can be immediately placed after tooth extraction, because it may preclude dramatic post-extraction bone loss and it may reduce the number of surgeries and treatment time (Park et al.,2010). Further, the placement of implants is limited by the availability and density of alveolar bone. Where there is insufficient bone for implant placement, grafting procedures may be required. The above principles have been followed in the present case for the implant placement in the left mandibular posterior region.

The technique of tilting implants in order to improve bone anchorage reducing the need for bone grafting has been recently advocated by many authors and could provide a viable, minimally invasive treatment modality, leading to high patient acceptance (Testori et al., 2008). In the present case the implant in right maxillary posterior (15) region was placed palatally due to inclination of alveolar bone and therefore the angulated abutment of 15 degree was used.

Access is also important and may be influenced by reduced mouth opening as found in Class II division 2 occlusions and placement in the molar regions. In the present case, we also faced this problem because of the limited mouth opening of the patient. So, the impression copings of 45 and 46 were removed before placement of 4.2 x 10 mm implant in 47 region.

The proximity of anatomical structures to the proposed implant sites must also be taken into account. Appropriate radiographs should be taken to locate incisive and inferior dental canals, nasal cavity, maxillary sinuses and the roots of neighboring teeth. As maxillary sinus was enlarged and its level prevented the placement of

implants, tooth supported fixed partial denture was planned and delivered in left maxillary posterior region in the present case.

## CONCLUSION

Replacement of a single tooth, multiple teeth or the whole arch is now possible with implants. They can be considered the tooth replacement of choice for most clinical situations but are particularly useful when dealing with unrestored, heavily restored and spaced dentitions.

Depending on different situations, a multidirectional approach with implants can be followed successfully in a patient with multiple missing teeth for oral rehabilitation.

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