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Clinical and Radiographic Comparison of Bone Fill using Autogenous Bone Graft and Hydroxyapatite Bone Graft combined with Autologous Platelet Rich Fibrin in the treatment of Grade 2 Furcation defects.

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Abstract:

Introduction: Platelet rich fibrin is a concentrated suspension of growth factors, which is used to promote periodontal tissue regeneration. Hydroxyapatite (HA) permit outgrowth of osteogenic cells from existing bone areas to fill the furcation defects. The aim of the present study was to clinically and radiographically evaluate the efficacy of autogenous bone graft combined with autologous platelet rich fibrin (PRF) (Group I) and Hydroxyapatite bone graft combined with autologous platelet rich fibrin (Group II) in augmenting the bone fill of Grade II furcation defects in Mandibular molars.

Materials and Methods: A total of 30 patients with Grade II furcation defects in mandibular molars were divided into Group I, treated with autogenous bone graft combined with autologous platelet rich fibrin and Group II with Hydroxyapatite combined with autologous platelet rich fibrin after ethical clearance. At baseline and 6 months after treatment, Vertical Probing Depth (VPD) Vertical Depth of The Furcation Defect (V1, V2) Horizontal Probing Depth of Furcation Defect(H1,H2) Clinical attachment level (CAL) were evaluated.

Results: The mean value of the amount of furcation defect fill after 6 months using 1x1mm grid RVG is 5.06±0.89mm ($P<0.001$) in autogenous bone graft combined with autologous platelet rich fibrin (Group I) and 3.93 ± 0.70mm ($P<0.001$) in Hydroxyapatite combined with autologous platelet rich fibrin (Group II). With statistically significant bone fill in group I.

Conclusion: Autogenous bone grafts with PRF have better regenerative potential than hydroxyapatite bone graft with PRF in class II furcation defects in Mandibular molar region.

Keywords: Bonegrafting, Furcation defects, Platelet rich fibrin, Periodontal regeneration, Auotgenous bone graft, Hydroxyapatite

INTRODUCTION

Periodontal disease affecting the multirooted teeth often causes difficulty to treat furcation areas due to complexity of its morphology. [1,2] Accustomed treatment measures and periodontal procedures are not sufficient to keep the furcation area free of local factors and therefore specialized procedures such as Resective surgeries which includes root resection, hemisection, and reconstructive treatments like bone grafting, guided tissue regenerative procedures or a combination therapy are used. [1] Selection of different procedures depends on the stretch of furcation involvement. The bone graft can be an autograft, allograft, xenograft or alloplast.

Autografts is considered as gold standard and particulate type or bone block type can be accumulated. [3] The osteogenic, osteoinductive and osteoconductive properties of the Autogenous graft are due to the undifferentiated cells and bone formation inducing osteoblast cells. [4,5] The synthetic bone substitute alloplasts have numerous advantages over other materials like, unlimited availability, storage potential, no risk of disease transmission and no need for second surgical site. Hydroxyapatite (HA) bone grafts used to fill periodontal intrabony defects, permit outgrowth of osteogenic cells from existing bone areas to the bone surrounding it. [5] It is osteoconductive and clinically well tolerated with no reported allergic reactions due to absence of organic components. Platelet Rich Fibrin (PRF) is a second-generation concentrate of platelets with inherent advantages over Platelet Rich Plasma (PRP). [3]

The fibrin clot can be manipulated into a dense fibrin matrix membrane that can be trimmed, adapted and sutured easily. The presence of high amount of Transforming Growth Factor 1β (TGF1β), Vascular Endothelial Growth Factor (VEGF), Platelet Derived Growth Factor (PDGF) in PRF assists proper healing of the wound and promotes tissue regeneration making it an excellent barrier membrane in furcation defects treatment. [3,4]

There are very few studies on the furcation defects and also on the usage of PRF combined with bone grafts. [6,7,8] The aim of the present study is to clinically evaluate the efficacy of autogenous bone graft combined with autologous platelet rich fibrin (PRF) and Hydroxyapatite bone graft combined with autologous platelet rich fibrin in augmenting the bone fill of Grade II furcation defects in Mandibular Molars by measuring the vertical and horizontal probing depth and radiographically assess the defect fill by using radiovisiography (RVG) with millimeter grid scale.

MATERIALS AND METHODS

In this double-blind randomized clinical trial, 30 mandibular molars with horizontal probing depth of ≥ 3 mm using Naber's probe (grade II furcation involvement based 1953 Glickman's classification) [9], who were referred to the Department of Periodontics, G.Pulla reddy dental college and hospital, for the treatment of periodontal disease, from November 2015 to November 2017 were included. The nature of this investigation was explained in detail and written and verbal consent was obtained from the selected patients. The study protocol was approved by the Institutional Ethical Committee and Review Board with Ethical Approval Number GPRDCH/IEC/2016/013.

Inclusion criteria:

- Clinically detectable GradeII furcation involvement in mandibular first molars.
- Probing depth of ≥5mm in the William's calibrated periodontal probe and horizontal probing depth of ≥3mm in the Naber's colour coded probe.
- Radiolucency in the furcation area of mandibularmolars
- Exclusion criteria:
- Patients with any systemic illness
- Patients under long term medications such as corticosteroids or calcium channel blockers
- Immuno compromised individuals
- Patients with advanced periodontal destruction
- Patients with poor oral hygiene even after phase I therapy
- Pregnant and lactating women
- Patients using tobacco in any form

Based on the inclusion criteria 30 patients were selected and were divided into two groups of 15 each based on coin toss method.

Group I - consisting of 15 patients with furcation defects in mandibular molar treated with autogenous bone graft material combined with autologous platelet rich fibrin.

Group II – consisting of 15 Patients with furcation defects in mandibular molar treated with Hydroxyapatite bone graft material combined with autologous platelet rich fibrin.

Stent preparation:

Individually fabricated occlusal stents were made for the standardization of measurements. Alginate (DPI Algitex) impressions were made for each patient and the study models were prepared with type II dental stone. Self-cure acrylic was adapted over the premolar and molar area covering the occlusal and 1/3 of the buccal and lingual teeth surfaces. Orthodontic wire was incorporated into the stent which extended from the distal interproximal area of the involved tooth directed towards the furcation entrance and vertical groove is prepared to measure vertical bony defect guiding with stainless steel wire. [Figure 1] Border of the acrylic stent and tip of stainless wire served as a FIXED REFERENCE POINT (FRP), to record the measurements.

Clinical parameters:

1. Plaque Index[10]
2. Gingival Index[11]
3. Periodontal disease index[12]

Vertical probing depth:(VPD)

VPD was calculated by measuring the distance from a FIXED REFERENCE POINT (FRP) on the stent to the BASE OF THE POCKET (BOP) along the groove prepared on the stent using the Williams periodontal probe and subtracting it by the distance from the FRP to the GINGIVAL MARGIN (GM) [Figure 1]

VPD=(FRP –BOP) −(FRP–GM [15]

Vertical depth of the furcation defect:

Vertical depth of bony defect is measured from inferior margin of stent to the bone crest at the furcation defect by transgingival probing. [9]

V1=Preoperative vertical depth measurement

V2=Postoperative vertical depth measurement (after 6 months)

Horizontal probing depth of furcation defect:

Horizontal probing depth was measured using a customized Naber's probe calibrated in millimeters. The pointed end of the orthodontic wire served as the reference point by transgingival probing.

H1=Preoperative horizontal probing depth measurement

H2=Postoperative horizontal probing depth measurement (after 6 months)

Clinical Attachment Level (CAL):

Clinical attachment level (CAL) was calculated by measuring the distance from the FRP to the BOP and subtracting it by the distance from the FRP to the cementoenamel junction (CEJ).

CAL = (FRP – BOP) −(FRP– CEJ)[Figure2] [15]

In addition to the clinical parameters, radiographic parameters were evaluated using Digital RVG with grid as an additional method to observe the possible changes in the furcation region at baseline and after 6 months postoperatively.

Radiographic procedure:

Radiovisiography (RVG) was taken using long cone paralleling angle technique. Study subjects were made to wear lead apron and thyroid collar before exposure. Subjects were then positioned upright in the chair with proper back support. The X ray unit settings and tube head angulations

were adjusted according to the region of interest. Grid, holding devices and aiming ring were used to standardize the technique. [Figure 3]

PRF Preparation: Ten millilitres of intravenous blood [Figure 4] was drawn by venipuncture at the antecubital fossa and was transferred into a 10 ml sterile tube without anticoagulant and centrifuged at about 3,000 rpm for 10 minutes. After coagulation, the fibrin clot present in between the acellular plasma on the top and the red blood cells at the bottom were separated using sterile tweezers and scissors. [Figure 5] [13]

Surgical Protocol

Local anesthesia was administered using infiltration/nerve block technique. Intra sulcular incisions were given with no. 15 blade to raise a full thickness mucoperiosteal flap to expose the furcation defect. [Figure 6] Granulation tissue was debrided; root surface was thoroughly scaled and planed with manual instrumentation (Hu-Friedy Gracey and furcation curettes). Root conditioning done using tetracycline hydrochloride. The surgical site was regularly rinsed with normal saline.

Group I: The PRF was prepared following the Choukroun protocol. [13] Autogenous particulate bone grafts harvested from mandibular retromolar region and milled using bone mill. [Figure 7,8,9] [14] The bone chips were immersed in the prepared PRF [Figure 10] and then tightly packed to fill furcation defect. [Figure 11] The mucoperiosteal flaps were repositioned to cover the furcation area and secured by interrupted sutures using 3-0 non absorbable black silk surgical suture. [Figure 12]

Group II: Flap was elevated and Hydroxyapatite (HA) (Osseograft™) graft material was dispensed into a sterile dappen dish and mixed with platelet rich fibrin. [Figure13,14] The graft

was gently packed into the furcation area until the defect was filled, overfilling was avoided, the flap was approximated and sutured. [Figure 15,16]

The surgical area was protected and covered with periodontal dressing (Coe-Pack). Post-operatively, Systemic antibiotics (amoxicillin 500 mg, three times daily) and analgesics (Aceclofenac 100 mg and Paracetamol 325 mg thrice daily) were prescribed for 5 days. Suture and periodontal dressing were removed one week after surgery. The operated area was rinsed carefully with normal saline. Pre operative and post operative (after 6 months) RVG's were advised for both Group I & II in the defect area [Figure 17,18,19,20] and patients were recalled after 1,3 and 6 months postoperatively for re-evaluation.

Statistical analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 software (IBM SPSS, IBM Corp., Armonk, NY, USA). Descriptive statistics, independent samples t-test, repeated measures Analysis of Variance (ANOVA), and Paired t-tests were used in data analysis. For all the analysis, p-value <0.05 was considered statistically significant.

RESULT

A total of 30 Grade II furcation defects in 30 patients [15] were treated. The average age of the patients was 46.5 yrs in Group I and 48.5 yrs in Group II, Out of 30 sites 20 sites were treated in males and 7 sites were treated in females [Table.1]. In the Inter group comparison, for Group I, the mean vertical measurement of furcation defect, Horizontal measurement of furcation defect and Clinical attachment level was 8.0±0.88mm, 6.1±0.99mm, 7.8±1.06mm at baseline and 3.7±0.703mm, 3.6±0.828mm, and 3.4±0.639mm after 6 months of treatment [Table 2]. And for GroupII, the mean vertical measurement of furcation defect, Horizontal measurement of

furcation defect and Clinical attachment level was 7.5±0.74mm, 6.2±0.45mm, 6.7±0.79mm at baseline and 3.4±0.51mm, 3.7±0.59mm, 3.8±0.63mm after 6 months of treatment [Table 3]. Plaque index, Gingival index, Periodontal disease index (clinical parameters) were evaluated at baseline and 6 months with significant P value (<0.0001) and there was almost equal values in both the Groups with effective regenerative materials. [Table.4/Graph.1] Upon comparison between two groups the vertical and horizontal measurement of furcation defect and the clinical attachment level was found to be significant at the end of 6 months post-operatively with significantly greater results in Group I [Table.5/Graph.2]. Statistically significant bone fill was observed in both the groups with Group I showing better results. Comparison of the mean value of RVG measurements of Furcation defect area from the furcation fornix to base of the defect at Baseline and after 6 months of treatment using 1x1 mm grid was 7.6±0.8mm, 2.6±0.8mm in Group I and 9.4±5.3mm, 5.6±3.9mm in Group II. [Table.6/Graph.3] The percentages of bone fill 6 months after treatment for Group I was around 67.4% and 36.8 % for group II. [Table.7/Graph.4]

DISCUSSION

In present study, 30 sites with grade II furcation invasion were treated with autogenous bone graft combined with PRF in Group I and Hydroxyapatite (HA) bone graft combined with PRF in Group II to evaluate bone fill in mandibular molar grade II furcation defects. All the clinical Parameters like Plaque index, Gingival index, Periodontal disease index were almost similar at baseline and after 6 months in both the groups upon Intra group comparison.

The Vertical, Horizontal measurement of Grade II Furcation Defect area and the clinical attachment level at baseline and 6 months after surgical intervention showed superior results in Group I (Autograft + PRF) than Group II (HA+PRF).The Percentage of Radiographic Bone fill was 67.4% in Group I and 36.8% in Group II at the end of 6 months from surgical intervention showing that the amount of Mean Radiographic bone fill was statistically significant and greater in Group I compared to Group II.

In present study bone was harvested from mandibular retromolar region with trephine burs of different diameters. Advantages of using mandibular retromolar area provides a cortical graft which requires a short healing period, about 4 to 6 months, and shows minimal resorption inbone volume while providing a high-density bone quality and harvesting procedure is safe and minimal discomfort to the patient.[14] The present study outcome is in accordance to the studies done by Ardeshair Lafzi [15] and Ashish Mathur [16] where they harvested bone graft from adjacent sites and observed a significant improvement in clinical parameters and radiographic parameters and gain of bone in furcation area and intra bone defects indicating the better regenerative potential of autogenous grafts. Ronaldo Santana [17] compared use of combine regenerative therapy and open flap debridement (OFD) alone in mandibular grade II furcation defects. A mean improvement of the vertical CAL after 12 months of follow-up was 3.1 mm. Similarly, the mean horizontal attachment level gain was 3.5 mm as in the present study.

Aimetti [18] conducted treatment of Class II furcation defects in mandible with enamel matrix derivative combined with autogenous bone graft, after 24 months CAL was reduced to 2.2 mm, the vertical probing attachment level was reduced to 3.6 mm, and the horizontal probing attachment level was reduced to 3.4 mm similar to the present study. The outcome of this study matches with findings done by Chitsazi [19] and Bhatia [20] they observed that the clinical and

radiographic parameters in furcation defects treated with hydroxyapatite bone graft combined with PRF yielded better results. In a comparative analysis of PRF and Nova bone in class II furcation defects by Biswas [21] CAL gain was 3.7± 0.11 mm and 2.1± 0.12 mm respectively 6 months post operatively similar to the outcome of present study indicating that PRF as a better regenerative material. The mean reduction in the vertical probing depths was highly significant in both group I and group II, 6 months postoperatively. Initial vertical probing depth for group I was 7.8mm which was reduced to 3.4mm while in group II initial probing depth of 7.9 mm reduced to 3.5 mm, 6 months post intervention.

In study by Debnath [22] evaluated the clinical efficacy of hydroxyapatite–bioactive glass (HA:BG) composite granules in the management of defects in periodontal bone and reported Probing Pocket Depth (PPD) reduction of 3.4 ±0.8mm similar to this study. The present study is in contrary to results of Ashawan [23] where in those authors reported statistically non-significant difference in CAL for sites treated with BG+PRF and BG alone. The variation can be due to the geometry of the defects and evaluation of regeneration. Statistically significant CAL gain in Group I compared to Group II might have been the result of true periodontal regeneration via new attachment in the case of PRF. The percentage of bone fill in the present study is found to be statistically significant in group I (67.4%) compared with group II (36.8%) at 6 months. Group I exhibited a greater bone fill compared to group II indicating that autogenous bone graft combined with PRF have the better regenerative potential to Hydroxyapatite combined with PRF. The lesser bone fill in group II is probably attributable due to the less resorption rate of Hydroxyapatite bone graft which further affects the late remodeling of new bone formation.

Limitation of the present study

1. Small sample size.

2. Shorter follow up duration.
3. Surgical reentry was not done.
4. Selection of specific sites alone (Mandibular molars only). Maxillary Molars and multirooted premolars can also be selected.
5. Selection of class II furcations only.

Comparison of Various Studies

Sl no.	Author's name and year	Place of study	Number of subjects	Techniques compared	Parameters assessed	Conclusion
1	Present Study	G.PullaReddy Dental College & Hospital, Kurnool. INDIA	30 subjects with Grade II Furcation Defects	Autogenous Bonegraft (ABG) with PRF and HA Bone Graft with PRF	Vertical Probing depth, Horizontal Probing depth, Clinical Attachment level.	Statistically Significant bone fill in Autograft + PRF Group compared to HA+ PRF Group.
2	Bhatia G 2018 [20]	Teerthanker Mahaveer Dental College and Research Centre, Moradabad,	10 subjects with Intrabony defects.	PRP + Hydroxyapatite (HA) (test sites) or HA alone	Probing pocket depth and Clinial attachment level.	PRP in addition to HA bone graft in the treatment of intrabony defects shows improved defect fill as compared to the use of HA alone
3	Biswas S 2016 [21]	Rajarajeshwari Dental college &Hospital, Karnataka.	15 subjects with 20 class II Furcation	Bioactive glass bone graft putty (Novabone) and PRF.	Vertical and Horizontal probing depths.	Bioactive glass osteo stimulative biomaterial yields superior clinical results, including

			defects.			increased pocket depth reduction of class II furcation defects as compared to an autologous platelet concentrate.
4	LafziA. 2013 [15]	Tabriz University of Medical Sciences	30 subjects with Grade II Furcation Defects	ABG Combined with PRF and ABG alone.	Horizontal probing depth of bony defect, vertical depth of bone crest, vertical depth of the base of bony defect and length of the intra bony defect.	ABG, with or without PRF, were successful in treating grade II furcation involvement, no differences between the study groups were observed.
5	Ashish Mathur 2015 [16]	Saraswati Dental College, Uttar Pradesh, India	38 intrabony defects.	Open flap debridement (OFD) with PRF or OFD with ABG	Defect-fill and Defect resolution atbaselineand6 months were calculated radiographically (intraoral periapical radiographs & orthopantomogram)	The use of either PRF or ABG were effective in the treatment of three wall IBDs with an uneventful healing of the sites.

CONCLUSION

The percentage of bone fill was greater in Group I (Auto graft + PRF) compared to Group II (HA+PRF) concluding that the autogenous bone grafts with PRF have the better regenerative capacity compaired to hydroxyapatite bone graft with PRF. However, further long-term studies should include extended follow up period and histological evaluation to determine more accurate regeneration.

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FIGURES

Fig -1: Acrylic stent with orthodontic wire.

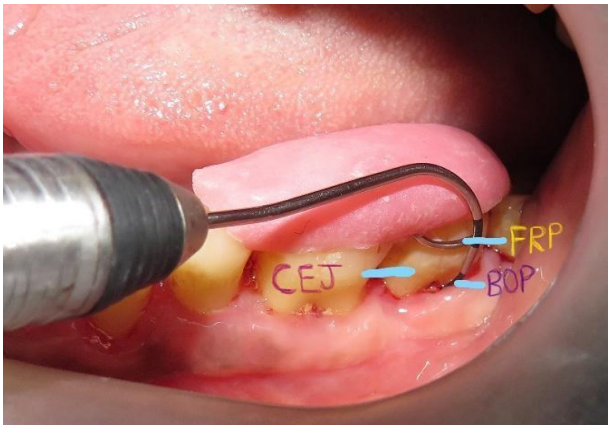


Fig-2: Clinical Attachment Level Calculation

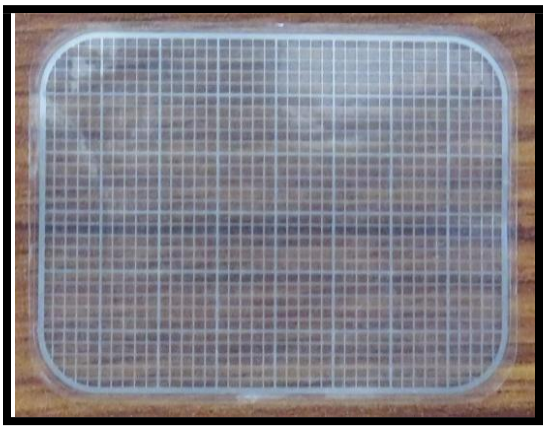


Fig-3:1x1mm GRID

Fig-4: Blood with drawl for PRF

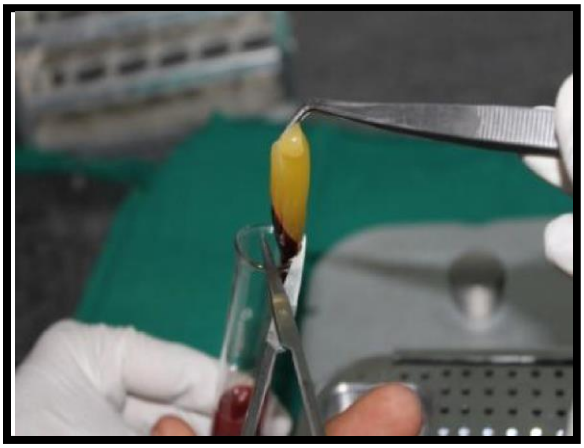


Fig-5: Separating buffy coat from PRF

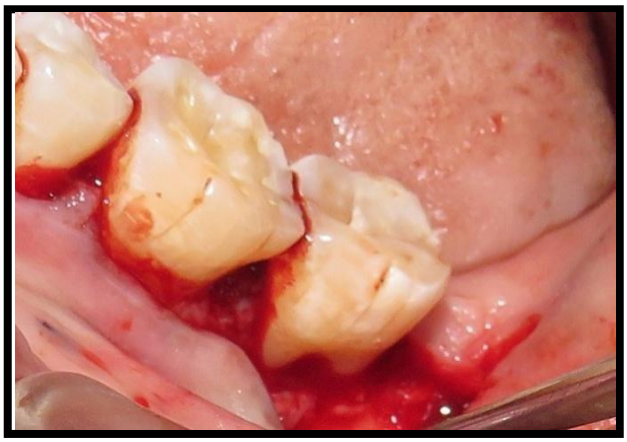


Fig-6: Flap elevation in Group I Patient

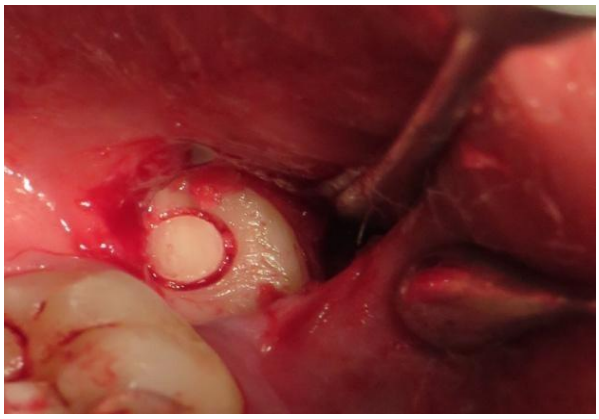
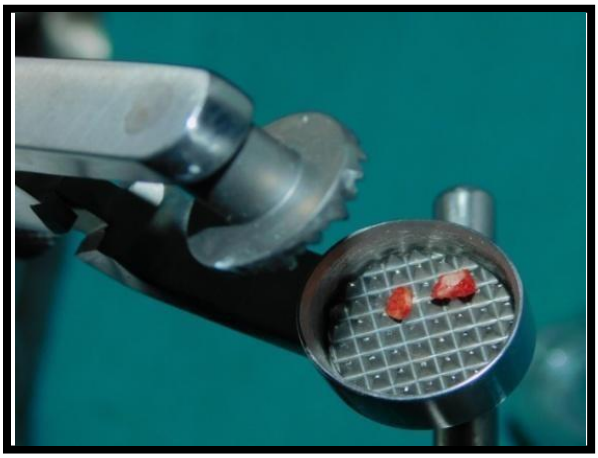


Fig-7: Retromolar region Donar site

Fig-8: Bone Graft Harvested



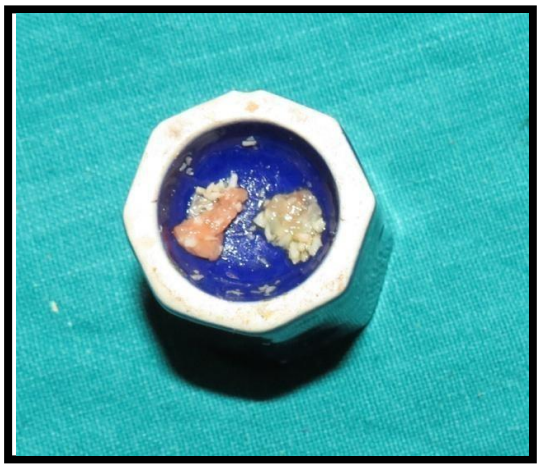


Fig-9: Bone milling

Fig-10: Autogenous bone graft mixed with PRF

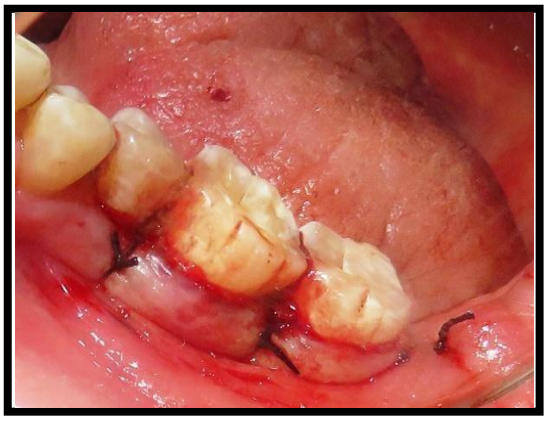


Fig-11: Placement of sticky bone in Furcation defect

Fig-12: Flap apposed with silk suture

Fig-13: Flap elevation in Group II patient

Fig-14: PRF Mixed with HA bone graft.

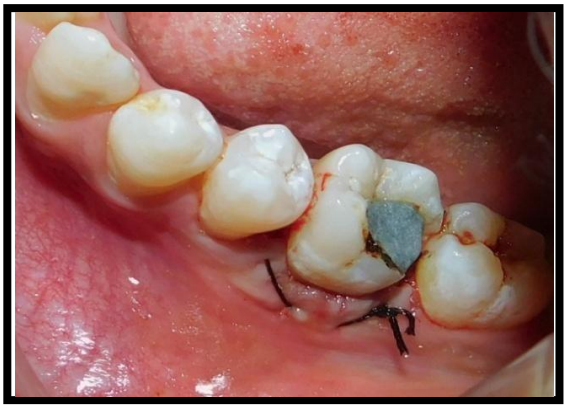
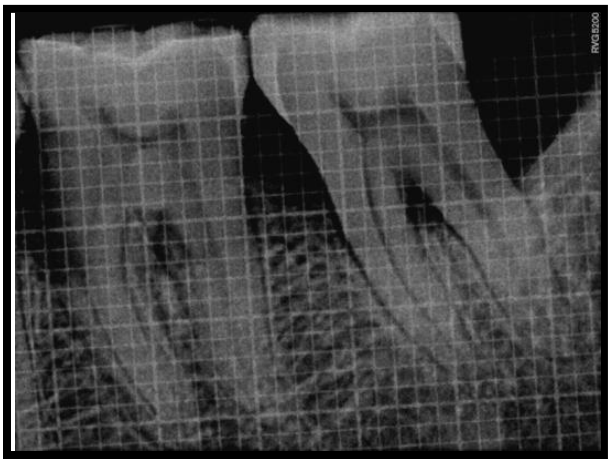


Fig-15: Placement of HA+PRF graft in defect.

Fig-16: Flap apposed with silk suture.



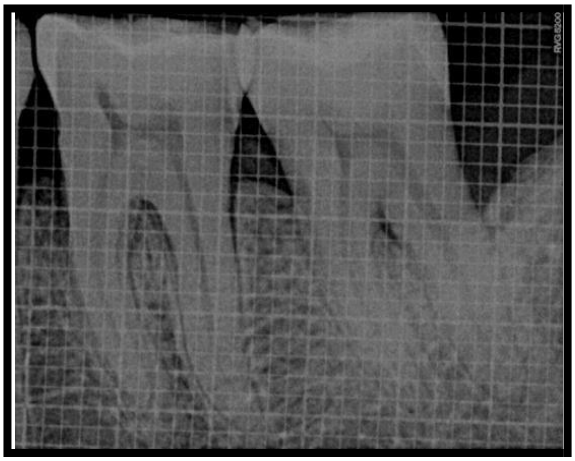


Fig-17:Pre-op RVG with1x1mm grid in Group I

Fig-18:Post-op RVG1x1mm grid in Group I

Fig-19: Pre-op RVG with1x1mm grid inGroup II Fig-20: Postop RVG in Group II

TABLE1: DEMOGRAPHIC DATA

Parameters	Group I	Group II
Gender M:F	12:3	8:7
Noofsitesat baseline	15	15
Noofsites evaluatedafter6 months	15	15

Table 1 demonstrates that the average age of the patients was 46.5 yrs in Group I and 48.5 yrs in Group II, 15 sites were treated and evaluated at baseline and after 6 months in each group. Out of total 30 sites 20 sites were treated in males and 7 sites were treated in females.

TABLE 2: INTER GROUP COMPARISON OF VERTICAL AND HORIZONTAL MEASUREMENT(V1,H1) OF FURCATION DEFECT AREA CLINICAL ATTACHMENT LEVEL, BEFORE AND 6 MONTHS AFTER TREATMENT IN GROUP I :

Variable	Group I		Group I		T-test value	P- value
	Mean	SD	Mean	SD		
Vertical measurementof furcation defect(V1)	8.0	±0.88	3.7	0.703	1.191	<0.001
Horizontal measurementof furcationdefect (H1)	6.1	±0.99	3.6	0.828	1.23	<0.001

Clinical Attachment level	7.8	±1.06	3.4	0.639	1.071	<0.001

Table 2 demonstrates the Inter group comparison in Group I, the mean vertical measurement of furcation defect, Horizontal measurement of furcation defect and Clinical attachment level were 8.0±0.88mm, 6.1±0.99mm, 7.8±1.06mm at baseline and 3.7±0.703mm, 3.6±0.828mm, and 3.4±0.639mm after 6 months of treatment.

TABLE 3: INTER GROUP COMPARISION OF VERTICAL AND HORIZONTAL MEASUREMENT(V2,H2) OF GRADE II FURCATION DEFECT AREA CLINICAL ATTACHMENT LEVEL AT BASELINE AND AFTER 6 MONTHS IN GROUP II :

Variable	GroupII		GroupII		T-testvalue	P- value
	Mean	SD	Mean	SD		
Vertical measurement of furcation defect(V2)	7.5	±0.74	3.4	0.516	1.032	<0.001
Horizontal measurement of furcation defect(H2)	6.2	±0.45	3.7	0.593	1.063	<0.001
Clinical attachment level	6.7	±0.79	3.8	0.639	1.081	<0.001

Table 3 demonstrates the Inter group comparison in Group II, The mean vertical measurement of furcation defect, Horizontal measurement of furcation defect and Clinical attachment level were 7.5±0.74mm, 6.2±0.45mm, 6.7±0.79mm at baseline and 3.4±0.51mm, 3.7±0.59mm, 3.8±0.63mm after 6 months of treatment.

TABLE 4: COMPARISON OF MEAN AND STANDARD DEVIATION (SD) OF CLINICAL PARAMETERS BEFORE AND 6 MONTHS AFTER TREATMENT GROUP WISE:

GINGIVAL INDEX	At Baseline (Mean+/-SD)	After6months (Mean+/-SD)	T value	P value
Group I	2.3±0.20	1.1±0.13	18.89	<0.0001
Group II	2.2±0.55	1.0±0.37	6.931	<0.0001
PLAQUE INDEX	At Baseline (Mean+/-SD)	After6months (Mean+/-SD)	T value	P value
Group I	2.0±0.02	1.1±0.32	10.68	<0.0001
Group II	1.8±0.36	1.1±0.37	5.223	<0.0001
PERIODONTAL DISEASE INDEX	At Baseline (Mean+/-SD)	After6months (Mean+/-SD)	T value	P value
Group I	4±0	2.6±0.50	10.69	<0.0001
Group II	4±0	2.4±0.51	11.5	<0.0001
VERTICAL PROBING DEPTH	At Baseline (Mean+/-SD)	After 6 months (Mean+/-SD)	T value	P value
Group I	7.8±1.06	3.4±0.63	13.76	<0.0001
Group II	7.9±0.70	3.5±0.51	33.60	<0.0001

GRAPH 1: COMPARISON OF MEAN AND SD OF CLINICAL PARAMETERS BEFORE AND AFTER TREATMENT BY GROUP WISE :

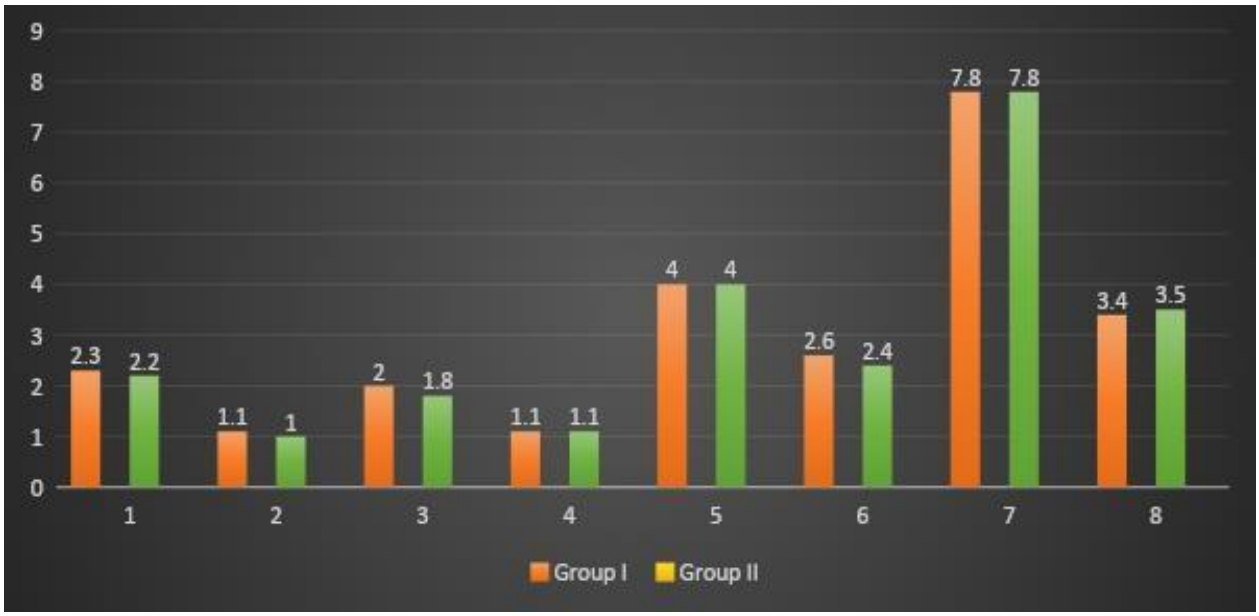


Table 4 and Graph 1 show the comparison of clinical parameters between Group I and Group II at baseline and at 6 months post-operatively. With significant P value the mean of all the clinical parameters in both the groups was almost similar before the intervention and at the end of 6 months and both the regenerative materials were effective.

TABLE 5: COMPARISION OF CLINICAL ATTACHMENT LEVEL, VERTICAL AND HORIZONTAL MEASUREMENT OF GRADE II FURCATION DEFECT AREA BEFORE AND AFTER 6 MONTHS INTERVENTION:

VERTICAL MEASUREMENT OF FURCATION DEFECT	At Baseline (Mean+/- SD)	After 6 months (Mean+/- SD)	T value	P value
Group I	8.0±0.88	3.7±0.70	34.39	<0.0001
Group II	7.5±0.74	3.4±0.51	17.40	<0.0001
HORIZONTAL MEASUREMENT OF FURCATION DEFECT	At Baseline (Mean+/- SD)	After 6 months	T value	P value

		(Mean+/- SD)		
Group I	6.1±0.99	3.6±0.82	10.71	<0.0001
Group II	6.2±0.45	3.7±0.59	13.08	<0.0001
CLINICAL ATTACHMENT LEVEL	At Baseline (Mean+/- SD)	After 6 months (Mean+/- SD)	T value	P value
Group I	7.8±1.06	3.4±0.63	20.57	<0.0001
Group II	6.7±0.79	3.8±0.77	16.14	<0.0001

GRAPH 2: COMPARISION BETWEEN TWO GROUPS OF GRADE II FURCATION DEFECT AREA MEASUREMENTS BEFORE & AFTER 6 MONTHS INTERVENTION:

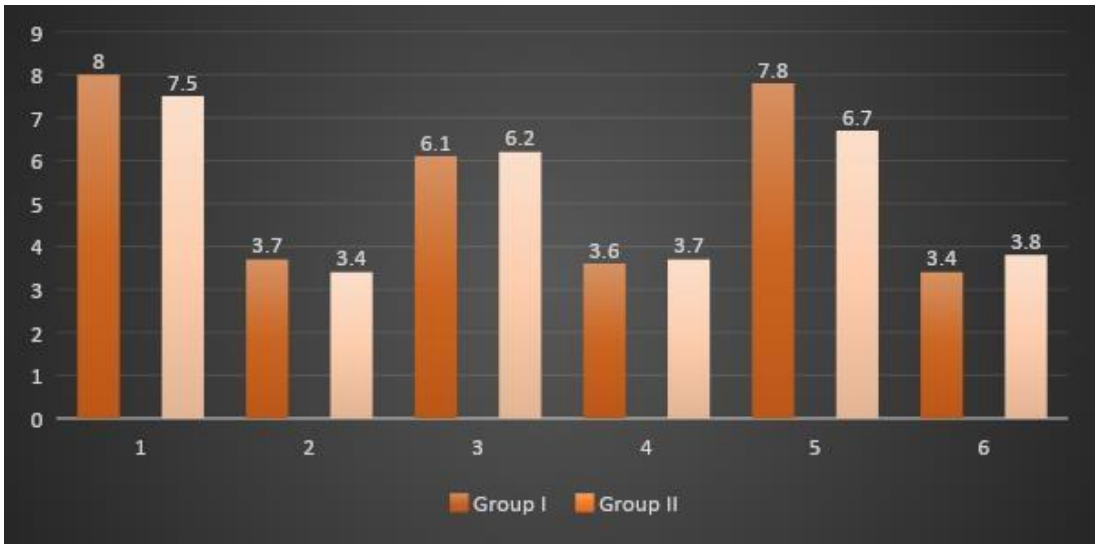


Table 5 and Graph 2 shows comparison between two groups of grade II furcation defect area measurements before and after 6 months. Comparing the mean values for clinical attachment

level and horizontal and vertical measurement of furcation defect between groups was found to be significant at the end of 6 months post-operatively.

TABLE 6:COMPARISON OF RADIOGRAPHIC (RVG) GRADE II FURCATION DEFECT AREA BEFORE AND AFTER INTERVENTION IN THE GROUP I AND GROUP II:

Radiographic (RVG) defect area of furcation	At Baseline (Mean±SD)	After 6 months (Mean±SD)	T value	P-value
Group I	7.6±0.8	2.6±0.8	24.56	<0.001
Group II	9.4±5.3	5.6±3.9	6.861	<0.001

GRAPH 3: COMPARISON OF RADIOGRAPHIC (RVG) GRADE II FURCATION DEFECT AREA BEFORE AND AFTER INTERVENTION IN THE GROUP I AND GROUP II

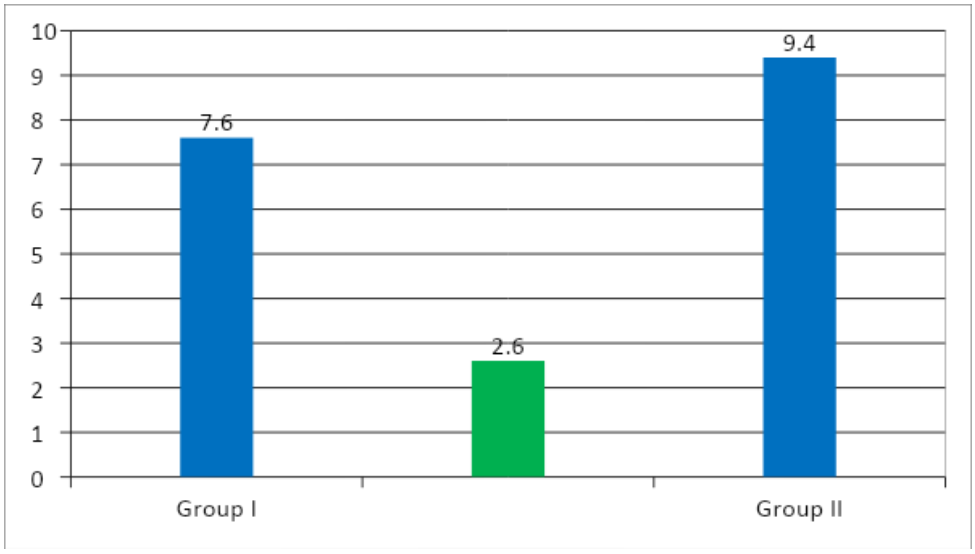


Table 6 and Graph 3 show the comparison of radiographic parameters (RVG) before and after intervention in the Group I and Group II. There was statistically significant difference in radiographic parameters in Group I compared to Group II. The mean radiographic unfilled defect at end of six months for Group I is2.6 and for Group II is 5.6

TABLE 7: PERCENTAGE OF RADIOGRAPHIC BONE FILL (RVG) AFTER INTERVENTION IN THE GROUP I AND GROUP II:

Variable	Group I	Group II
	AFTER 6 MONTHS	AFTER 6 MONTHS
Radiographic bone fill percentage of furcation defect	67.4%	36.8%

GRAPH 4: PERCENTAGE OF RADIOGRAPHIC (RVG) BONE FILL AFTER INTERVENTION IN THE GROUP I AND GROUP II:

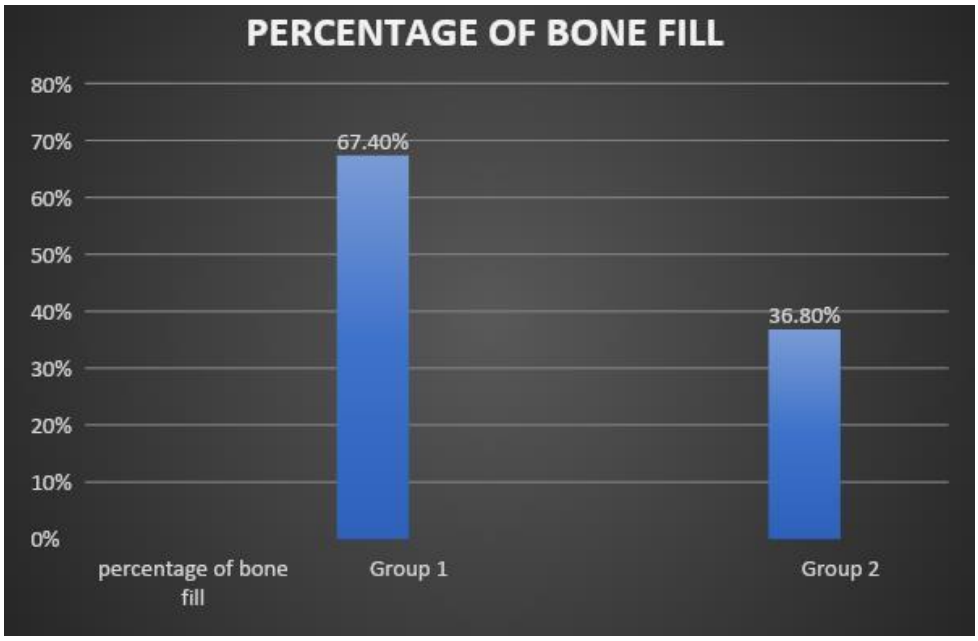


Table 7 and Graph 4 shows the percentage of bone fill at the end of 6 months, it ranged from 67.4% for Group I and 36.8 % for Group II indicating that Group I has the predictable bone fill. Hence the autogenous bone grafts with PRF have the better regenerative potential when compared with hydroxyapatite bone graft with PRF in class II furcation defects.

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