

# Esthetic and Functional Rehabilitation through Early Placement of PRF Augmented Dental Implant in Maxillary Aesthetic Zone.

Manu Rathee<sup>1</sup>, Vinod Khanna<sup>2</sup>, Vikas Yadav<sup>2</sup>

<sup>1</sup>Senior Professor and Head, Department of Prosthodontics, Post Graduate Institute of Dental Sciences, Pt. B.D Sharma University of Health Sciences, Rohtak, Haryana, India.

<sup>2</sup>Post Graduate Student, Department of Prosthodontics, Post Graduate Institute of Dental Sciences, Pt. B.D Sharma University of Health Sciences, Rohtak, Haryana, India.

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## ABSTRACT

Implants placed shortly after tooth extraction have proven to be a predictable treatment modality. The number of surgical appointments and length of surgical phase are reduced, thereby preserving hard and soft tissue configuration. However, there are some limitations to early implant placement. These include a probable lack of soft tissue closure over the extraction site, difficulty in matching the diameter of the implant with that of the extraction socket, partially or totally missing bony housings, and possible accompanying periapical and/or periodontal infection. This clinical report presents early dental implant placement with PRF augmentation in maxillary esthetic zone.

**Keywords:** Early implant placement; Osseointegration; Platelet Rich Fibrin (PRF).

## INTRODUCTION

Good quality peri-implant bone encasing is a prerequisite for optimal osseointegration.<sup>[1]</sup> The contemporary practice suggests a long waiting period between implant placement and occlusal loading. This delay predisposes the residual bone to resorption and this leads to inadequate remaining bone support for implant placement. There is ample supporting evidence in the literature to favour early implant placement with successful outcome.<sup>[2,3]</sup> The tissue healing have been observed to be improved with the concomitant use of Platelet Rich-Fibrin (PRF).<sup>[4]</sup> In the present case, early placement of endosseous dental implant treated with Platelet Rich-Fibrin has been used in maxillary esthetic zone in a young adult patient to promote bone healing and osseointegration.

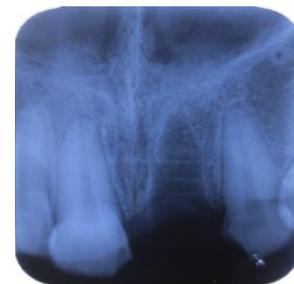
complaint of missing upper front tooth for past one week and wanted replacement of the same. Past dental history of patient revealed that patient met with a road accident 1 month back leading to trauma in orofacial region and fracture of upper front tooth. Patient underwent extraction of the fractured tooth one week back. Clinical examination was carried out. Routine haematological investigations were done and the results were found to be within the normal range. Intra-oral periapical radiograph of the concerned area was taken by making the template using the putty in the Rinn XCP apparatus in order to standardize the view in follow up appointments. [Figure 1] The orthopantomogram was obtained to assess the adjoining anatomic structures. [Figure 2] Various treatment options were discussed with the patient and early dental implant placement was planned. Patient's consent was obtained.

### Name & Address of Corresponding Author

Dr. Manu Rathee,  
Senior Professor and Head, Dept of Prosthodontics,  
Post Graduate Institute of Dental Sciences, Pt. B.D  
Sharma University of Health Sciences, Rohtak, Haryana,  
India  
E-mail: ratheemanu@gmail.com

## CASE REPORT

An 18 year old male patient reported to the Department of Prosthodontics with the chief



**Figure 1:** Preoperative IOPA X-ray showing extraction socket.



**Figure 2:** Preoperative Orthopantomogram.



**Figure 4:** PRF membrane placed around implant.

The surgical phase was carried out under local anaesthesia. The surgical site was prepared aseptically. Infraorbital nerve block and nasopalatine nerve block were administered. After ensuring adequate anaesthesia of the surgical site, a mid-crestal and two vertical releasing incisions were given to raise the mucoperiosteal flap. Osteotomy site was prepared gradually with sequential drilling along the palatal wall maintaining adequate irrigation. The paralleling pin was used to check the angulation of prepared osteotomy site. [Figure 3] Manual torque wrench was connected to the selected tapered threaded endosseous dental implant (Osstem, Korea) and a torque of 35 Ncm was achieved



**Figure 3:** Paralleling pin placed in osteotomy site.

To obtain PRF membrane, patient's blood sample was taken from ante-cubital vein in 10 ml tube without any anticoagulant, and was immediately centrifuged at 3000 rpm for 10-12 min. The fibrin clot thus formed was gently pressed between two layers of sterile gauze to form a membrane. The PRF membrane obtained was placed over the implant site encircling peri-implant bone adjoining the crestal area. [Figure 4].

The mucoperiosteal flap was approximated and sutured. Post-operative instructions were given to the patient regarding oral hygiene maintenance. Patient was recalled after one week for suture removal.

An intra-oral periapical radiograph was taken at 3 months post operatively that showed minimal bone loss around crestal bone. [Figure 5] Then the second stage surgery was planned. A small crestal incision was given followed by cover screw removal with the manual screw driver. Healing abutment was attached to the fixture. [Figure 6]



**Figure 5:** Postoperative IOPA X-ray.



**Figure 6:** Healing abutment attached to the implant.

Shade selection was done using Vita 3D Master shade tabs (Vita Zahnfabrik, Bad Sackingen, Germany). The final prosthesis was fabricated and cemented. [Figure 7] The patient was instructed about home care measures. He was put on regular 3 months follow up. The normal soft tissue architecture was restored around the implant. The

treatment outcome was satisfactory during the follow up.



**Figure 7:** Preoperative and postoperative intraoral view.

## DISCUSSION

Recent literature has shown that the success rate of immediate and early implant placement procedures are comparable to delayed implant placement protocol.<sup>[5,6]</sup> In addition, reduced waiting period for socket healing, shorter period of edentulousness, alleviation of total treatment time, preservation of alveolar bone height and width are some of the reported possible significant advantages of immediate implant placement.<sup>[7,8]</sup> However, this procedure is associated with complicated soft tissue handling as there is less of the soft tissue for covering the early placed implant fixture. In the present case, soft tissue healing was complete before the implant placement surgical procedure. So, the difficulty in soft tissue coverage immediately after implant placement procedure was avoided.

The presence of marginal voids and a lack of uniform contact between the dental implant surface and the socket walls are almost imperative with early and immediate dental implants. In order to combat this difficulty, various surface configurations and diameters of dental implants are available to match the size of sockets of varying dimensions.<sup>[6]</sup> The remaining mismatch between the socket wall and implant fixture can be augmented with available graft materials.

Various studies have substantiated the viability of platelet concentrates including Platelet Rich Plasma

(PRP) and PRF, on enhancement of osseous and associated tissue healing.<sup>[5,9]</sup> PRP has been suggested to enhance the healing of bone grafts and to enhance the integration of implants into bone, as activated platelets release autogenous growth factors into the wound healing site.<sup>[10]</sup> However, it is difficult to localize it over the implant surface, on the other hand, PRF, being a membrane, can be easily localized.

PRF is a platelet concentrate collected on a single fibrin membrane and contains all the constituents of blood required for optimal healing. It is considered as a healing biomaterial and it has a stimulating effect on various aspects of healing of soft and osseous tissue including angiogenesis, immune control, harnessing the circulating stem cells. Furthermore, the membranes presumably prevent flap connective tissue from collapsing into the defect and from contacting the implant surface.<sup>[5]</sup> In the present case report, Platelet Rich-Fibrin was used as an augmentation material with favourable outcome.

## CONCLUSION

Immediate implant placement avoids waiting period associated with contemporary two stage surgical protocol. Early placement harnesses the advantage of reduced gap period of restoration as in immediate placement, as well as advantage of preliminary healing associated with delayed placement. The PRF adjuvant in early placement of dental implant in aesthetic zone was met with predictable outcome.

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