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A comparative Evaluation of Periodontal Parameters around Immediate Implants With and Without Platelet Rich Fibrin (PRF) – A Clinical Study

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Abstract
Introduction: *Human life expectancy has been increased by development in medical science. A longer human span life means that more patients will be partially or fully edentulous. A number of prosthetic techniques are available over time for the rehabilitation of partial or complete loss of tooth/teeth. In order to overcome the problems associated with conventional prosthetic treatment, the dental implants came into existence. With the increasing success rates of dental implants, clinicians and researchers have turned their approach toward making the duration of treatment shorter and more comfortable for the patients.*
Materials and methods*:*
A total of 30 implant fresh extraction sites were selected and randomly divided into two groups. Of these, 15 immediate implants were placed with platelet-rich fibrin (PRF), while the other 15 immediate implants were placed without platelet-rich fibrin (PRF). Patients were prospectively evaluated clinic- radiographically using standardized intraoral peri-apical radiograph with Radio Visual Graph (R.V.G).
Results: *It was observed that the patients in test group are favored with rapid soft tissue regeneration, very less bone loss, and improve with early wound closure, which helps in achieving an esthetic outcome and better patient acceptance. It can be used to fill horizontal defect distance or jumping distance for complete resolution of the space.*
Conclusion: *Immediate implants with PRF lead to stimulation and acceleration of bone regeneration and show tendency toward rapid soft tissue regeneration and reduced peri-implant pain and inflammation. Overall, it is recommended to use PRF as a viable option in improving success and reducing the treatment duration in immediate implants.*
Keywords: *Atraumatic extraction, Immediate implants, Platelet-rich fibrin.*

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I. Introduction

The goal of modern dentistry is to prevent tooth loss and provide a healthy dentition with optimal functional efficiency, structural balance and esthetic harmony[1].The use of osseointegrated implants for treatment of edentulous patients was first described by Branemark et al (1960)[2.] The placement of dental implant into fresh extraction sockets was introduced in 1970 and is a well-established treatment option for replacing missing teeth, allowing the restoration of masticatory function, speech, and esthetics .Immediate placement of a dental implant in an extraction socket was initially described by Schulte and Heimke in (1976)[3].

Placement of an immediate implant will reduce morbidity, treatment costs and treatment time. However, technical complications have been described regarding this technique[4]. When an implant is placed in a recent extraction socket , a gap(jumping distance) between the implant surface and the bone walls of the socket may occur and there are various materials used to fill this gap for better osseointegration, such as autografts, allografts, xenografts, and alloplasts[1]. However, these materials are either expensive or not so effective.Choukron's Platelet-rich fibrin (PRF) regenerative material (2001)[5] has been recently proposed as an aid for promoting hard and soft tissue regeneration.PRF is a second generation PRP where autologous platelets ,leucocytes and various growth factors fastened the healing of soft and hard tissues .Thus the objective of present study is to clinically compare the periodontal parameters for immediate implants with PRF and without PRF.

II. Materials And Method

A prospective, randomized comparative study was conducted in total of thirty implant fresh extraction sites, within the age group of 18 to 65 years, comprising of 8 males and 7 females visiting the Out-Patient Department of Periodontics, Himachal Dental College, Sunder Nagar(H.P) . Patients wererandomly selected for the present study.The patient were randomly allocated to the immediate implants group with PRF(n-15)test

group or immediate implants without PRF group (n-15) control group.Inclusion criteriawere-systemically healthy patients with age group of 18 -65 years,willing to comply with all the study requirements, patient cooperation, motivation ,good oral hygiene**,**no acute infection at extraction remnants at implant site**,**presence of non-restorable maxillary and mandibular teeth due to trauma, caries, root resorption, root fracture, endodontic or periodontic failure, grossly decayed tooth, adequate volume of bone**,** sufficient band of keratinized mucosa(2mm) to allow surgical manipulation and suturing. Exclusion criteria's were pathologic changes at recipient site Smoker, drug or alcohol abuse, uncontrolled diabetes, osteoporosis, malignancies and blood dyscrasias etc.

PRE-SURGICAL PROCEDURE

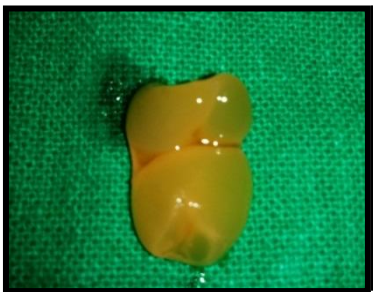
All the patients included in the study were subjected to detailed medical and dental history. Periodontal assessment was done using Plaque Index (Loe and Silness) and Gingival Index (Silness and Loe), measurement of Probing depth and Width of Keratinized Gingiva using UNC #15 probe, complete clinical photographs, diagnostic casts.routineblood investigation and oral prophylaxis.

PLATELET RICH FIBRIN PREPARATION

The PRF preparation for the test group was started 30 minutes before surgery . Just prior to surgery venous blood sample of patient was taken from median cubital vein present in antecubital fossa of the forearm in a standardized fashion . A convenient blood sample was taken from the patient in two sterile 10 ml dry glass tubes without the addition of an anticoagulant & centrifuged at 3000 revolutions per minute for 10 minutes. Blood centrifugation immediately after collection allows the composition of structured fibrin clot. PRF settles down between the platelet poor plasma (PPP) at the top and the red blood cells (RBC) at the bottom of the tube(fig 1). PRF was easily separated from red blood corpuscles base (fig 3)using a sterile tweezers and scissors just after the removal of platelet poor plasma(PPP) and then transferred onto a sterile compress.A stable fibrin membrane was obtained(fig 4).

FIG1:PHOTOGRAPH SHOWING TEST TUBE CONTAINING,FIG 2 : SEPARATION OF PRF FROM BLOOD CLOT

PRF OBTAINED AFTER CENTRIFUGATION



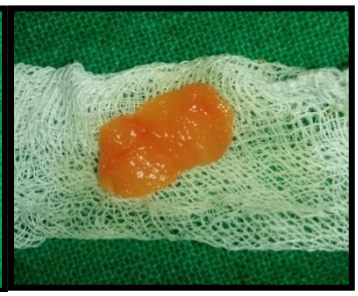


FIG 3 : PRF SEPARATED FROM BLOOD CLOT,FIG 4 : PRF MEMBRANE SQUEEZDED IN A GAUZE PIECE

SURGICAL PROCEDURE:

The patients were scheduled for implant surgery after phase I therapy. All the surgical procedures were performed under local anesthesia 1:80,000 under strict aseptic conditions .Facial skin all around the oral cavity was scrubbed with Povidine iodine solution (5%) and the patient was made to rinse with 0.12% Chlorhexidinedigluconatemouthrinse for one minute prior to surgery.The tooth in question was extracted using a

method involving minimal trauma to the bone and surrounding soft tissues(fig 6). To ensure the same,extractions were accomplished using a periotome and luxators. Following extraction, bone file was used wherever required and the socket was then thoroughly degranulated with curettes and to remove all remnants of the periodontal ligament and granulation tissue.The approximate length and width of extracted tooth were measured with scale or William probe(fig7).

A osteomy was prepared using pilot drill and twist drill sequentially were operated at max. 1000 rpm , 30-45Nm with copious irrigation and final drills (harvest drills) operated at 30-100 rpm/30-50Nm without irrigation. as per manufacturer's instructions.Dentium implants were used in the study. The implant site was generously irrigated with sterile saline to remove any residual bone chip/other residue following preparation.The depth of implant osteotomy site was ascertained with implant depth gauge. The implant was removed from the sterile vialusing ratchet with ratchet adaptor and delivered into the osteotomy site.Implants were then placed into prepared site with manual pressure aided by ratchet with ratchet adaptor engaging the internal hex inside the fixure . Primary stability was assessed with the torque controlled ratchet.Following implant insertion an appropriate cover screw was inserted (fig.11).

The bone grafts were placed as per the requirement. . The residual gap between socket wall and implant threads were grafted with PRF and then PRF membrane was placed in Group II and without PRF membrane in Group I over the cover screw.(fig 12)The procedure was completed by repositioning and suturing the surgical flap with interrupted silk sutures . Then, an immediate postoperative x-ray and RVGwas done. At the end of the surgery, patients were prescribed amoxicillin and clavulanic acid (625 mg tds for 3 days) diclofenac potassium 50 mg + paracetamol 325 mg + serratio-peptidase 10 mg (3 days), and 0.2% chlorhexidine gluconate mouthwash (twice a day for 7 days). Sutures were removed after 7 to 10 days of surgery. A surgical re-entry was performed to remove the cover screw and place a healing cap(fig.13). Abutment was placed.(fig15) Final restoration was given after 3 months.(fig.16).

The patients in both groups were recalled after 7 days for the suture removal.

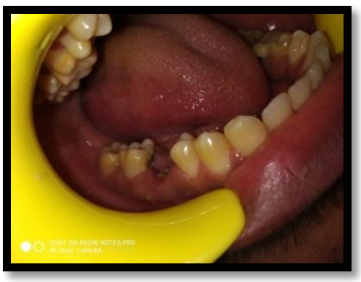


Fig 5: PRE-OPERATIVE PHOTOGRAPH SHOWING RETAINED ROOT STUMP W.R.T 46

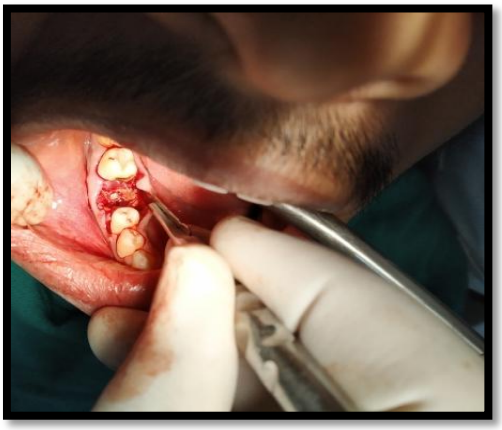


Fig 6: INTRAOPERATIVE PHOTOGRAPH SHOWING SURGICAL SITE FOLLOWING ATRAUMATIC TOOTH EXTRACTION

Fig-7: PHOTOGRAPH SHOWING LENGTH DETERMINATION OF EXTRACTED ROOT

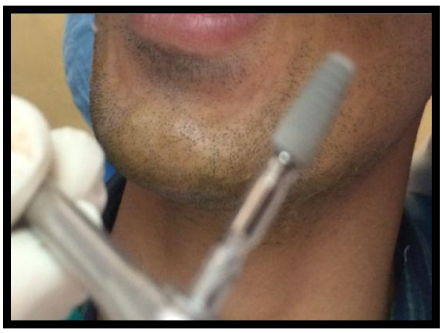


Fig-8: PHOTOGRAPH SHOWING DENTAL IMPLANT

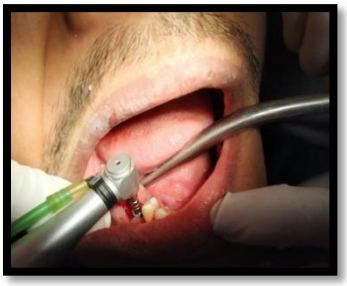


Fig-9: INTRAOPERATIVE PHOTOGRAPH SHOWING PREPARATION OF THE OSTEOTOMY SITE AND PLACEMENT OF DENTAL IMPLANT

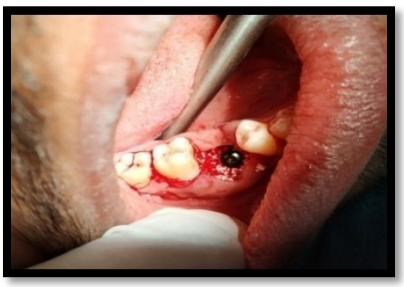


Fig-11: INTRAOPERATIVE PHOTOGRAPH SHOWING COVER SCREW PLACED AFTER IMPLANT PLACEMENT

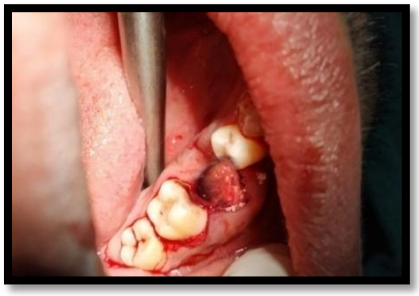


Fig-12: Photograph showing PRF placed over cover

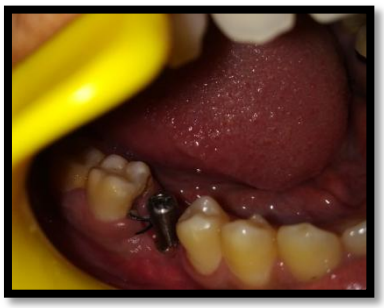


Fig 13: PHOTOGRAPH SHOWING GINGIVAL FORMER PLACED W.R.T 46 AFTER 2ND STAGE SURGERY

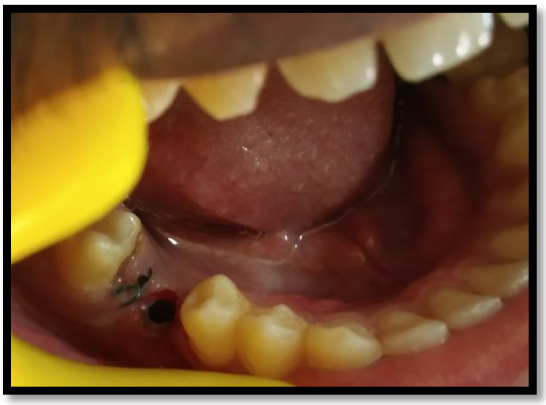


Fig- 14:PHOTOGRAPH SHOWING GINGIVAL FORMER REMOVED W.R.T 46 AFTER 2ND STAGE SURGERY

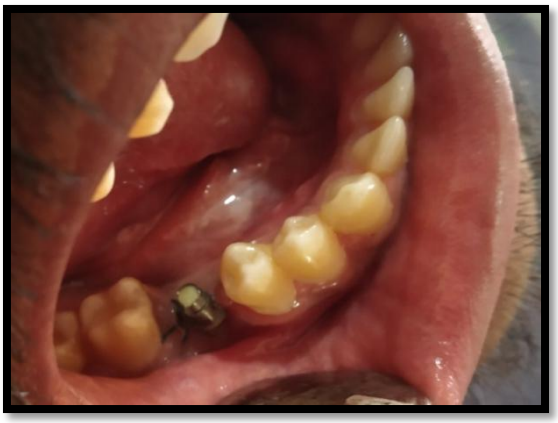


Fig- 15: PHOTOGRAPH SHOWING ABUTMENTS PLACED 46

Fig- 16: PHOTOGRAPH SHOWING FINAL PROSTHESIS

III. Results

A study was conducted to clinicallyevaluate periodontal parameters around immediate implant with and without PRF.In our study 30 implants were placed 8 were males and 7 females and randomly divided into two groups, Group I (Immediate dental implants without platelet rich fibrin n-15) and Group II (Immediate dental implants with platelet rich fibrin n-15).

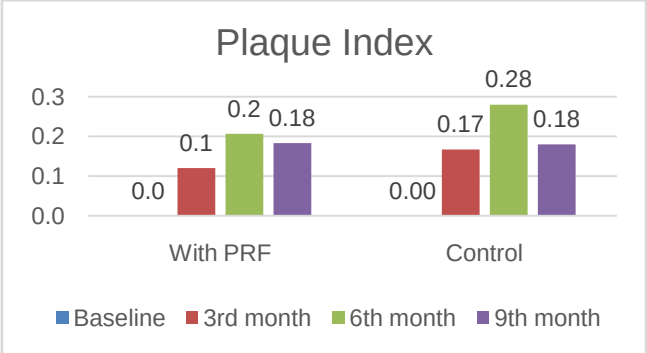
The following parameters were recorded for both groups at different interval of time at baseline (after implant loading), 3rd month, 6th month and 9th month post operatively such as Plaque Index, Gingival Index (GI)**,**Probing depth (PD)**,** Width of keratinized mucosa **.**Final prosthesis was delivered at 3rd month.

Table 1. Intergroup comparison of plaque index

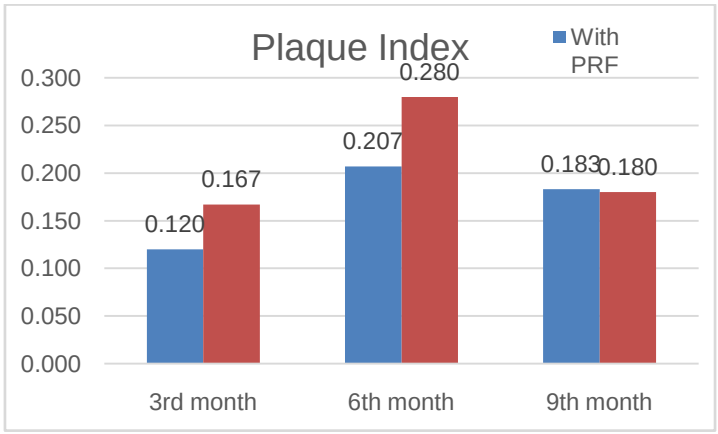
Parameter		Mean	SD	T	P
Plaque index at baseline	**With PRF**	**0**	**0**	**0**	**1.0**
	Control	**0**	**0**	**0**	**1.0**
Plaque index at 3rd month	**With PRF**	**0.120**	**0.04**	**-2.82**	**0.008****
	Control	**0.167**	**0.05**		
Plaque index at 6th month	**With PRF**	**0.201**	**0.05**	**-3.16**	**0.004****
	Control	**0.280**	**0.08**		
Plaque index at 9th month	**With PRF**	**0.183**	**0.04**	**0.144**	**0.88***
	Control	**0.180**	**0.08**		

Unpaired t test. * Non-significant difference (p-value ≥ 0.05); **Highly significant difference (p - value ≤ 0.01)

Graph 1. Intra group representation Eof Plaque index for test and control group



Graph 2.Representation of inter group (test vs. control) comparison of Plaque index at different time interval



CLINICAL PARAMETERS:

Plaque index:

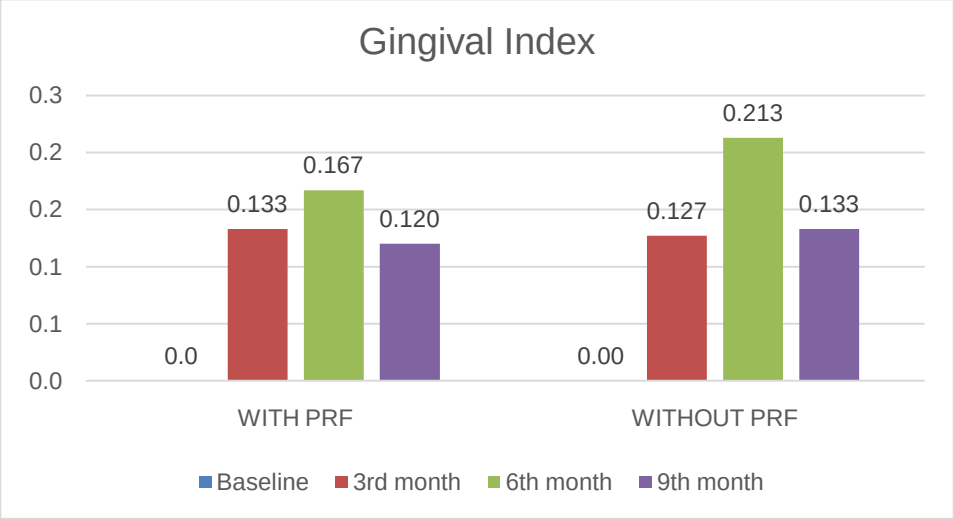
Table 1 and Graph 2shows representation of inter group (test vs. control) comparison of Plaque index at different time interval .Intra group representation of Plaque index for test and control group shows that the mean values of plaque index showed an increase from 3rd to sixth month and then decreased in 9th month. This pattern was observed in both the test (with PRF) and control (without PRF) group**.**

Table 2. Intergroup comparison of Gingival Index

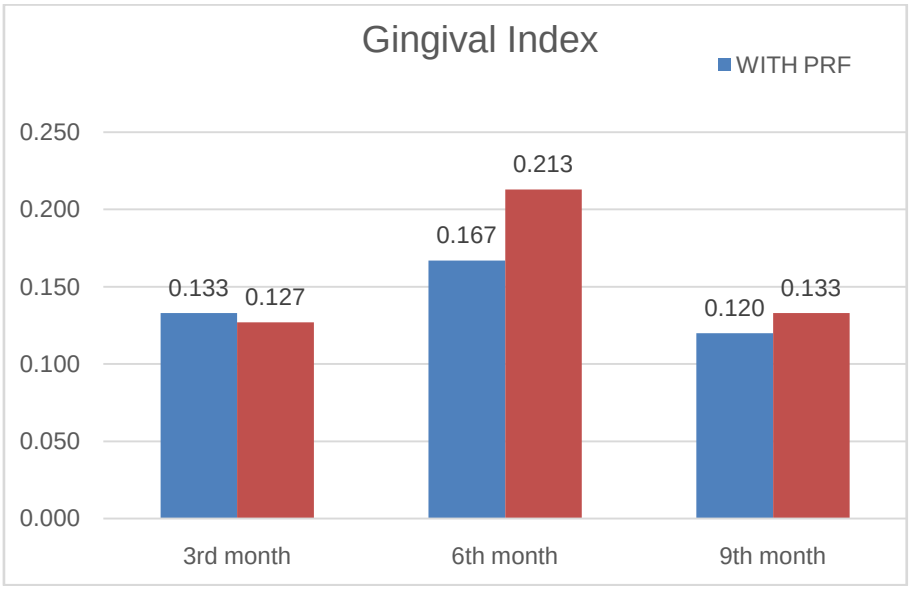
Parameter		Mean	SD	T	P
Gingival index at baseline	**With PRF**	**0**	**0**	**0**	**1.0**
	Control	**0**	**0**		
Gingival index at 3rd month	**With PRF**	**0.133**	**0.05**	**0.386**	**0.70**
	Control	**0.127**	**0.05**		
Gingival index at 6th month	**With PRF**	**0.167**	**0.05**	**-3.00**	**0.01**
	Control	**0.213**	**0.04**		
Gingival index at 9th month	**With PRF**	**0.120**	**0.04**	**-0.8**	**0.43**
	Control	**0.133**	**0.05**		

Unpaired t test. * Non-significant difference (p-value ≥ 0.05); **Highly significant difference (p - value ≤ 0.01)

Graph 3 .Intra group representation of Gingival index for test and control group



Graph 4.Representation of inter group (test vs. control) comparison of Gingival index at different time interval



Gingival index:

Table 2 and graph 3 and graph 4 shows:

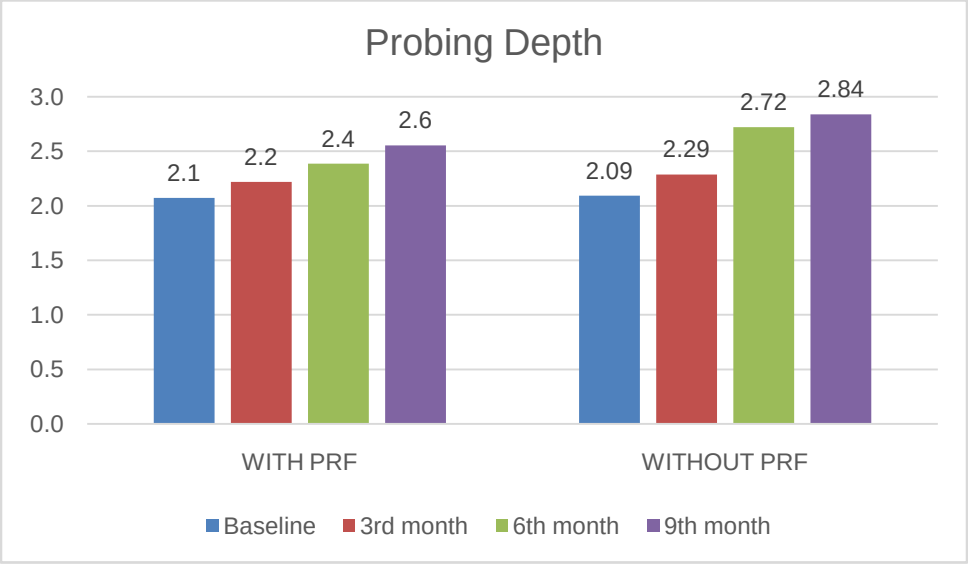
The intragroup comparison of gingival index is represented in Figure 1 and 2.It was found that the mean values gingival index showed an increase from 3rd to sixth month and then decreased in 9th month. This pattern was observed in both the test (with PRF) and control (without PRF) group

Table 3. Intergroup comparison of Probing Depth

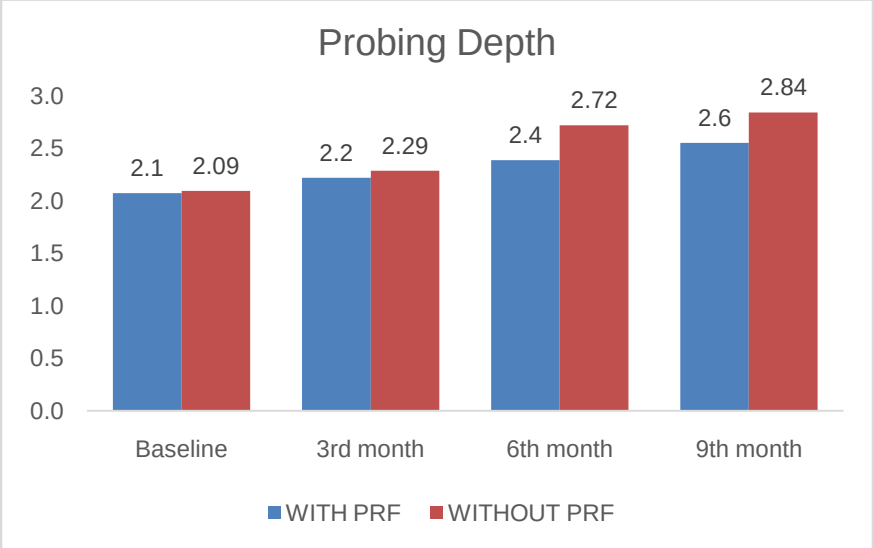
Parameter		Mean	SD	t	P
Probing Depth at baseline*	**With PRF**	**2.07**	**0.11**	**0.47**	**0.64**
	Control	**2.09**	**0.12**		
Probing Depth at 3rd month *	**With PRF**	**2.22**	**0.14**	**0.59**	**0.56**
	Control	**2.29**	**0.41**		
Probing Depth at 6th month***	**With PRF**	**2.39**	**0.12**	**2.70**	**0.01**
	Control	**2.72**	**0.46**		
Probing Depth at 9th month**	**With PRF**	**2.55**	**0.14**	**2.52**	**0.02**
	Control	**2.84**	**0.42**		

Unpaired t test. * Non-significant difference (p-value ≥ 0.05); **Highly significant difference (p - value ≤ 0.01)

Graph 5. Intra group representation of Probing Depth for test and control group



Graph 6 .Representation of inter group (test vs. control) comparison of Probing depth at different time interval



Probing depth:**Table3 and graph 6 shows:**

The intergroup comparison of test group and control group for the two parameters, viz, Probing depth and width of keratinized gingival observed at different time interval is presented in table 3 and Table 4 represented diagrammatically in graphs 6 and 8 respectively.

Intergroup comparisons revealed that for Probing depth all mean values obtained for test group (with PRF) in all months were lower than the control group (without PRF) values. At baseline and during 3rd month mean obtained for test group is almost similar that of control groupat 3rd month, however, at 6th and 9th month, the values of test group (with PRF) was significantly lower than the control group.

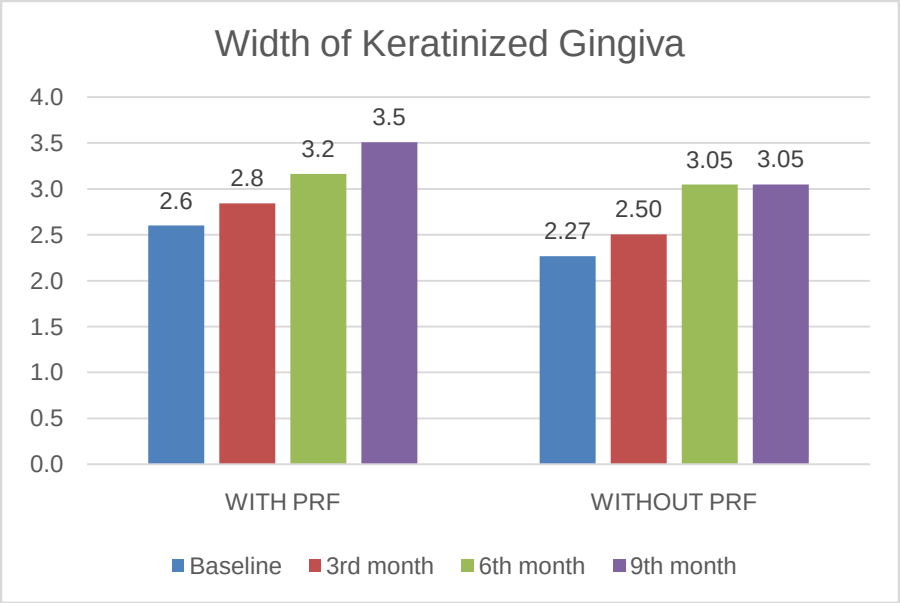
The intragroup comparison of probing depth and width of keratinized gingival is represented in **Graph 5 and Graph 7**. It was found that the mean values of both the parameters increased from baseline to 9th month. This pattern was observed in both the test (with PRF) and control (without PRF) group**.**

Table 4. Intergroup comparison of Width of Keratinized Gingiva

Parameter		Mean	SD	t	P
Width of Keratinized Gingiva at baseline**	**With PRF**	**2.59**	**0.32**	**3.15**	**0.004**
	Control	**2.27**	**0.23**		
Width of Keratinized Gingiva at 3rd month **	**With PRF**	**2.84**	**0.39**	**2.88**	**0.007**
	Control	**2.50**	**0.24**		
Width of Keratinized Gingiva at 6th month*	**With PRF**	**3.16**	**0.18**	**2.35**	**0.03**
	Control	**3.05**	**0.02**		
Width of Keratinized Gingiva at 9th month ***	**With PRF**	**3.51**	**0.14**	**12.60**	**0.000**
	Control	**3.05**	**0.02**		

Unpaired t test. * Non-significant difference (p-value ≥ 0.05); **Highly significant difference (p - value ≤ 0.01)

Graph 7. Intra group representation of width of Keratinized Gingiva for test and control group



Graph 8.Representation of inter group (test vs. control) comparison of Width of Keratinized Gingiva at different time interval

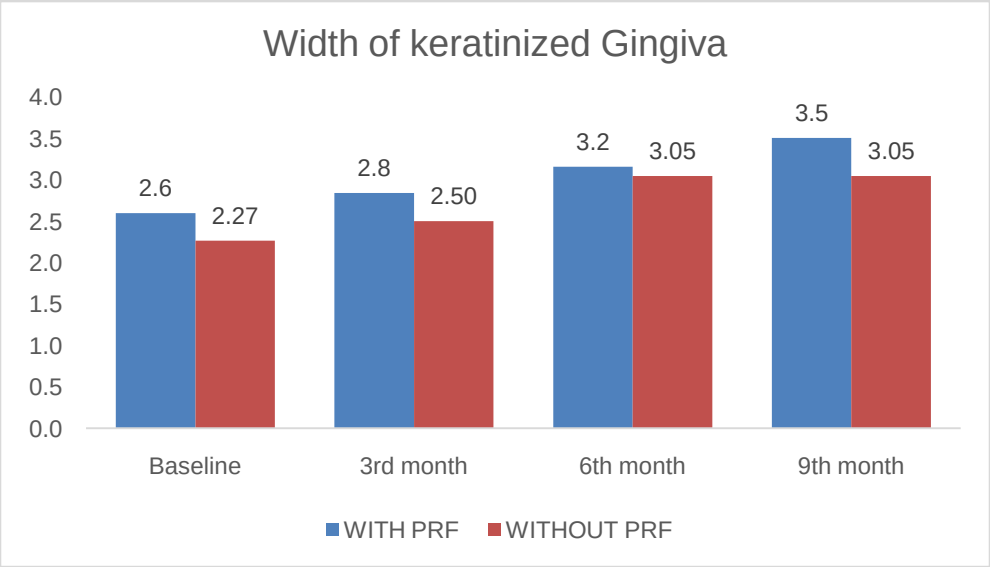


Table 4 and Graph 8 shows Intergroup comparison of Width of Keratinized Gingiva

The intragroup comparison of probing depth and width of keratinized gingival is represented in **Graph 5 and Graph 7**. It was found that the mean values of both the parameters increased from baseline to 9th month. This pattern was observed in both the test (with PRF) and control (without PRF) group**.**

The intergroup comparison of test group and control for the two parameters, viz, Probing depth and Width of Keratinized gingiva observed at different time interval is presented in table 3 and table 4 and represented diagrammatically in Graph6 and 8, respectively.

Intergroup comparisons revealed that for Probing depth all mean values obtained for test group (with PRF) in all months were lower than the control group (without PRF) values. At baseline and during 3rd month mean obtained for test group is almost similar that of control group; however, at 6th and 9th month, the values of test group (with PRF) was significantly lower than the control group. Intergroup comparisons of mean values of width of keratinized gingival at baseline and 3rd month . The intergroup comparisons revealed that all mean values obtained for all test group(with PRF) are higher than control group in all months.

A reverse relation was seen with the width of Keratinized gingiva; all test values (with PRF) were significantly higher than the control values (without PRF) during all months.

IV. Discussion:

The benefits of immediate implant insertion after tooth extraction are, elimination of post-extraction healing period, reduced number of surgical sessions, preservation of alveolar width and height, reduction of alveolar resorption, better final rehabilitation, maintaining the natural tooth angle, lower risk of dehiscences or fenestrations around dental implant, better angulation leading to improved esthetics and axial occlusal loading and improved surgical orientation relative to pertinent anatomical structures[8]. Along with many benefits of immediate implant , some technical complications have been described regarding this technique. A gap between the implant surface and the bone walls of the socket may occur &challenges in terms of predictably obtaining soft-tissue coverage over the implant site[9] Soft-tissue grafting techniques have often been used for use during immediate implant placement to augment soft-tissue deficiencies .So to overcome these complications resorbable and non-resorbable membranes, connective tissue grafts and collagen derived scaffold are used. Few limitations like second surgical site, technique sensitivity, patient morbidity associated with procurement ofautogenous connective tissue grafts led to new advancement as introduction of biomimetic agents such as platelet rich fibrin(PRF) have given new promises for better implant treatment .

Platelet rich fibrin(PRF) has been recently used as a biodegradable regenerative material(2001) to aid for promoting hard and soft tissue regeneration. In combination with immediate implant placement, PRF offers an easily procurable low-cost& less technique sensitive regenerative modality that offers an efficient way to improve soft-tissue attachment around implants[10].

Platelet Rich Fibrin (PRF) is a concentrated suspension of growth factors found in platelets. These concentrates contains high levels of growth factors including PDGF (platelet derived growth factors), transforming growth factors β1 and β2 (TGF β1, β2),vascular endothelial growth factors (VEGF), platelet derived endothelial growth factors, Interleukin 1&2, basic fibroblast growth factor (β-FGF), platelet activating factor 4 (PAF-4)[11]. The cascade of reaction involves immediate binding of secreted growth factors to the trans-membrane receptors present on the external surface of cell membranes in graft, flap or wound. This result in activation of an endogenous internal signal protein, which further initiate the expression of a normal gene sequence of cell such as matrix formation, cellular proliferation, osteoid production, and collagen synthesis. Synergistic role of these platelets derived factors in bone and soft tissue healing has been reported in literature.

Various studies have been conducted on PRF and its clinical application in various disciplines of dentistry. PRF is used for continuity defects, sinus lift augmentation, horizontal and vertical ridge augmentations, ridge preservation grafting, periodontal defects, cyst enucleation, healing of extraction wounds, endodontic surgeries and to treat gingival recession. All these studies showed that PRF is a healing biomaterial for both soft and hard tissue because of the presence of various growth factors[12]. To the best of our knowledge, there are very few studies that have shown the effect of PRF on periimplanthard and soft tissue changes. PRF has been studied mainly for the purpose of bone augmentation and soft tissue healing at other sites. However PRF's potential to minimize crestal bone loss has not been investigated specifically.

The present study was conducted to clinically evaluate the periodontal parameters around immediate implants. A total of 30 fresh extraction sites in the age group of 18-65 years visiting the out-patient department of periodontics, Himachal Dental College, Sundernagar (H.P) were selected for the present study. All subjects satisfying the inclusion criteria were informed about the nature of the study and their informed consent were taken. Patients were equally divided into two groups.Group I (Fifteen dental implants without platelet rich fibrin),Group II (Fifteen dental implants with platelet rich fibrin).None of the 30 implants failed after 9 months of implant placement .In the present study, in order to observe the plaque score on implant surface Plaque index described by **Silness P. &Loe H. (1964)** was used. This parameter was recorded at baseline, 3rd,6th ,9th month. On intragroup comparison of mean difference of plaque index in **Group I** and **Group II(** Table I**,** Graph I) showed slightly higher plaque index in baseline to 3rd month intervals then baseline to 6thmonth and 3rdmonth to 6th month and this difference was found to be statistically non-significant. The lack of oral hygiene maintenance resulted in higher plaque score immediately after the implant placement. But repeated oral hygiene instructions given to patients throughout the follow up study period could be the reason of improved plaque score thereafter. The fair plaque score is also attributed to the highly polished titanium surface of the gingival collar part of the implant that is resistant to plaque accumulation. On intergroup comparison of mean difference of plaque score between **Group I** and **Group II(**TableI.Graph 2) showed slightly higher plaque index for **Group I** during the initial follow up period as compared to **Group II** This may be due to the lack of oral hygiene maintaince immediately after implant placement. . The difference of mean plaque difference between two groups was found to be statistically non-significant.

In the present study gingival index was assessed using index given by **Loe H. and Silness P. (1963)** for the purpose of assessing the severity of gingivitis and examining the qualitative changes of the gingival soft tissue. On intragroup comparison, the mean difference of gingival index scores for **Group I**&**GroupII(**Table 2, Graph 3) showed slightly higher gingival index score for baseline to 6thmonths interval than from baseline to 3rdmonth and 3rdmonth to 6thmonth interval. This difference was found to be statistically non-significant. These

results showed very mild inflammatory reaction, as reflected by the low gingival index scores throughout the periods of observation. This would be due to the oral hygiene instructions and measures, which the patients followed during the study periods. Also there was decrease in mean difference of gingival index score from 3rd month to 6th month period in **Group I** which signifies which reflects a healthy Osseo-integration whereas in **Group II** the value remains same as during 1st to 6th month period. On intergroup comparison, the mean difference of the gingival index between **Group I**&**Group II**, and **Group I** showed slight higher Gingival index score from baseline to 3rd month and from baseline to 6thmonth when compared to **Group II**. This may be due to lack of oral hygiene maintence in the **Group I** than **Group II**, immediately after the implant placement. The mean difference was found to be statistically non-significant.

Clinical probing is regarded as an important and reliable diagnostic parameter in the continuous monitoring of both periodontal and peri-implant tissues around implants. As peri-implant tissue are more sensitive than the tissue around natural teeth, so less force is applied during peri-implant probing (0.2-0.3N). On intragroup comparison of the mean difference of probing depth for **Group I**&**GroupII(**Table 3, Graph 5**)** showed that both the groups had slightly higher probing depth at 3rdmonth to 6th month interval than from baseline to 3rdmonth and baseline to 6thmonth interval.This difference was statistically non-significantindicating that the implant mucosa was kept in healthy condition throughout the study period. This increase in the probing depth after 3rdmonth signifies the bone loss which could be the result of physiologic response to the micro-gap/interface at the connection to the superstructure i.e. between implant and abutment, it has been demonstrated that bacteria are present in such micro-gaps (interfaces), may form a reservoir and that the host reacts with an inflammatory response which may have resulted in the tissueloss . Also the reason for bone loss could be the stress accommodation of the bone after loading.Many studies reported that the probing depth (PD) alone is not reliable enough to follow the peri-implant soft tissue levels over time, since it can be influenced by changes in the gingival anatomy. The study of **Schou et al. (2002)**whose results were in accordance with our study, reporting deeper penetration of the probe around implants as compared to teeth, even with low degrees of inflammation.. On intergroup comparison, the mean difference of the probing depth between **Group I**&**Group II**(Table 3, Graph 6) showed that, **Group I** had slightly higher probing depth than **Group II** during 1st to 3rd month and 3rd to 6th month period.. The decrease in the probing depth till 6th months follow up was noted in the **Group II** could be attributed to the reaction of marginal soft tissue to the superstructure system However the results were statistically non-significant for the both the groups, **(**, the mean probing depth was >5 mm in 4.5% of cases and the survival rate of implants was 100%. In our study, the probing depth was < 3mm for both groups with 100% survival rate.

The width of the keratinized mucosa was measured(Table 4, Graph 7, 8) at the mid-facial aspect of each implant using UNC 12 plastic probe. Each measurement was made from the gingival margin to the mucogingival junction. In the present study, on intra-group comparison the mean difference of width of keratinized gingiva showed that in **Group I** the mean difference of width of keratinized gingiva was slightly higher in baseline to 3rd month and baseline to 6th month interval than 3rdmonth to 6thmonth interval and this difference was found to be statistically non-significant. **Group II** showed slightly higher mean difference of width of keratinized gingiva in baseline to 6thmonth than in baseline to 3rd month and 3rd month to 6thmonth and this difference were found to be statistically non-significant. However, the width of keratinized gingiva was adequate (i.e.>2mm) at different time intervals for both groups at different time intervals. This is in accordance with an observational study by, **Lang and Loe (1972)**who suggested that a width of at least 2 mm of keratinized mucosa (KM), of which 1 mm was to be attached gingiva is adequate until the oral hygiene is maintained. In the present study, all the sites in which implant were placed had an adequate width of keratinized gingiva throughout the healing period of implant contributing to aesthetically pleasing and biologically sound results. On intergroup comparison, the mean difference of width of keratinized gingiva between **Group I** and **Group II**(Table 4 , Graph 8) was observed and found that the **Group I** had slightly higher width of keratinized gingiva(i.e. from baseline to 6th month and from 3rd month to 6thmonth) than **Group II**. In both groups the width of keratinized mucosa decreased after 3rd month but no significant differences were found between groups. These results concur with the results of studies carried out by **Bouri et al. (2008)**, who observed that wider zone of keratinized mucosa (>2 mm) had less plaque accumulation and mucosal inflammation. Also**Chung et al. (2006)**showed that mucosal inflammation and plaque accumulation were significantly higher around implants with KM <2mm and or attached mucosa <1mm. The wider zone of KM was more resistant to forces of mastication and frictional contact that occurs during oral hygiene procedures. This is consistent with present study result because there was neither severe gingival tissue loss nor inflammation was noted between groups throughout the study period.

V. Conclusion

The immediate implant placement into extraction socket seems to be safe and predictable method. Main advantages of immediate implants are elimination of post-extraction healing period, reduced number of surgical sessions, preservation of alveolar width and height, reduction of alveolar resorption, better final rehabilitation, maintaining the natural tooth angle, lower risk of dehiscences or fenestrations around dental implant, better angulation leading to improved esthetics and axial occlusal loading and improved surgical orientation relative to pertinent anatomical structures Immediate implant placement is a well-accepted treatment modality that has been shown to have high cumulative survival rates ranging 92-100%. In the present study platelet-rich fibrin (PRF) has been used as regenerative material. In combination with immediate implant placement, PRF offers an easily procurable low-cost& less technique sensitive regenerative modality that offers an efficient way to improve soft-tissue attachment around implants.

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