CASE REPORT

Re-osseointegration of loosened implant in a splinted fixed prosthesis

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Abstract

Various studies have proved the success of the osseointegration concept, if proper and strict protocols are followed for the success. In clinical practice, certain situations arise that makes the clinician to modify his treatment modality to favor the final outcome of the treatment. This paper presents a clinical case report of re-osseointegration of the loosened bead implant occurred during the torque application to tighten the abutment during cementation, which was splinting along with the adjacent well-osseoingrated implant by using fixed partial denture prosthesis. The clinical outcome suggests that proper stabilisation of a loosened implant can re-osseointegrate the implant.

Key words: Loosened implant, re-osseointegretion, splinting

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Introduction

Various studies have proved the success of the osseointegration concept, when proper and strict protocols are followed for the success[1-5] such as sterile protocols,[6] flap design[7] and loading time.[8,9] Since few years, the focus of implant treatment has been on the immediate loading of implants placed in either the mandible or maxilla.[10] Few clinical studies of immediate loading have demonstrated variable success for full-arch rehabilitation, whereas other studies have focussed on the immediate loading and restoration of single and multiple tooth implants in various areas of the oral cavity that have proven to have a high degree of success.[10] The reported case is splinting, of an accidentally loosened endopore implant (Innova Corp, Toronto, Canada) after 5 months of osseointegration.

Case Report

A 47-year-old female patient complained of loosened fixed partial denture of upper arch. On clinical examination it was revealed that, there was a fixed partial denture in relation to 24 and 27 as abutments, replacing missing 25 and 26, of which 24 abutment tooth was mobile. Radiographical findings showed fracture of endodontically treated left first premolar with periapical lesion surrounding the tooth [Figure 1]. The situation was explained to the patient that the mobile abutment tooth has to be extracted and that the existing prosthesis will be not of any use. After locally anesthetizing the area with 2 ml of lidocaine (lignox Warren Pharmaceutical, Mumbai, India) the prosthesis was removed and the fractured premolar was also extracted. The socket was curettaged to remove the granulation tissue at the apex. After debridement, it was found that due to severe bone loss the socket was not favorable for immediate implantation. Hence, endosseous implants were planned in second premolar and first molar edentulous areas, with an anterior premolar cantilever to be designed in the prosthesis. An individual was planned for the second molar which was a prepared abutment tooth of the previous prosthesis.

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A 12-mm long and 5-mm wide endopore implant (Innova Corp) and another 10-mm long and 5-mm wide endopore dental implants were surgically placed in second premolar and first molar region respectively after required osteotomy was performed as per the instructions of the manufacturer. An radiographic confirmation was dine after the placement to confirm the apical aspect of both the beaded implant was at least 2.5 mm short of the floor of the maxillary sinus. The flap was approximated with a vycril suture of 4.0 (Johnson and Johnson ltd, Mumbai, India) for primary closure. The patient was prescribed to take ofloxacin and ornidizole tablet (Ordant, Dr. Reddy's Laboratory,Hyderabad India) 500 mg, twice daily for 5 days to prevent any infection and piroxicam (Dolonex-DT, Pfizer,Mumbai, India), twice daily for 5 days for control of pain and inflammation.

After 5 months of healing phase, osseointegration was confirmed both clinically and radiographically. Subsequent procedures were followed with placement of healing caps and continued with impression procedure. Metal-fused ceramic prosthesis was fabricated for implant in second premolar and first molar region as retainer crowns, along with a anterior pontic in relation to the missing first premolar region.

During the process of tightening the abutment screw with the spring-loaded torque wrench (Hitec torque wrench, Isreal) for the second premolar region implant with 30 Ncm torque led to the rotation of the implant with breakage of the callus (newly formed bone) around the implant with bleeding from the crest of the implant and severe momentary pain to the patient. On clinical examination it was noticed that the implant in relation to second premolar was mobile and rotating in the osteotomy site [Figure 2]. On immediate radiograph no radiolucency was noticed surrounding the implant. As the abutments were already tighten to the implant, it would have taken the same amount the torque to loosen the abutment from the mobile implant, if it was planned to allow the loosened implant to be buried and allowed to re-osseointegrate. The situation was explained to the patient and with her consent it was planned to retain the mobile implant in the same position and splint it along with the adjacent firm and osseointegrated implant in relation to first molar region. Thus, allowing it to reosseointegrate. After the occlusion interferences were checked the prosthesis was cemented with provisional cement (Improve, Nobel biocare, Gotenborg, Sweden) [Figures 3,4]. The patient was asked to have soft diet for a period of 3 months. Clinical and radiological assessments were conducted regularly every month up to 3 months to assess any bone loss or peri-implant lesion around the ailing implant. The radiograph taken at 4th month assured that favorable re-osseointegration had taken place in relation to second premolar region implant. The prosthesis was retrieved through the access holes in the crowns and ailing implant was clinically assessed for any mobility. When clinical examination was satisfactory, the prosthesis was re-cemented back with improve provisional cement. Radiograph taken after 1 year showed no peri-implant radiolucency [Figure 5].

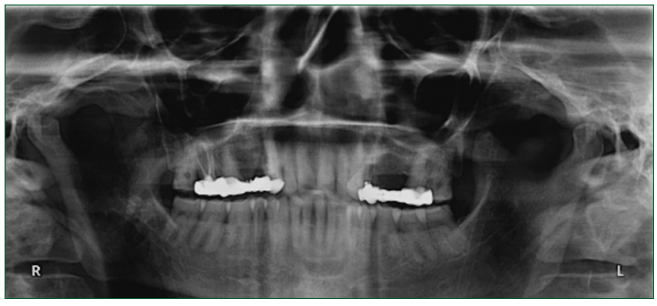

Figure 1: Orthopentograph showing infected 24 supporting the loosened fixed bridge

Discussion

It has revealed that the success of an endosseous dental implant is dependent on the formation and maintenances of secure implant to host bone fixation, which also says that direct implant bone contact is necessary for success of an implant.[5]

In this case presented, it explains a unique treatment modification for a loosened implant, which was splinted with adjacent osseointegrated implant in fixed prosthesis form and functionally loaded. As per the manufacturer's instructions, Endopore implant is not meant to be immediately loaded, as they are sintered porous-surfaced implants. But the same sintered porous-surfaced implants which have three-dimensional interlocking with bone,

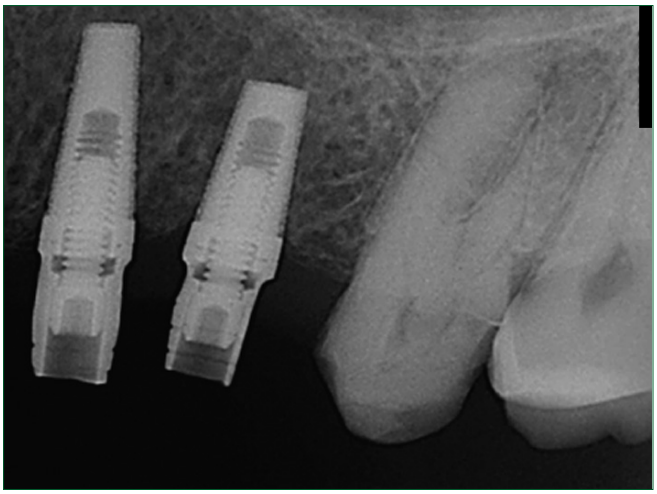

Figure 2: Intraoral radiograph taken immediately after abutment tightening showing the loosened 25 beaded implant and the osseointegreted 26 implant

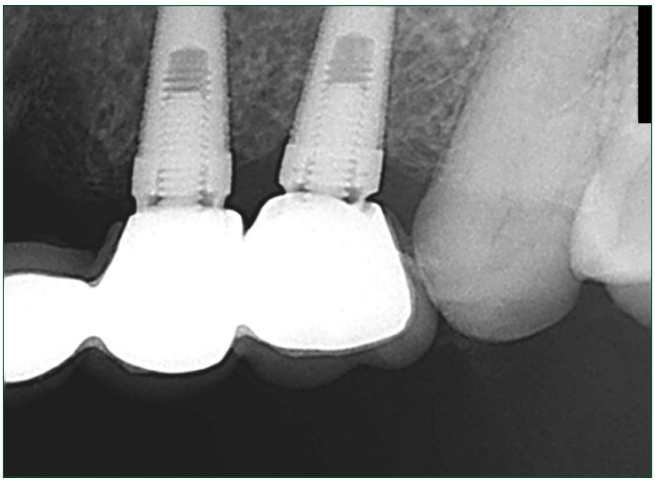

Figure 3: Intraoral radiograph immediately after cementation showing the splinted implants in the prosthesis

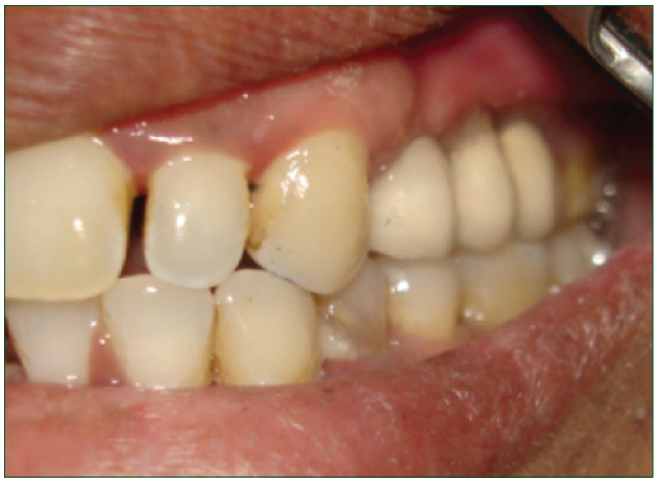

Figure 4: Prosthesis in function immediately after cementation

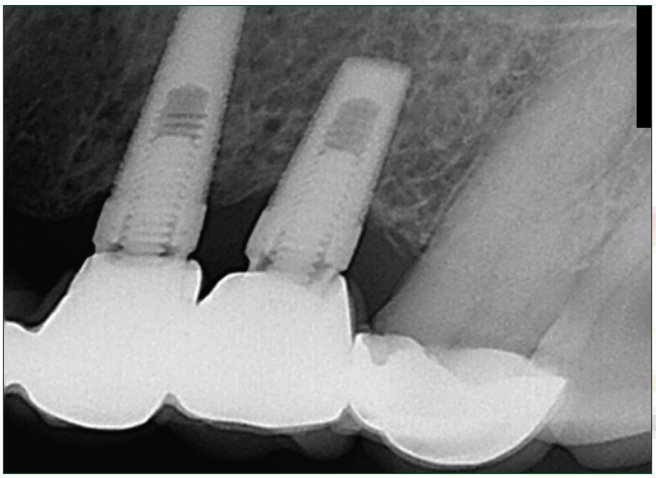

Figure 5: Intraoral radiograph taken after 1 year postcementation of the prosthesis showing re-osseointegretion in relation to 25 implant

Table 1: Summary of bone-implant interface strength determinations

Surface design	Shear strength N/mm²	Tensile strength N/mm²
Machined	1-3	< 1
Grit-blasted	4-6	< 1
Acid-etched	1-3	< 1
Plasma sprayed	>10	2-5
Sintered porous	>10	-10

and having approximately 85 volume percent porosity and an average pore size of approximately 100 μm (range 50-150 μm) gives a strong sintered structure. These implants are truncated conical ranging from 5 to 12 mm in length. The major differences between this surface design and that of the other implants is that, there is ingrowth of bone, a very high interface shear strength and high interface tensile strength [Table 1]. This could be the additional reason for the re-osseointegration after implant mobility, along with the stability and immobilization of the implant got from the splinting of the loosened implant to the fixed implant which was not infected and affected with peri-implantitis.[11]

Thus indicating that loosened implants which are not ailing due to any pathological changes, if stabilized adequately can re-osseointegrate and thus can improve the prognosis of the restoration. This procedure could be a in the management of ailing implants, thus indicating that failing of implants can also occur due the clinical mismanagement during prosthesis restoration.

Conclusions

Splinted, loaded and re-osseointegrated of a loosened implant shows a unique circumstance of osseointegration. Further clinical research, as well as *in vitro* studies is needed, to consolidate the possibilities of immediate loading of beaded or threaded implants in certain situations of mobility, when the prosthesis are cemented.

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