

A solution to regain bone-loss around immediately loaded short implant: A clinical report.

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Abstract

Immediately loaded short dental implant is a well-recognized procedure to replace missing teeth in situations where atrophic ridges or close proximity to vital structures are expected. It is very conservative, less invasive, economical dental practice but failure of short implants can occur as similar to any other type of dental implants and successful management of failing implant is based on exact determination of etiological factor, proper debridement of site, proper selection of bone graft and barrier membrane etc. this case report discuss the successful management of a immediately loaded failing short implant.

Keyword: Short implant, immediate loading, osseointegration, complications, bone loss, bone graft.

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Introduction

Dental implants are an effective treatment option after invention of osseointegration by Dr. Per-Ingvar Branemark in 1960 for rehabilitation of partially or completely edentulous patients, some of the author claim success rate of dental implant treatment is 81 – 85% for the maxilla and 98 – 99% for the mandible.^[1] In terms of short implant according to Thomas Driskell who invented the short implant in 1968 with the length of 8 mm manufactured by Bicon implant, they claimed 94% of the success rate.^[2] When it comes to the survival rate of immediate loaded short implant then many literatures suggests that short implant do not jeopardizes success rate in immediate loading.^[3] Despite the high success rate, more advanced technologies, excellent surgical skill and excellent implant bio materials, failures do occur most of the time unexpectedly. Annual crestal bone loss up to 0.2mm is considered as normal in the Osseo integrated dental implant^[4], but progressive bone loss with no sign of mobility is known as failing implant.

Either we opt for immediate implant or immediate loading, they are more technique sensitive as compared to our conventional Branemark technique, so in this cases host response, surgical technique, implant design, patient compliance plays very important factors in survival rate.^[5] In literature there are various techniques that has been described such as scaling and curettage with plastic or titanium coated scalers, bone grafting and sometime reimplantation, but bone grafting is a very common management technique to rescue failing dental implants.^[6]

Case report

A 75yrs old male patient reported to the Department of prosthodontics, IDST, Modinagar with a chief complaint of missing left posterior teeth and difficulty in chewing. He also gave history of wearing acrylic resin removable partial denture but he was not satisfied with it.

Intraoral clinical (Fig 1) and radiographic findings revealed missing 36 and 37 and anterior porcelain fused to metal fixed dental

prosthesis for 31,32,33, 41 and 42. Various treatment options present to the patient were removable partial denture cast partial denture, precision attachment and implant supported prosthesis. The patient opts for the implant prosthesis option.

Pre-surgical evaluation

Diagnostic casts obtained (Fig 2) from the impressions of irreversible hydrocolloid were mounted on the articulator in maximum intercuspation for evaluation of inter arch space, supra eruption of opposing teeth and interpretation of the occlusion. The patient was also advised to get cone beam computerized tomography (CBCT) and blood investigation done. The blood investigations revealed normal blood count, bleeding time, clotting time and blood sugar level was also normal. The size of implant was selected on the basis of information derived from CBCT (Fig 3) which also give information about bone density in posterior mandible which was D2.

Surgical phase

Before starting the procedure, a prophylactic dose of 2 gm amoxicillin was given to the patient 1 hour before the surgery. Surgical site was prepared by wiping the face with 5% betadine and the patient was also asked to do intraoral rinses with 0.12% chlorhexidine. Local anesthesia ie; lignocaine with adrenaline (1:100000) was administered using disposable syringe and once it was effective, a mid-crestal incision was made (Fig 4) at the desired site with no. 15 Bard Parker blade and small releasing incisions were given on the mesial and distal aspect of the mid crestal incision to raise the full thickness mucoperiosteal flap. Surgical guide was then placed in position, and initial osteotomy was performed using lance drill. The complete osteotomy was obtained (Fig 5) using all the surgical drills in the sequential manner ie; progressively

increasing in diameter. After completion of osteotomy dental implant (CSM Korea) of dimension 4mm×8mm for both 36,37 regions were placed (Fig 6) and primary stability were achieved up to 35 Ncm, so we decided to follow immediate loading protocol.

Prosthetic phase

Immediate loading

Immediately after implant placement, Abutments were attached to the implants. Pre-fabricated heat cure acrylic resin was modified and relined with monomer free crown and bridge resin (cool temp) to adapt properly to the abutments. After finishing and polishing and adjustment of occlusion, cementation was done with non-eugenol (Relax, 3M ESPE India) temporary luting cement. Non-functional immediate loading (Fig 7) was done, occlusion was again evaluated and intra oral peri apical radiograph was taken (Fig 8). Patient was advised to maintain oral hygiene^[7], take soft diet for 4 to 6 weeks, do warm saline gargles use mouth wash for two weeks, antibiotics and analgesics were prescribed for 5 days, then recalled after one week for follow up. But patient was not able come on recall visit due to covid-19 outbreak. So, the patient visited after 3 months with complaint of loosening of crown wrt 37 along with food lodgment and pain wrt 36. On intra oral examination implant sites were surrounded by debris and screw loosening were seen wrt 37. Then 1st we had cleaned the debris and implant crowns wrt 37 were removed after which intra oral periapical radiograph (IOPAR) were taken. On evaluation of IOPAR almost 50% of crestal bone loss was seen (Fig 9) on the mesial and distal aspect of implant.

Managing complication

Incision was given on both implant site and full thickness flap raised exposing both the implants, curettage was done using Hufriedy implant maintenance kit and debridement of granulation tissues were done. The defective area was decontaminated with 24% Ethylene diamine tetraacetic acid (EDTA) for 2 min and then rinsed with saline, after that xenograft (b-Osteon) was mixed with platelet-rich fibrin (PRF) and condensed in the defect area covering with resorbable collagen membrane (Ossix® plus). After that simple interrupted suture were placed and patient was medicated with amoxicillin 500mg and metronidazole 400mg for 10 days.^[8]

Final loading

Patient was recalled for follow up visits after 1 week and then after 2, 3, and 4 weeks for evaluation of healing and any complication. uneventful healing occurs and then Patient was recalled after 4 months and radiographic evaluation was done which revealed appreciable amount of bone (Fig 10) around the implants. Then 2nd stage surgery was performed along with attachment of healing abutments and patient recalled after 15 days. After removing of healing abutments good emergence profile was seen. Impression copings were attached and open tray impressions were made with elastomeric impression material (Photosil DPI India), shade selection was done. Then after retrieving the impression laboratory analog were attached and gingival mask (Esthetic mask, Detax Germany) was applied. Then crowns were fabricated in laboratory and implants were loaded (Fig 11) with porcelain fused to metal crown as definitive restorations. Then during one year follow up visit, negligible bone loss was found around an implant (Fig. 12) and soft tissue were also quite healthy (assessment by using Colour vue (Hufriedy USA) plastic probe (Fig. 13).

Short implants can be considered as a successful treatment modality for replacement of missing teeth in resorbed ridges and areas in close proximity to anatomical structures, but failures might associate with short implants. Careful evaluation and finding cause of failure is very important for successful management of any failing implant. In immediate loading protocol, success mainly dependent on patient compliance such as maintenance of good oral hygiene, sticking to soft diet for 4 to 6 weeks, avoiding pressure on implants with tongue.

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Conclusion

FIGURES:



Figure 1: Pre op



Figure 2: Diagnostic cast

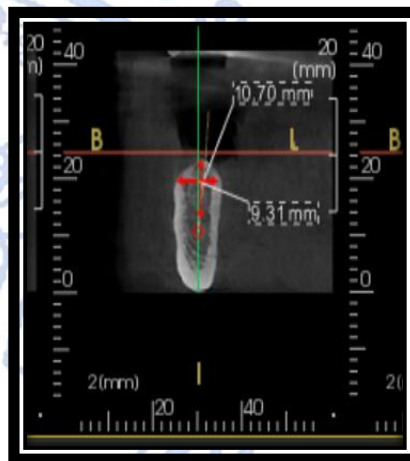


Figure 3: Bone Mapping



Figure 4: Incision and flap.



Figure 5: Osteotomy

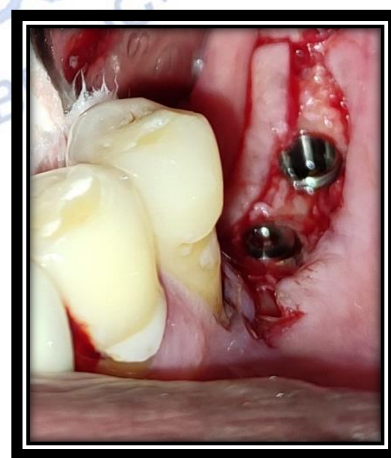


Figure 6: Implant place.



Figure 7: Immediate loading.

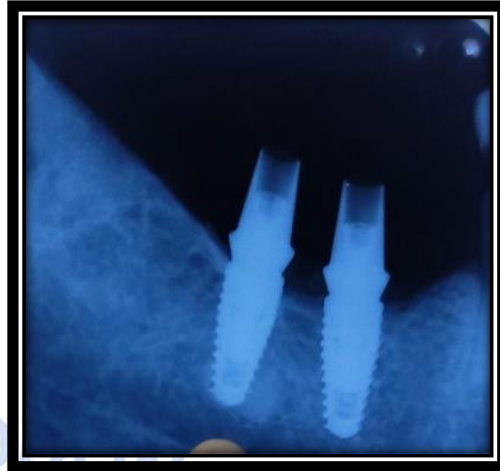


Figure 8: IOPAR after implant placement



Figure 9: IOPAR 3rd months.



Figure 10: IOPAR 6th months.



Figure 11: Final loading



Figure 12: Hard tissues assessment.



Figure 13: Soft tissues assessment.