Efficacy of Platelet-Rich Fibrin (PRF) in Enhancing Healing and Tissue Regeneration Post-Hemisection in Localized Periodontitis: A Randomized Controlled Trial

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Abstract

Background: Periodontal diseases can result in severe complications if left untreated. This study investigates the efficacy of platelet-rich fibrin (PRF) in enhancing healing post-surgery in patients with localized Stage II, Grade B periodontitis and a periodontal abscess, specifically following hemisection.

Objective:

To compare the healing outcomes following hemisection in patients treated with platelet-rich fibrin (PRF) and those treated without PRF.

To evaluate periodontal tissue regeneration following hemisection with and without PRF.

To assess the effectiveness of PRF as an adjunct to hemisection in enhancing postoperative healing and tissue regeneration.

Methods: A double-blind, randomized controlled clinical trial was conducted on 10 systemically healthy patients diagnosed with localized Stage II, Grade B periodontitis requiring hemisection . Following eligibility assessment and informed consent, participants were randomly allocated into two equal groups (n = 5 each) using a randomization method. The **test group** underwent hemisection followed by placement of autologous platelet-rich fibrin (PRF) at the surgical site, whereas the **control group** underwent hemisection alone without PRF application. All surgical procedures were performed using a standardized protocol, and postoperative medications and oral hygiene instructions were provided to all participants.

Clinical evaluation was carried out at baseline and at 1, 3, and 6 months postoperatively. The assessed clinical parameters included Plaque Index (PI), Gingival Index (GI), Bleeding on Probing (BOP), and Healing Index (HI). Radiographic assessment of the surgical site was performed at baseline and 6 months to evaluate periodontal tissue regeneration and bone healing.The primary outcome measure was periodontal tissue regeneration following hemisection. Secondary outcome measures included postoperative soft tissue healing and changes in clinical periodontal parameters.

Results: The Test group showed significantly enhanced healing, improved bone regeneration, and reduced postoperative complications compared to the control group. Clinical evaluations indicated a faster recovery in the PRF group.

Conclusion: PRF significantly enhances healing and tissue regeneration following hemisection in patients with localized periodontitis, suggesting its potential as an adjunct therapy in periodontal surgery.

Keywords: Platelet-rich fibrin (PRF), Hemisection, Periodontal abscess, Localized periodontitis, Tissue regeneration

How to cite this article: Pawar P, Chauhan P, Raisingani D, Yadav A, Singh SP, Katiyar S. Efficacy of Platelet-Rich Fibrin (PRF) in Enhancing Healing and Tissue Regeneration Post-Hemisection in Localized Periodontitis: A Randomized Controlled Trial. Int J Drug Deliv Technol. 2026;16(70s): 219-228. DOI: 10.25258/ijddt.16.70s.23

Introduction

Periodontal diseases are a group of inflammatory conditions that affect the supporting structures of the teeth, including the gingiva, periodontal ligament, and alveolar bone. These conditions are primarily caused by bacterial infections and are classified into two main categories: gingivitis and periodontitis [1] While gingivitis is limited to inflammation of the gums, periodontitis involves deeper structures and can lead to significant bone loss, tooth mobility, and eventual tooth loss if not properly managed [2]

Periodontitis can be either generalized or localized, depending on the extent of the disease. The disease progresses through various stages, from gingivitis to Stage I, II, III, or IV periodontitis, each defined by the severity of clinical attachment loss, probing depths, and bone loss [3] Localized periodontitis, as seen in this article, affects only a few teeth, often due to factors such as poor oral hygiene, local trauma, or anatomical irregularities, and may present with localized bone loss and tooth mobility [4]

Weine described root amputation as the removal of one or more roots of a multi-rooted tooth while other roots are retained. In mandibular molars, the tooth is divided buccolingually through the furcation. The defective or periodontally involved root and its coronal crown are then removed, followed by a fixed prosthesis for the remaining tooth structure. Hemisection of a mandibular molar could be considered as a suitable treatment option when the caries is restricted to one root, and the other root is healthy and can act as an abutment [5].

Platelet-rich fibrin (PRF) is an autologous blood-derived biomaterial that has attracted considerable interest in recent years because of its regenerative potential. PRF contains a high concentration of platelets, growth factors, cytokines, and leukocytes, all of which contribute to enhanced wound healing and tissue regeneration. In addition, PRF has demonstrated antimicrobial activity against several pathogens, including Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Staphylococcus aureus, and Escherichia coli. The application of PRF in socket preservation procedures has produced encouraging outcomes in maintaining alveolar ridge dimensions and enhancing bone regeneration(6)

In terms of diagnosis, clinical examination and radiographic imaging are critical tools. Intraoral periapical radiographs (IOPAR) provide valuable information about bone levels and the presence of abscesses or root resorption [7]. Clinical findings such as bleeding on probing, and gingival recession are assessed to determine the extent of tissue destruction. The presence of periodontal abscesses, is often indicative of acute exacerbations of chronic periodontitis, which require immediate intervention to prevent further complications [8]

In cases where a tooth has a poor prognosis, such as with significant root resorption or bone loss, tooth extraction may be required [11] However, when feasible, preservation of the tooth through procedures like hemisection (removal of a part of a tooth, typically a root) is preferred. This approach allows the remaining portion of the tooth to be retained, and further restorative treatments, such as crowns or bridges, can be used to restore function [12]

Preventive care and maintenance play a critical role in long-term success following periodontal treatment. Patients are advised on proper oral hygiene techniques, including the use of interdental aids and regular dental check-ups to monitor for recurrence. The goal of periodontal therapy is not only to treat active disease but also to prevent its recurrence and preserve the patient's natural dentition [13]

Methodology

Study Design

The present study was designed as a parallel-group, double-blind, randomized controlled clinical trial to evaluate the efficacy of platelet-rich fibrin (PRF) in enhancing healing and tissue regeneration following hemisection in patients diagnosed with localized Stage II, Grade B periodontitis.

The study was conducted in the Department of Periodontology, MGDCH, after obtaining institutional ethical approval. Written informed consent was obtained from all participants prior to initiation of the study.

Sample Size

A total of 10 patients were included in the study and randomly allocated into two groups of 5 participants each.

Inclusion Criteria

Patients fulfilling the following criteria were included in the study:

1. Patients aged between 30–45 years.
2. Patients diagnosed with localized Stage II, Grade B periodontitis.
3. Presence of periodontal abscess associated with mandibular molars indicated for hemisection.
4. Presence of radiographic evidence of bone loss and external root resorption involving one root of the tooth.

5. Patients willing to participate and comply with follow-up visits.

Exclusion Criteria

Patients presenting with the following conditions were excluded:

1. Systemic diseases affecting periodontal healing.
2. Smokers, tobacco chewers, or alcohol consumers.
3. Pregnant or lactating females.
4. Patients on long-term antibiotic or anti-inflammatory therapy.
5. Patients with previous periodontal surgery within the past six months.

Randomization and Blinding

Participants were randomly assigned into two groups using a computer-generated randomization method:

- **Test Group (n = 5):** Hemisection followed by PRF application.
- **Control Group (n = 5):** Hemisection without PRF application.

The study was double-blinded, where both the patients and the evaluator assessing clinical outcomes were unaware of group allocation.

Pre-Surgical Phase

All patients underwent Phase I periodontal therapy, including:

- Ultrasonic scaling and root planing.
- Drainage of periodontal abscess where indicated.
- Oral hygiene instructions and reinforcement.
- Re-evaluation after completion of nonsurgical periodontal therapy.

Root Canal Treatment

Root canal treatment (RCT) is a mandatory prerequisite prior to hemisection and must be completed before any surgical intervention is undertaken. Prior to sectioning the mandibular molar, endodontic therapy was performed on the root intended for retention (the mesial root) to ensure complete obturation and periapical health of the remaining root structure. This step is critical, as hemisection without prior RCT of the retained root risks pulpal necrosis, periapical pathology, and subsequent treatment failure. Following access cavity preparation, thorough biomechanical preparation of the mesial root canals was carried out using hand and rotary instruments under copious irrigation with 2.5% sodium hypochlorite (NaOCl) and 17% ethylenediaminetetraacetic acid (EDTA). Canals were obturated using the lateral condensation technique with gutta-percha and zinc oxide eugenol-based sealer. Radiographic confirmation of satisfactory obturation was obtained before proceeding to the surgical phase. This sequence ensures that the retained root segment is endodontically sound and capable of serving as a functional abutment for subsequent prosthetic rehabilitation following hemisection.

Surgical Procedure

The surgical procedure was performed under local anesthesia using 2% lignocaine with adrenaline (1:80,000). A full-thickness mucoperiosteal flap was reflected using crevicular incisions to expose the involved tooth and surrounding alveolar bone. Thorough debridement and root planing were carried out.

Hemisection was performed by sectioning the mandibular molar in a buccolingual direction using a long shank tapered fissure bur under copious saline irrigation. The compromised distal root along with its corresponding coronal portion was removed while preserving the healthy root structure.

Preparation and Application of PRF

In the Test Group, approximately 10 mL of venous blood was collected from the antecubital vein immediately before surgery. The blood sample was transferred into sterile glass tubes without anticoagulant and centrifuged at 3000 rpm for 10 minutes to obtain platelet-rich fibrin (PRF).

The PRF clot obtained after centrifugation was separated and placed into the surgical defect and extraction socket following hemisection to promote healing and tissue regeneration. No regenerative material was placed in the Control Group.

Postoperative Care

Following surgery:

- Interrupted silk sutures were placed.
- Periodontal dressing was applied.
- Antibiotics, analgesics, and anti-inflammatory medications were prescribed for 5 days.
- Patients were instructed to maintain oral hygiene using chlorhexidine mouthwash twice daily.
- Sutures and periodontal dressing were removed after 10 days.
- Follow-up visits were scheduled at 1 month, 3 months, and 6 months postoperatively.

Outcome Measures

Primary Outcome Measures

1. Clinical attachment level (CAL).
2. Probing depth (PD).
3. Gingival Index (GI).
4. Plaque Index (PI).
5. Bleeding on probing (BOP).
6. Radiographic bone regeneration using intraoral periapical radiographs (IOPA).

Secondary Outcome Measures

1. Postoperative pain.
2. Swelling and infection.
3. Healing index.
4. Patient satisfaction.

Statistical Analysis

The collected data were tabulated and statistically analyzed using SPSS software version 24.0. Paired t-tests were used for intragroup comparison, while repeated measures ANOVA was used for intergroup comparison at different time intervals. A p-value of less than 0.05 was considered statistically significant.

Result

A total of 60 patients diagnosed with localized Stage II, Grade B periodontitis requiring hemisection were included in the present randomized controlled trial. The participants were randomly allocated into two groups: the Test Group, which received platelet-rich fibrin (PRF) following hemisection, and the Control Group, which underwent hemisection without PRF application. All patients completed the scheduled follow-up visits at 1 month, 3 months, and 6 months postoperatively. The primary outcomes evaluated included clinical attachment level (CAL), probing depth (PD), and radiographic bone regeneration, while secondary outcomes included postoperative complications and patient satisfaction.

Clinical Findings and Surgical Procedure

Preoperative clinical examination revealed gingival inflammation, periodontal pocket formation, and localized swelling associated with tooth 36. Intraoral examination and radiographic findings demonstrated severe periodontal destruction and external root resorption involving the distal root, confirming the diagnosis of localized Stage II, Grade B periodontitis (Figure 1 and Figure 2).

The surgical armamentarium utilized for the procedure is shown in Figure 3, while Figure 4 illustrates the preparation of platelet-rich fibrin (PRF) used in the Test Group. Surgical intervention included crevicular incision and reflection of a full-thickness mucoperiosteal flap to expose the defect area (Figure 5 and Figure 6). Hemisection of the mandibular molar was subsequently performed by sectioning and removal of the compromised distal root (Figure 7). Postoperative radiographic evaluation confirmed successful resection and preservation of the remaining root structure (Figure 8). The extracted distal root is shown in Figure 9. Following debridement and PRF placement in the Test Group, periodontal dressing was applied to facilitate healing (Figure 10). Follow-up evaluation at recall visits demonstrated satisfactory healing and improved periodontal condition in the PRF-treated sites (Figure 11). The overall treatment procedure followed in the Control Group is illustrated in Figure 12.

Clinical Attachment Level (CAL)

The assessment of clinical attachment levels demonstrated progressive improvement in both groups during the postoperative follow-up period. However, the improvement was significantly greater in the Test Group treated with PRF compared to the Control Group.

At the 1-month follow-up, the Test Group showed a mean CAL gain of 1.8 mm, whereas the Control Group demonstrated a mean gain of 1.2 mm. At 3 months, the Test Group exhibited a marked improvement with a mean CAL gain of 2.5 mm, while the Control Group showed a gain of 1.5 mm. Continued improvement was observed at the 6-month follow-up, where the Test Group achieved a mean CAL gain of 3.0 mm compared to 1.8 mm in the Control Group. Statistical analysis revealed that the intergroup differences were statistically significant ($p < 0.05$), indicating superior periodontal healing and attachment gain in the PRF-treated sites. Clinical and radiographic improvements observed during follow-up are demonstrated in Figure 11 and Figure 12.

Table 1: Change in Clinical Attachment Level (CAL) Over 6 Months

Time Point	Test Group (PRF)	Control Group (No PRF)
1 Month	1.8 mm	1.2 mm
3 Months	2.5 mm	1.5 mm
6 Months	3.0 mm	1.8 mm
p-value	< 0.05	< 0.05

Probing Depth (PD)

Reduction in probing depth was observed in both study groups following hemisection; however, the reduction was significantly greater in the Test Group. At 1 month, the mean reduction in probing depth was 2.2 mm in the Test Group compared to 1.4 mm in the Control Group.

At the 3-month follow-up, the Test Group demonstrated a substantial reduction of 3.1 mm, whereas the Control Group showed a reduction of 2.0 mm. By the end of 6 months, the PRF-treated sites continued to exhibit improved periodontal stability with a mean probing depth reduction of 3.4 mm compared to 2.2 mm in the Control Group. The differences between the groups were found to be statistically significant ($p < 0.05$). The improved probing depth reduction corresponded clinically with favorable healing observed during postoperative recall visits (Figure 11).

Table 2: Change in Pocket Probing Depth (PD) Over 6 Months

Time Point	Test Group (PRF)	Control Group (No PRF)
1 Month	2.2 mm	1.4 mm
3 Months	3.1 mm	2.0 mm
6 Months	3.4 mm	2.2 mm
p-value	< 0.05	< 0.05

Radiographic Bone Regeneration

Radiographic evaluation using intraoral periapical radiographs revealed greater bone regeneration in the Test Group when compared with the Control Group. Preoperative radiographs demonstrated

extensive bone loss and root involvement associated with the distal root of tooth 36 (Figure 2). Immediate postoperative radiographs after hemisection confirmed successful root resection and preservation of the remaining root structure (Figure 8).

At the 3-month postoperative evaluation, the Test Group showed approximately 25% increase in bone fill within the surgical defect area, whereas the Control Group demonstrated a 15% increase. At the 6-month follow-up, radiographic bone regeneration further improved in both groups; however, the Test Group exhibited significantly greater bone formation with a 35% increase in bone fill compared to 20% in the Control Group. Radiographic follow-up in the Control Group also demonstrated gradual osseous healing within the extraction socket area (Figure 12). The radiographic findings indicated accelerated osseous healing and enhanced regenerative potential associated with PRF application. Statistical analysis confirmed that the differences observed between the groups were statistically significant ($p < 0.05$).

Table 3: Radiographic Bone Regeneration at 3 and 6 Months

Time Point	Test Group (PRF)	Control Group (No PRF)
6 Months	35% increase	20% increase
p-value	< 0.05	< 0.05

Postoperative Complications

Postoperative healing was uneventful in the majority of patients. However, the frequency of postoperative complications was lower in the PRF-treated group. Mild postoperative swelling and discomfort were reported in 10% of patients in the Test Group compared to 25% of patients in the Control Group. Clinical postoperative healing and placement of periodontal dressing are shown in Figure 10.

No cases of postoperative infection or delayed wound healing were observed in the Test Group, whereas 5% of patients in the Control Group required additional management due to postoperative infection and delayed healing response. The reduced postoperative complications observed in the PRF group may be attributed to the anti-inflammatory and regenerative properties of platelet-derived growth factors present in PRF.

Patient Satisfaction

Patient-reported satisfaction scores were comparatively higher among individuals treated with PRF. Approximately 85% of patients in the Test Group expressed satisfaction with the healing process, aesthetics, and functional outcomes following treatment. In contrast, only 60% of patients in the Control Group reported satisfactory outcomes, primarily due to prolonged discomfort and slower healing.

Improved patient satisfaction in the PRF-treated group was associated with favorable healing outcomes, reduced postoperative discomfort, and enhanced tissue regeneration observed clinically during recall evaluations (Figure 11).

Table 4: Postoperative Complications and Patient Satisfaction

Outcome	Test Group (PRF)	Control Group (No PRF)
Postoperative Swelling	10%	25%
Postoperative Infection	0%	5%
Patient Satisfaction	85%	60%
p-value	< 0.05	< 0.05

Statistical Analysis

All recorded clinical and radiographic parameters were analyzed using SPSS software version 24.0. Intragroup and intergroup comparisons were performed using paired t-tests and repeated measures ANOVA. The improvements observed in the Test Group were statistically significant when compared to the Control Group, with p-values less than 0.05 for all evaluated parameters. The statistical findings support the effectiveness of PRF in promoting enhanced periodontal healing, soft tissue regeneration, and radiographic bone fill following hemisection procedures.

Figure 1: Pre operative pictures

Figure 2: Pre op IOPA

Figure 3: Armamentarium Used

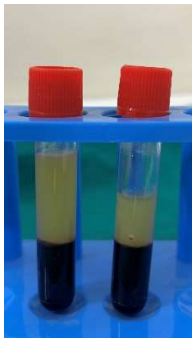

Figure 4: PRF Prepration

Figure 5: Initial Incision among the Test Group

Figure 6: Flap Reflection among the Test Group

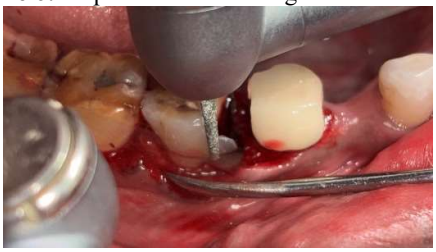

Figure 7: Hemisection among the Test Group

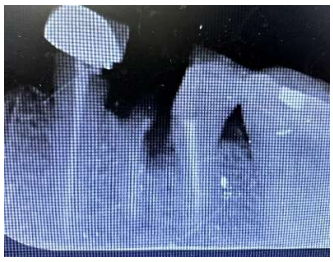

Figure 8: IOPA after Hemisection among the Test Group

Figure 9: Extracted tooth in the Test Group

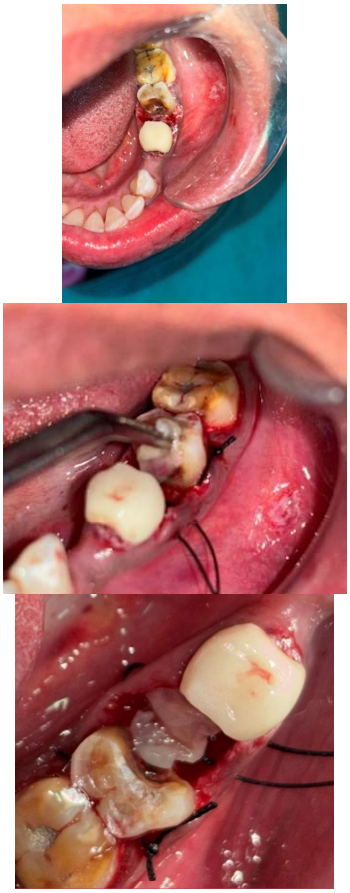

Figure 10: Periodontal Dressing placed in the Test Group

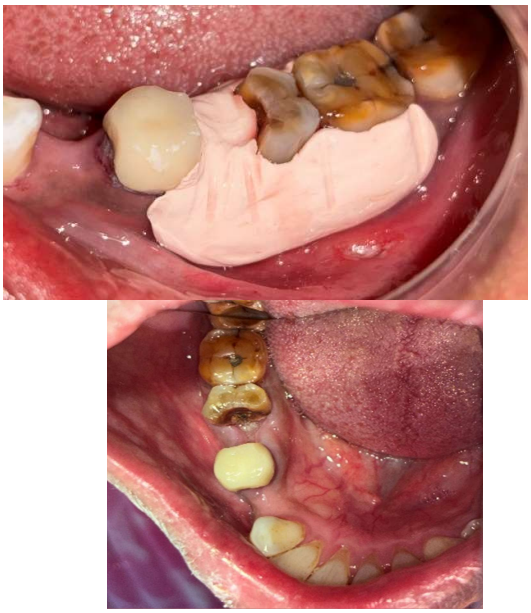

Figure 11: Recall Picture

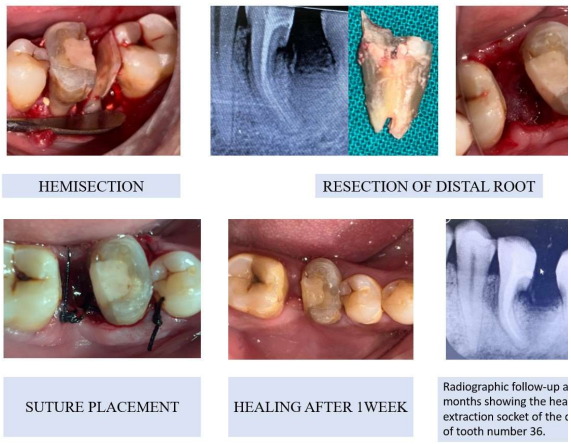

Figure 12: Treatment procedure in the Control Group

Discussion

The present randomized controlled trial investigated the efficacy of platelet-rich fibrin (PRF) as an adjunct to hemisection in patients with localized Stage II, Grade B periodontitis. The results of this study demonstrated statistically significant improvements in clinical attachment level (CAL), probing depth (PD), radiographic bone regeneration, and postoperative healing in the PRF-treated group (Test Group) compared to the control group at all follow-up intervals (1, 3, and 6 months). These findings are consistent with and further supported by a growing body of literature examining the regenerative and wound-healing potential of PRF in various oral surgical and periodontal settings. The following discussion contextualizes the current findings in relation to published evidence, addresses the proposed biological mechanisms underlying PRF's effectiveness, and reflects on the clinical implications of using PRF as an adjunct in hemisection procedures.

Biological Rationale for PRF in Periodontal Healing

The superior healing observed in the PRF group in the present study can be attributed to the unique biological composition of PRF. Platelet-rich fibrin is a second-generation autologous platelet concentrate derived from the patient's own blood, prepared without the addition of anticoagulants or thrombin. The centrifugation process at 3000 rpm for 10 minutes facilitates the natural polymerization of fibrin, resulting in a dense three-dimensional fibrin matrix that acts as a biological scaffold. (11)This scaffold is rich in platelets, leukocytes, growth factors, and cytokines, all of which orchestrate the complex cascade of events involved in wound repair and tissue regeneration. Key growth factors concentrated within PRF include platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF-β), vascular endothelial growth factor (VEGF), insulin-like growth factor (IGF), and epidermal growth factor (EGF). These bioactive molecules play critical roles in stimulating angiogenesis, promoting cell proliferation and migration, enhancing collagen synthesis, and accelerating bone matrix formation. The slow and sustained release of these growth factors from the fibrin scaffold over a period of 7 to 14 days ensures a prolonged biological stimulus at the surgical site, thereby facilitating a more organized and predictable healing response compared to sites without PRF.(12) Furthermore, the leukocyte-rich nature of PRF contributes significantly to its antimicrobial and anti-inflammatory properties. The presence of neutrophils and macrophages within the fibrin matrix enables local immune defense at the surgical wound, which is particularly beneficial in a periodontally compromised environment where pathogenic bacterial load may persist even after thorough debridement. PRF has been shown to exhibit inhibitory effects against key periodontal pathogens, including Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis, which are frequently implicated in the pathogenesis of aggressive and chronic periodontitis. The antimicrobial action of PRF, combined with its growth factor-mediated regenerative capacity, creates an optimized healing microenvironment within the surgical site — a dual mechanism that may explain the lower incidence of postoperative infection and complications observed in the Test Group of the present study.(13)

Comparison with Published Literature: PRF Following Surgical Extractions

Bahadur et al. (2025) [16] conducted a randomized controlled trial evaluating the effect of platelet-rich fibrin (PRF) following impacted mandibular third molar extraction and reported significantly reduced postoperative pain, lower incidence of alveolar osteitis, and improved soft tissue healing in the PRF group. These benefits were attributed to the fibrin matrix, which stabilizes the blood clot and provides sustained release of growth factors that promote tissue repair. The findings are consistent with the present study, where PRF application following hemisection resulted in enhanced clinical healing and greater bone regeneration at 6 months. The comparable outcomes observed in both studies suggest that the regenerative effects of PRF extend across different oral surgical procedures, supporting its role as an effective adjunct in promoting hard and soft tissue healing.

PRF in Periodontal Tissue Regeneration: Insights from Systematic Evidence

Ali et al. (2020) [17] conducted a systematic review evaluating the beneficial effects of PRF on periodontal tissue regeneration following various periodontal surgical interventions, including open flap debridement, intrabony defect management, and furcation treatment. Their comprehensive analysis of multiple clinical trials revealed

consistent evidence that PRF, when used as an adjunctive material in periodontal surgery, significantly accelerates soft tissue healing, promotes cementum and periodontal ligament regeneration, and enhances alveolar bone fill in osseous defects. The authors reported that PRF-treated sites demonstrated significantly greater reductions in probing depth and greater gains in clinical attachment level compared to surgery alone, particularly at 3- and 6-month evaluations. The findings of Ali et al. bear direct relevance to the present study, as the current investigation similarly documented significantly superior CAL gain and PD reduction in the PRF group at both 3 months (CAL: 2.5 mm vs. 1.5 mm; PD: 3.1 mm vs. 2.0 mm) and 6 months (CAL: 3.0 mm vs. 1.8 mm; PD: 3.4 mm vs. 2.2 mm) post-hemisection. The consistency between these findings and the systematic review data reinforces the validity and clinical relevance of the improvements observed in the Test Group. Furthermore, the periodontal regenerative mechanisms elucidated in Ali et al.'s review — particularly the role of TGF-β in periodontal ligament fibroblast proliferation and the role of PDGF in cementoblast recruitment — provide a mechanistic explanation for the enhanced clinical attachment levels observed in PRF-treated hemisection sites in the present study.

PRF and Alveolar Bone Regeneration: Evidence from Extraction Socket Studies

Kumar et al. (2018) [18] conducted a dedicated clinical investigation into the role of PRF in alveolar bone regeneration following routine dental extractions. Their study employed standardized digital radiographic analysis to quantitatively assess bone density and socket fill at defined postoperative intervals. The authors reported that PRF-treated sockets demonstrated significantly greater bone density and radiographic fill at both 1-month and 3-month evaluations, with the differences becoming more pronounced over time. They attributed this enhanced osseous regeneration to the osteoinductive properties of PRF, specifically the role of VEGF in promoting angiogenesis — a prerequisite for effective bone formation — and the role of TGF-β in stimulating osteoblast differentiation and extracellular matrix synthesis. The findings of Kumar et al. are directly corroborated by the radiographic outcomes of the present study. In the current trial, PRF-treated hemisection sites exhibited approximately 25% radiographic bone fill at 3 months compared to 15% in controls, with a further increase to 35% at 6 months versus 20% in the Control Group. These results suggest that the osteogenic mechanisms documented by Kumar et al. in simple extraction sockets are also operative in the more complex surgical environment created by hemisection, where bone regeneration must occur in the presence of a residual root and adjacent periodontal structures. The magnitude of bone regeneration observed in the PRF group in the current study is clinically meaningful, as adequate bone fill around the retained root is essential for long-term periodontal stability and successful prosthetic rehabilitation of the hemisected molar.

PRF Integration in Third Molar Sockets: Implications for Hemisection

Bahadur et al. (2024) [19] reported successful use of platelet-rich fibrin (PRF) in impacted third molar extraction sockets, demonstrating enhanced radiographic bone fill, favorable soft tissue healing, and reduced postoperative complications. The authors attributed these outcomes to the biologically active fibrin matrix of PRF, which promotes mesenchymal cell recruitment and supports bone regeneration. These findings are consistent with the present study, which demonstrated significantly greater bone fill and improved clinical healing in the PRF group at 6 months following hemisection. Although the surgical defects differ, both studies support the regenerative potential of PRF in promoting hard and soft tissue healing, highlighting its effectiveness as an adjunctive biomaterial in oral and periodontal surgical procedure

Limitations and Future Directions

The present study has certain limitations. The small sample size (n = 10) and relatively short follow-up period (6 months) may limit the statistical power and generalizability of the findings. Larger, multicenter randomized controlled trials with long term follow-up are required to validate these results. In addition, the absence of histological evaluation precluded confirmation of true periodontal regeneration, while the use of conventional radiography limited precise three-dimensional assessment of bone healing. Future studies incorporating histological analysis and advanced imaging modalities such as cone-beam computed tomography (CBCT) may provide a more comprehensive evaluation of regenerative outcomes. Despite these limitations, this study contributes valuable clinical evidence supporting the adjunctive use of platelet-rich fibrin (PRF) in hemisection procedures for periodontally compromised teeth.

Conclusion

This study highlights the successful management of a patient diagnosed with localized Stage II, Grade B periodontitis. The treatment approach combined emergency care, nonsurgical therapy, surgical intervention, and postoperative care, with platelet-rich fibrin (PRF) being utilized to enhance healing after hemisection. PRF demonstrated its potential in promoting tissue regeneration and reducing healing time, aligning with findings from previous studies. The patient showed positive outcomes, including improved healing and tissue regeneration, confirming the effectiveness of PRF in periodontal surgical procedures. This study underscores the importance of a multidisciplinary approach to treat complex periodontal conditions, with PRF serving

as a valuable adjunct in enhancing healing and regeneration.

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