

CASE REPORT



# Immediate Implant Placement and Immediate Loading in the Anterior Mandible

Sudhir N<sup>1</sup>, Taruna M<sup>2</sup>, Ramu Reddy M<sup>3</sup>, Prashanth M<sup>4</sup>

Department of Prosthodontics and Implantology,  
Kamineni Institute of Dental Sciences,  
Narketpally.

Professor<sup>1&2</sup>  
Reader<sup>3</sup>  
Postgraduate student<sup>4</sup>

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## ABSTRACT:

Immediate implant placement in fresh extraction socket is fast gaining ground as a successful clinical treatment option in recent practice of replacing teeth and restoring function. When periodontally compromised anterior teeth need to be extracted, esthetics and speech demands of the patient require the replacement of these teeth in a short period of time. In such instances rehabilitation of lost teeth is provided for with implants as an immediate prosthetic solution. This is to preclude both the waiting period before restoration and the resorption process due to loss of tooth. The case report describes one such clinical situation where periodontally compromised and rotated mandibular central incisors with diastema were extracted and the patient rehabilitated with immediate endosseous implants and immediate loading, thereby restoring both the esthetic and functional deficits.

**Key words:** *Immediate implant placement, Immediate loading, Micro-movement, Osseointegration.*

## INTRODUCTION

The ancient dentist used Ox bone to replace the lost teeth. Ox bone was carved in shape of tooth and placed in fresh extraction sockets. After several years of such type of practice metallic pins made of steel, copper were introduced which failed in a short period of time because of their corrosive products which lead to disengagement from bone. This is just to mention that the demand for immediate restoration of esthetics and function is basic to everyone who has lost his/her teeth and the concept of immediate tooth implantation takes origin way back in the yore. Later, after many years more biocompatible materials with moduli closer to that of the alveolar bone such as Titanium were introduced in to the field of Implantology in 1947. The father of Implantology, Professor P.I. Branemark

believed that the bone where the fixture is to be placed should heal properly and should have sufficient density to accept the implant<sup>1</sup>. Branemark proposed 2 stage protocol for replacement of teeth with implants where he believed that for osseointegration to occur the fixture should be submerged for a period of six months<sup>1</sup>. However over a period of time research papers published and studies showed that immediate loading<sup>2</sup> of implant with restoration will cause micro-motion<sup>3</sup> that promotes the osseointegration rather than just submerging the implant in bone. The very recent technique is the immediate placement<sup>4</sup> and immediate loading of implant which is gaining popularity. Many studies support the immediate placement of implant in fresh extraction sockets and have recorded clinical success prospectively<sup>5</sup>. With the development of wide variety of improvised implant designs and surface treatments, immediate

Email for correspondence:  
Dr\_sudheer\_aiims@yahoo.com

placement and immediate loading has become a predictable and much preferred technique<sup>6</sup>.

## CASE REPORT

A 31 year old male patient, a Software Engineer by profession reported to the Department of Prosthodontics and Implantology, Kamineni Institute of Dental sciences, Narketpally, with the chief complaint of spacing and perceptible mobility in lower front teeth region since childhood, which gradually increased with time. Clinical examination of the Mandibular central incisors revealed a midline diastema measuring close to 5mm and mesiolingually imbricated with the adjacent lateral incisor teeth, periodontal bone loss and Grade II mobility. Radiographic examination confirmed that the mandibular central incisors were involved with moderate localized periodontitis, with evidence of horizontal and vertical bone loss. On explaining the various treatment modalities, the patient chose extraction of the teeth and immediate restoration with implants as he had high esthetic demands and wanted replacement immediately. The patient however, was informed of the mildly compromised esthetics that could result in trying to negotiate the midline diastema in the restorative phase as the space gained after extraction was not commensurate with the combined mesio-distal width of the central incisors. A VTO thru diagnostic wax-up was made to appreciate the same. The patient however consented prospectively to the increased width of the central incisor crowns. The patient then, was advised periodontal therapy. After primordial periodontal therapy with curettage and root planning, the patient was advised systemic investigations and a DentaScan (Computerized Tomography-Scan) of the mandible. Interpretation of DentaScan revealed 1.3 cm of bone height and 0.45 cm of near-basal bone width at 31 region and 1.67cm of bone height, 0.47 cm of near-basal bone width at 41 region in sagittal, panoramic and paraxial views. What it also revealed was the extreme labial proclination and the very thin labial plate with pronounced dehiscence (Fig 3 and 4). The density of bone measured in DentaScan apical to the root end 600 to 1100HU (Hounse field Units), which is the clear indication of D<sub>1</sub> to D<sub>2</sub> quality of bone.

The treatment plan was extraction of 31 & 41 and immediate placement of implants in the fresh

extraction socket. The sizes of implants planned were 3.5\*13mm (Toureg, ADIN, Israel) in relation to 31 and 3.5\*13mm (Toureg, ADIN, Israel) in relation to 41. The case was posted in Minor operation theatre in the Department of Prosthodontics & Implantology. After administration of local anesthesia an incision was made from distal part of left mandibular lateral incisor to distal part of right mandibular lateral incisor which included sulcular incision around central and lateral incisors, and two relieving incisions on either sides. A full thickness mucoperiosteal flap was elevated. Both 31 and 41 were extracted atraumatically with special care to preserve the compromised labial plate. The extracted sockets were curated, irrigated with antiseptic solution of betadine and saline, the implant bed was then prepared by planning the bone with a surgical round bur.

The initial ostectomy was started with 2.0mm diameter pilot drill in relation to 31 followed by 2.5mm, 2.8mm drills, the depth of ostectomy site was 13mm which was 5mm beyond the root apex to engage optimum apical bone for primary stability. A paralleling pin was placed in the socket which provided a guide for the subsequent ostectomy. The second ostectomy was performed in relation to 41 and the sequence of ostectomy drills used were 2.0mm, 2.5mm, and 2.8mm. The depth of osteotomy site was 13mm which was 4mm greater than existing tooth root apex. A 3.5\*13 mm implant (ADIN-Self threading) was placed into the sockets of 31 and 41 respectively. Anticipating the crestal bone loss the implant was submerged 2mm sub-crestally. The primary stability of implants was confirmed. The implant position was then transferred to the working cast by means of impression transfer copings using a closed tray technique. Given the alveolar base architecture that was labially proclined, the ostectomy followed it. 25° angulated abutments were placed on the implant analogues, the abutments were milled for sufficient clearance and margin placement. Temporaries fabricated. The prepared abutments transferred to the implants. The surgical site was irrigated with antiseptic solution. Allogeneous bone graft (Rocky Mountain, USA) was mixed with fresh blood collected from the patient, and adapted around the implant site to insufficient labial bone. A tailored membrane was then approximated over and

beyond the graft site and the abutments. Sutures were then placed to approximate the full thickness mucoperiosteal flap. The implants were restored with autopolymerizing resin splinted temporary crowns. Following this the patient was prescribed medication and recalled after 14 days. The patient was advised soft diet meanwhile. On the subsequent appointment sutures were removed, and definitive prosthesis was cemented. On recall appointment, the surgical site showed good healing with no apparent signs of inflammation or infection.

### DISCUSSION:

It is proposed that the term immediate loading should refer to situations where implant placement and prosthetic loading with a provisional restoration occur at the same clinical visit, (within 48hrs) <sup>2</sup>. Immediate implant placement eliminates possible disruption of the blood clot during the important early stages of healing. In the present case report, the above mentioned definition of immediate loading was adopted and the implants were loaded in the same clinical visit as the extraction and implant placement. This has the biological advantage of enhancing osseointegration process, hindering the post extraction resorption and creating an esthetic emergence profile. William Becker<sup>7</sup> et al concluded that implants can be successfully placed into alveolar bone of adequate shape and volume with one surgical procedure. One-step Brånemark implants may be considered a viable alternative to two-step implants. The protocol illustrated in this report integrated the use of 2-component implants for a 1-stage, immediate loading protocol<sup>7</sup>. The use of 2-component systems (implant + abutment) was intentional. A two-component system allows decisions about abutment dimensions to solve discrepancies in tissue/component relationships and angulations<sup>7</sup>. However, whether or not the present results may be extended to a larger population that includes systemically compromised individuals or smokers merits careful consideration. This protocol may directly address perceptions of long treatment times and the limited value of expensive therapy by offering a single-visit solution to provisional replacement of a failed mandibular dentition. The

potential cost savings to patients cannot be predicted; however, the reduced number of patient visits, the reduced morbidity associated with fewer surgical interventions, the facilitated esthetic and functional rehabilitation offered by this protocol may represent important reductions to potentially key barriers to accepting this therapy.

### CONCLUSION:

This report contributes to a growing body of literature that supports immediate loading of Endosseous titanium screw-type implants as an expedited treatment of replacing teeth. In selected healthy patients, significant time and clinic visits may be saved by simultaneous extraction, implant placement, and restoration with a simple acrylic resin provisional prosthesis. The reduction in postoperative visits, an absence of postoperative complications and the enthusiasm of patients who receive this treatment suggest that approaches to simplifying implant rehabilitation may increase patient acceptance.

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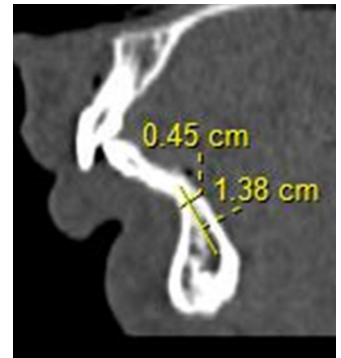
**Fig 1a:** Pre operative



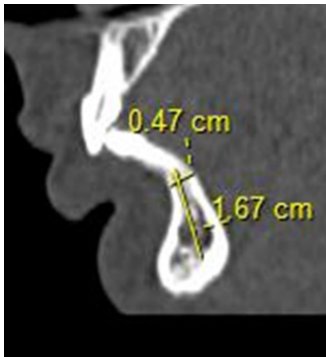
**Fig1b:** Post operative



**Fig2:** Transverse View



**Fig 3:** Sagittal View of 31



**Fig 4:** Sagittal View of 41



**Fig 5:** Full thickness flap elevation



**Fig 6:** Osteotomy



**Fig 7:** Submerged Implants 2mm below the crestal level



**Fig 8:** 250 angulated abutments



**Fig 9:** Bone Graft



**Fig 10:** 250 angulated abutments



**Fig 11:** Definitive prosthesis



**Fig 12:** Pre operative view



**Fig 13:** Post operative view