Advances in Medical, Pharmaceutical and Dental Research Journal (AMPDR)- ISSN 2812-4898
http://dx.doi.org/10.21622/AMPDR.2024.04.2.1031

Dec. 2024
Volume 4
Issue 2

Effect of Platelet Rich Fibrin on Post-Operative Sequelae Following Mandibular Third Molar Surgery A Prospective Comparative Study

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Received on, 26 September 2024 - Accepted on, 31 October 2024 - Published on, 20 November 2024

ABSTRACT:

Objectives: *The purpose of this study is to estimate the effect of Platelet Rich Fibrin (PRF) on the control of post-operative sequalae i.e. Pain, Trismus, Swelling and Incidence of Alveolar Osteitis (AO) following mandibular third molar surgery.*

Material and Methods: *26 patients are divided into two groups. Group I gets PRF after extraction of the third molar while Group II does not get any PRF. Post-surgical Pain, Swelling, Trismus, Incidence of AO are evaluated.*

Results: *It is found that Group II has greater pain scores than Group I assessed by VAS, with statistically significant greater score after 2 hours (P=0.0014) and 12 hours (P=0.0063). In case of swelling, Site II shows statistically significant difference on the 7th day (P=0.007) and the 14th day (P=0.04), Site III shows statistically significant difference on the 3rd day (P=0.005) and the 7th day (P=0.03), and Site IV shows statistically significant difference only on the 3rd day (P=0.004). Inter-incisal distance is higher for Group I than Group II, statistically significant on the 7th day (P=0.0069) and the 14th day (P=0.0008). This study does not find any incidence of AO in both groups.*

Conclusions: *PRF appears to be beneficial and effective in lowering postoperative sequalae in mandibular third molar surgery. PRF effectively decreases Pain, Swelling and Trismus when compared with case and control group. However, this study cannot comment on effectiveness of PRF on incidence of alveolar osteitis.*

Keywords: *Dry Socket, Pain, Platelet-Rich Fibrin, Swelling, Third Molar, Trismus.*

1. INTRODUCTION

Third molars, or wisdom teeth, are the last teeth to erupt in the oral cavity. [1] The mandibular third molars, whether they have erupted or are stuck, should be removed if they are causing symptoms, diseased, or anticipated to cause issues under dentures. [2] Dental surgeons frequently perform surgery to extract mandibular third molars. In a research study, it is found that almost 90% of patients waiting for surgery in oral and maxillofacial surgery hospitals are waiting for third molar surgery. [3] This surgery carries the risk of various postoperative complications like pain, trismus, swelling, and alveolar osteitis. [4] To reduce these complications, various strategies are used before and after surgery. [5] Platelet-rich fibrin (PRF), a recent advancement in blood-derived products, has become popular in healing wounds. [6] PRF is obtained by spinning autologous peripheral blood in a centrifuge, which triggers the coagulation process and activates platelets. PRF was pioneered in 2000 by Joseph Choukroun and colleagues. [8] It offers numerous clinical advantages by naturally creating a fibrin scaffold that aids in clot formation, acts as a framework for tissue regeneration, and maintains growth factors and stem cells. [9] Dentistry has extensively used PRF for several years, particularly in procedures like implant dentistry and alveolus surgery. Reports suggest that using PRF in the socket after extraction reduces postoperative complications and speeds up tissue healing following third molar surgery. [10] However, evidence is constrained, and results remain controversial. [11–13] Therefore, this study aims to assess the impact of autologous platelet-rich fibrin (PRF) on managing postoperative complications such as pain, trismus, swelling, and the occurrence of alveolar osteitis after mandibular third molar surgery.

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2. MATERIAL AND METHODS

This study is carried out in the Department of Oral and Maxillofacial Surgery at Guru Nanak Institute of Dental Science and Research, Kolkata. The study was conducted after approval from the Institutional Ethics Committee of Guru Nanak Institute of Dental Science and Research, between December 2021 to January 2024. All participants have read and signed informed consent form. Patients who need extraction of impacted mandibular third molar, are divided in two groups, by alternative selection method.

Case group / group I is defined where PRF is placed at the surgical site after surgical removal of impacted mandibular third molars. Control group/ Group II is defined as PRF is not placed at the surgical site after surgical removal of impacted mandibular third molars.

Inclusion Criteria:

a) The age of the patient is between 18-30 years.

b) Patients who understand and willing to follow all study procedures.

c) There is be no further predilection made for sex, caste, creed, or religion.

d) Concerned tooth is free of any pathological lesion, at the time of extraction.

e) Mandibular third molar with Pederson's Difficulty Index 3-6 are included.

f) All patients fall within only ASA category I & II are included.

Exclusion Criteria:

a) Patients with comorbid conditions contraindicating any impacted mandibular third molar surgery procedure.

b) Pregnant patients and lactating mothers.

c) Patients not willing to follow up or who will not give consent.

d) Patients taking any medication which can interfere with bone healing.

Appropriate lab investigations are carried out. Under all aseptic techniques, 10 ml of blood is drawn intravenously from the antecubital region from median cubital vein of patient's forearm. This is transferred to centrifugal vials for the preparation of PRF. The blood sample is taken without anticoagulant in tubes and is immediately centrifuged at 2700 rpm (approximately 400 g) for 12 min (figure-1). Standard operating procedure is done by the same surgeon (Figure 2). All patients receive the same postoperative instructions. All patients receive the same standard drug regimen postoperatively.

Post-surgical pain assessment:

Pain is evaluated with a visual analogue scale (VAS), 100 mm long, that ranged from 0 = "no pain" to 100 = "the worst possible pain") in the postoperative phase. The readings are asked to be marked by the patient on the given graph paper in the following time stamp: 1st hour, 2nd hour, 4th hour, 6th hour, 12th hour, 24 hours, 48 hours, and 72 hours postoperatively.

A provision of rescue analgesic taken is done. Patients are also asked to keep record on the assigned proforma of the first rescue analgesic consumed postoperatively, if required, and the total number of such analgesics consumed, if any, on each day from the day of the surgical procedure to the postoperative 3rd day.

Post-surgical swelling assessment:

Swelling measurements are taken using an easily adaptable scale and surgical marker. Facial oedema is evaluated as described by De Menezes et al. (2010).[14]

The swelling is evaluated as follows: it is marked with permanent marker prior to the surgery on the following facial region (Figure 3):

- From the angle of the mandible to tragus (Distance/Site I);
- From the angle of the mandible to the external corner of the eye (Distance/Site II);
- From the angle of the mandible to the nasal border (Distance/Site III);
- From the angle of the mandible to the labial commissure (Distance/Site IV); and
- From the angle of the mandible to the soft tissue pogonion (Distance/Site V).

All the lines are measured separately preoperatively, and on the 3rd, 7th and 14th postoperative days with the flexible scale and surgical marker, the measured values in "cm" are recorded. The preoperative value of each line is considered as baseline. The difference between each postoperative measurement on that day on the 3rd, 7th and 14th days postoperatively indicated as facial swelling.

Post-surgical trismus assessment:

Trismus is measured as the maximum mouth opening. Maximum mouth opening is taken as the distance measured between the upper and lower central incisors with vernier calipers, taken preoperatively and on the 3rd, 7th, 14th and 28th post operative days.

Alveolar Osteitis assessment:

It is diagnosed by clinical evaluation and history. By the presence of a continuous throbbing postoperative pain in and around the extraction socket that is not adequately relieved by analgesics. The pain is associated with partially or completely disintegrated blood clot or an empty socket with or without halitosis.

3. STATISTICAL ANALYSIS:

The collected data are tabulated in a spreadsheet using Microsoft Excel 2019 and then statistical analysis is carried out using IBM SPSS Statistics for Windows, Version 26.0. (Armonk, NY: IBM Corp). Graphs, Box plots, and Pie diagrams are constructed using the GraphPad Prism for Windows, Version 9.0 (GraphPad Software, La Jolla California USA). A Shapiro-Wilk's test and a Visual inspection of the histograms, normal Q-Q plots, and box plots show that the collected data are approximately normally distributed for both groups for all the variables. A chi-square test is carried out to test the categorical variables. Within-group comparisons are carried out with the repeated measures analysis of variance (ANOVA) the two-way ANOVA (for the VAS scores) and post-hoc Tukey's HSD test. Inter-group comparisons for the improvement in the outcome parameters are carried out with the independent samples t-test. The *P* value of <0.05 is considered as the level of significance.

4. RESULTS

Initially 34 patients give their consent for their study, but 6 patients do not come for followup, and 2 patients have dehiscence, so the researchers have to excluded them. So, 26 patients are included into study and are divided into two group. Group I which gets PRF into socket comprises 13 patients and Group II comprises 13 patients who do not get PRF. Table 1 demonstrates patients' demographic data which are found not significant.

Pain:

In the present study sample, 53.8% require extra dosage of analgesics. The corrected Chi-Square (χ^2) test of independence is carried out (Table 2) to compare the frequency distribution of the study subjects between the study groups according to requirement of rescue analgesics, and a highly significant association is found ($\chi^2(1) = 9.9$, $P=0.002$), implying that Group II subjects require a significantly dosage of additional rescue analgesics.

Comparisons are carried out using the independent sample t-test to assess the difference in the VAS scores (table 3) between the study groups and it is found that Group II has greater pain scores assessed by the VAS, with a significantly greater score after 2 hours ($P=0.0014$) and 12 hours ($P=0.0063$), respectively.

Swelling:

***Post-operative 3rd day*:** Comparisons for the increase in swelling measurements on the 3rd day (table 4) relative to the Baseline are carried out using the independent samples t-test:

- Site III: The increase in swelling measurements on the 3rd day relative to the Baseline is significantly higher for Group II than Group I ($P=0.005$).
- Site IV: The increase in swelling measurements on the 3rd day relative to the Baseline is significantly higher for Group II than Group I ($P=0.004$).

***Post-operative 7th day*:** Comparisons for the increase in swelling measurements on the 7th day relative to the Baseline are carried out using the independent samples t-test:

- Site II: The increase in swelling measurements on the 7th day relative to the Baseline is significantly higher for Group II than Group I ($P=0.007$).
- Site III: The increase in swelling measurements on the 7th day relative to the Baseline is significantly higher for Group II than Group I ($P=0.03$).

***Post-operative 14th day*:** Comparisons for the change in swelling measurements on the 14th day relative to the Baseline are carried out using the independent samples t-test:

- Site II: The increase in swelling measurements on the 14th day relative to the Baseline is significantly higher for Group II than Group I (decrease than the Baseline) ($P=0.04$).

Trismus:

Comparisons for the inter-incisal distance (mm) (Table 5) relative to the Baseline are carried out using the independent samples t-test and the following is observed:

Advances in Medical, Pharmaceutical and Dental Research Journal (AMPDR)- ISSN 2812-4898
http://dx.doi.org/10.21622/AMPDR.2024.04.2.1031

Post-operative 3rd Day: The decrease in inter-incisal distance (mm)relative to the Baseline is higher for Group II than Group I, however, the difference is not statistically significant (*P*=0.94).

Post-operative 7th Day: The decrease in inter-incisal distance (mm) relative to the Baseline is significantly higher for Group II than Group I (*P*=0.0069).

Post-operative 14th Day: The change in the inter-incisal distance (mm) relative to the Baseline is significantly higher for Group II (decrease from baseline) than Group I (increase from Baseline) (*P*=0.0008).

Post-operative 28th Day: The change in inter-incisal distance (mm)relative to the Baseline is higher for Group I (increase from baseline) than Group II decrease from baseline), however, the difference is not statistically significant (*P*=0.081).

Alveolar Osteitis:

Incidence of alveolar osteitis is not found among the participant in both case or control groups.

5. DISCUSSION:

This prospective study aims to evaluate the effect of PRF on postoperative sequalae after mandibular third molar surgery. This could help the oral and maxillofacial surgeon to provide a better postoperative outcome for patients. The results show a reduction in pain, swelling and trismus after surgery when PRF is used.

In the present study sample, Group I takes 3 rescue analgesics over 3 days' time, whereas Group II takes 11 rescue analgesics over 3 days and a highly significant association is found implying that Group II subjects require a significant dosage of additional rescue analgesics. Al-Hamed et al. [15] come to the conclusion that the group treated with PRF requires less rescue analgesic medication. A similar outcome is also discovered in the research conducted by Silva et al. [16]. In the terms of the VAS scores between study groups, it was found that Group II has greater pain scores assessed by the VAS, with a significantly greater score after 2 hours and 12 hours. In the researchers' opinion, this study is probably the first study to evaluate action of PRF on hourly basis. Acute pain scores are reported to be better in the PRF group compared to the non-PRF group according to the findings of Kumar et al. [10]. Miyamoto et al. [17] similarly conclude that PRF demonstrates short-term effectiveness in alleviating pain immediately post-surgery, producing statistically significant results. Additionally, a study led by Silva et al. [16] reveals that 70% of participants experience severe pain at the surgical site without PRF, whereas only 30% report severe pain at the PRF-treated site on the first postoperative day. By the second day, these numbers decrease to 30% and 10%, respectively, with statistical significance noted once again. However, there are some conflicting results that show no difference in pain and quality of life in-between both groups. [18,19]

PRF is shown to possess potent anti-inflammatory activity in macrophages. Macrophages are critically involved in inflammation and wound healing, a method that might include a polarisation shift from an M1 proinflammatory to an M2 pro-resolution phenotype. Macrophages M1 generations form during tissue causing strife, later M2 types control the scene to support tissue amend and restructuring with the sequence resolution of strife. Among the main marks of M1 macrophages are the strife cytokines IL1 and IL6. M2 macrophages expose marker genes such as arginase-122 and YM1, the late also known as chitinase-like 3. Reports on growth factors and immunologic factors of PRF uncover the presence of IL6, IL8, IL4, and TGF-β, all of which can change macrophage polarisation. For example, IL6 and IL8 provide a strife environment that favours the shape of M1 macrophages, whereas particularly IL4 and TGF-β skew macrophage polarisation toward an M2-like phenotype. [20] Moreover, in vitro experiments show similar results, PRF deletes inflammatory response caused by lipopolysaccharide to some extent. They determine that TLR4, an activator of inflammatory stimulation and p-p65, a key factor that belongs to classical inflammatory related NF-κB signal pathway, can be inhibited by use of PRF. [21]

Lipid fractions of PRF are tested for their potential to lower the inflammatory responses of ST2 bone marrow stromal cells and primary bone marrow macrophages exposed to IL1β and TNFα, and LPS, especially. Cytokine production and the underlying signaling pathway are analysed by RT-PCR, immunoassays, and Western blotting. They report that lipid from PRF substantially lowers cytokine-induced expression of IL6, CCL2 and CCL5 in ST2 cells. Moreover, the inflammatory responses induced by Pam3CSK4, the agonist of Toll-like receptor (TLR) TLR2, are partially reduced by the lipid extract in ST2 cells. The PRF lipid further reduces the LPS-induced expression of IL1β, IL6 and CCL5 in macrophage at the transmittal level. This is confirmed by showing the ability of PRF lipid to diminish IL6 at the protein level in ST2 cells and macrophage. These findings suggest that the PRF is responsible for the anti-inflammation activity (Figure 4) of PRF in in vitro. [22]

In this study, there is a statistically significant difference in the degree of swelling during the 3rd,

7th, and 14th days between the study group and the control group, but not all sites. Site II shows statistically significant difference in the post-op 7th day and 14th day, Site III shows statistically significant difference on the post-op 3rd day and 7th day, and Site IV shows statistically significant difference in only post-op on the 3rd day. Harsh et al. [23] reveal that statistically significant variations are noted in swelling on the 3rd and 7th days post-surgery, as well as one month later, between the PRF and control sides. A study by Kapse et al. [24] similarly indicates that swelling percentages are consistently lower on the PRF side. However, there is some conflicting results that show no difference in post operative in between both groups. [25,26] Swelling typically peaks 2-3 days following the surgery before gradually decreasing, attributing to the inflammatory process commonly observed after surgical extractions around the cheek and mouth, causing patient discomfort [27]. The cytokines TNF-α, IL-1 and IL-6 are pivotal in acute inflammation, elevating blood vessel permeability and subsequently increasing interstitial fluid osmotic pressure, resulting in edema formation. PRF exhibits elevated levels of anti-inflammatory cytokines such as IL-4 and interleukin receptor antagonist inhibitor (ILra), clarifying its efficacy in significantly reducing postoperative swelling in various settings. [28]

In this study, there is a statistically significant difference in the degree of postoperative trismus during the 7th day and the 14th day between both groups; however, it is not statistically significant on the 3rd and the 28th day and the change in the inter-incisal distance in group I increases from relative to the Baseline on both the 14th and the 28th days. A study conducted by Jayraj et al. [29] demonstrates a decrease postoperative complications like trismus. Conversely, patients in group II, who undergo surgical extraction without PRF incorporation, experience a higher occurrence of trismus. Another study by Shruthi et al. [30] indicate that utilizing PRF in the study group reduces the severity of trismus in comparison to the control group, leading to better treatment outcomes and postoperative results for the PRF group. However, there are some conflicting results also. [31,32]

Trismus is a significant immediate postoperative complication of impacted tooth removal surgeries, attributed to edema from surgical trauma. The extraction of third molars may restrict mouth opening due to inflammation affecting masticatory muscles, causing pain-induced muscle contractions and reduced range of motion. Since trismus results from pain and swelling, PRF administration to address these issues aids in enhancing mouth opening capabilities. [33] Leukocytes can release numerous cytokines that are connected to immune regulations during the process of fibrinolysis, which occurs continuously and gradually. These cytokines can effectively decrease local inflammatory responses. In research led by Karaca et al., the PRF group shows low levels of ESR and CRP on the 2nd day post-surgery, a time when edema is usually at its peak, possibly due to the strong anti-inflammatory properties of PRF applied locally. The observation that these levels peaked on the 2nd day post-surgery in both groups aligns with the documented timeline for maximum edema following third molar surgery in the existing literature. The lack of significant differences in these markers on the 7th day indicates that they are more relevant in the early phase of the inflammatory response. Notably, the ESR levels on the 2nd and the 7th days were unusually low in the PRF group, which may not be directly linked to edema and trismus levels.[23]

However, this study did not find any incidence of alveolar osteitis among the participants in between case group or control group. Nevertheless, insignificant role of PRF in the incidence of AO is found. This could be related to the small sample size, good health of the patients, and the strict oral hygiene instructions followed by patients included in this study. In addition, this study has no patient with habits like smoking, drinking or patient taking OCP, or had other morbidity. Another aspect that might influence the occurrence of aphthous ulcers is irrigation. Butler and Sweet [34] note that increased irrigation volumes can decrease the likelihood of aphthous ulcer formation by enhancing the removal of contaminants (such as debris, bacteria, and enzymes) more effectively with larger irrigation quantities (minimum of 40 mL of normal saline). The frequency of AO is also age dependent. In the current study, the distribution of AO is evaluated in only 18-30 years with the mean age 25.4 ± 2.8 years, which is on a lesser side on incidence of alveolar osteitis.

6. CONCLUSIONS:

In conclusion, from this study, it can be summarized that Platelet Rich Fibrin (PRF) appears to be beneficial and effective in lowering postoperative discomforts and complications in lower third molar surgery. The researchers can comment that PRF effectively decreases pain, swelling and trismus when compared with the case and control groups. However, the researchers cannot comment on its effectiveness on incidence of alveolar osteitis.

This study has some limitations. The researchers have a small sample size and a split mouth study design might be better. The clinical evaluation of inflammatory responses such as pain, swelling and trismus assessment after the mandibular

Advances in Medical, Pharmaceutical and Dental Research Journal (AMPDR)- ISSN 2812-4898
http://dx.doi.org/10.21622/AMPDR.2024.04.2.1031

third molar surgery is valuable but subjective. These parameters can be affected by many variables, including the patient's cooperation, the investigator's measurement method, and the appliances required for the measurement, and these factors may affect the results obtained.

Acknowledgments and Disclosure Statements

The authors report no conflicts of interest related to this study. The authors would like to thank the Department of Oral and Maxillofacial Surgery of Guru Nanak Institute of Dental Sciences and Research for immense help in this study.

7. TABLES:

Table 1: Patient Demographic Data:

SL No	Group	Age	Sex	Site	Pederson Difficulty Index	Modified Parant Scale
1	I	20	M	38	5	2
2		30	M	38	6	3
3		29	M	48	6	4
4		26	M	38	6	4
5		27	F	48	5	3
6		30	M	38	4	3
7		23	M	48	4	2
8		27	F	48	4	3
9		25	M	48	4	3
10		22	M	48	5	4
11		24	F	38	3	2
12		22	M	48	5	4
13		25	F	38	4	3
1	II	23	F	38	5	4
2		23	M	48	4	3
3		25	M	38	4	4
4		22	M	38	4	4
5		30	F	48	5	4
6		24	F	48	3	2
7		25	M	38	4	2
8		26	F	48	5	3
9		26	M	48	4	3
10		30	M	38	3	3
11		27	M	48	5	3
12		23	F	38	5	3
13		26	F	38	5	4
P value		*P*=0.35	*P*=0.42	*P*=0.62	*P*=0.29	*P*=0.85

Table 2: Distribution of study subjects according to the requirement of rescue analgesics

Status	Group I (*n*=13)	Group II (*n*=13)	Total (*N*=26)
Not Required	10(76.9%)	2(15.4%)	12(46.2%)
Required	3(23.1%)	11(84.6%)	14(53.8%)

Values expressed in Frequencies (Percentage) N: Total sample size; n:sample size per group

Table 3: Descriptive statistics and Comparison of Intergroup VAS scores for pain

Post operative time points	Group I (*n*=13)	Group II (*n*=13)	*P* value
1st hour	15.4±9.67	16.5±12.1	>0.9999ns
2nd hour	51.2±22.2	78.8±20	0.0014**
4th hour	40.8±16.6	51.2±27.1	0.6957ns
6th hour	32.7±18.3	47.3±23	0.2835ns
12 hours	26.2±13.3	50.8±15.4	0.0063**
24 hours	31.2±19.6	40±17.8	0.8342ns
48 hours	22.7±22	28.5±15.2	0.9804ns
72 hours	12.3±10.1	16.9±9.47	>0.9999ns

ns: not significant (P >0.05), *: statistically significant (P <0.05), **: highly statistically significant (P<0.01)

Table 4: Comparison of the change in swelling measurements to the Baseline (cm) between the groups

Difference of Post-Operative Follow-up periods (with Baseline)	Sites	Group I(n=13)	Group II(n=13)	P value
Pre-Operative/ Baseline	I	7.16±0.822	6.75±0.826	0.77ns
	II	11.1±0.64	10.3±0.945	0.13ns
	III	11.2±0.967	10.8±1.05	0.78ns
	IV	9.41±0.696	9.38±1.21	0.99ns
	V	11.4±0.778	10.7±1.07	0.24ns
3rd day	I	0.615±0.27	0.631±0.17	0.99ns
	II	0.831±0.281	0.954±0.254	0.21ns
	III	0.908±0.0954	1.12±0.248	0.005**
	IV	1.08±0.331	1.49±0.548	0.004**
	V	0.931±0.572	1.13±1.06	0.69ns

7th day	I	0.2±0.178	0.262±0.0961	0.74ns
	II	0.231±0.103	0.438±0.104	0.007**
	III	0.408±0.138	0.577±0.22	0.03*
	IV	0.554±0.198	0.7±0.3	0.55ns
	V	0.3±0.141	0.4±0.1	0.94ns
14th Day	I	0.1±0.122	0.223±0.0927	0.19ns
	II	-0.00769±0.0494	0.154±0.0967	0.04*
	III	0.0385±0.087	0.177±0.124	0.09ns
	IV	0.108±0.166	0.192±0.198	0.89ns
	V	-0.00769±0.0641	-0.00769±0.325	0.99ns

ns: not significant (P >0.05), *: statistically significant (P <0.05), **: highly statistically significant (P<0.01)

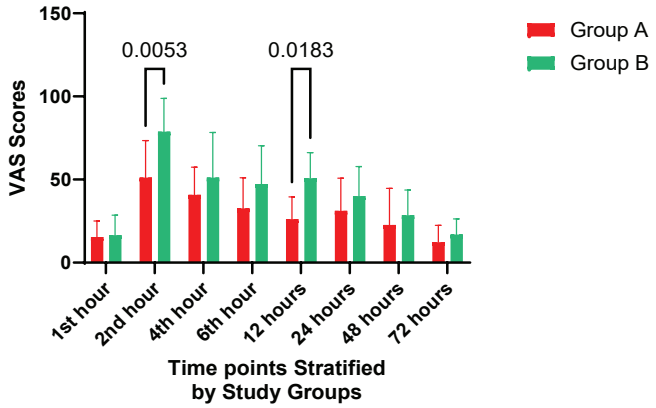
Table 5: Comparison of the change in inter-incisal distance (mm) to the Baseline (mm) between the groups

Difference of Post-Operative Follow-up periods (with Baseline)	Group I(*n*=13)	Group II(n=13)	*P* value
3rd day	-16±5.63	-19.8±5.06	0.9432ns
7th day	-4.07±3.71	-13.4±7.41	0.0069**
14th day	0.423±4.49	-9.45±8.74	0.0008**
28th day	4.62±4.38	-1.38±3.79	0.0819ns

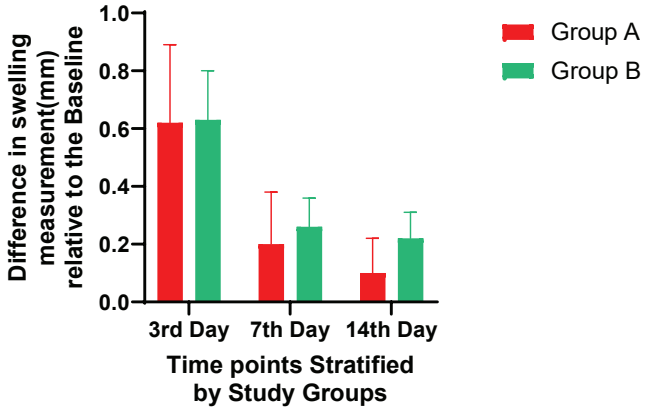
ns: not significant (P >0.05), *: statistically significant (P <0.05), **: highly statistically significant (P<0.01)

8. BAR CHARTS:

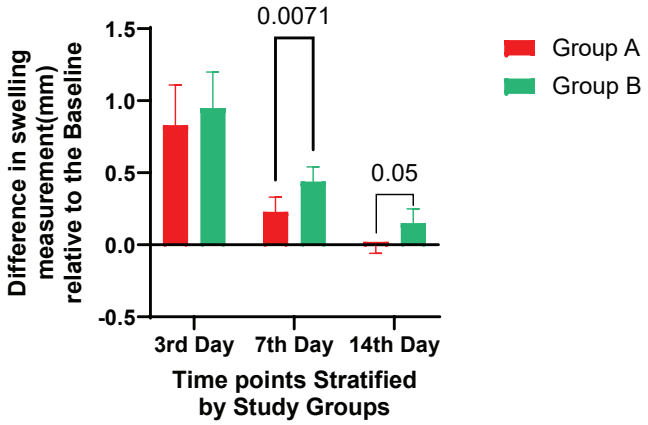
Bar Graph 1: Inter-group Comparisons of the VAS scores for pain for each of the follow-up periods



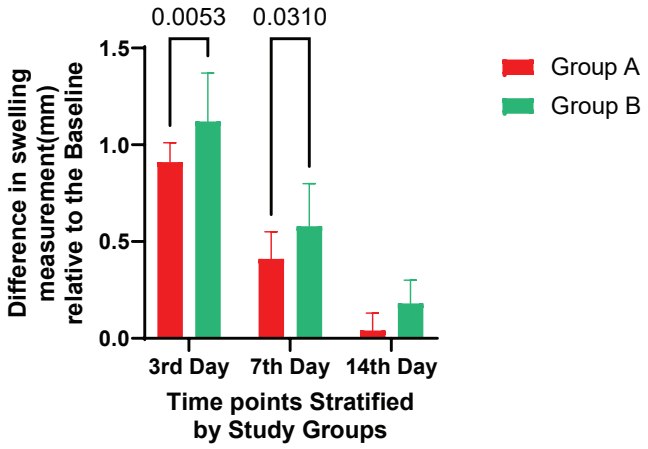
Bar Graph 2.1: Comparison of the change in swelling measurements for Site I relative to the Baseline (cm) between the groups at all follow-up periods



Bar Graph 2.2: Comparison of the change in swelling measurements for Site II relative to the Baseline (cm) between the groups at all follow-up periods

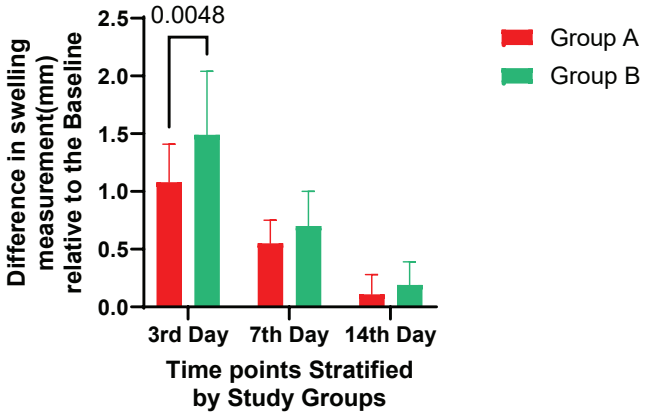


Bar Graph 2.3: Comparison of the change in swelling measurements for Site III relative to the Baseline (mm) between the groups at all follow-up periods

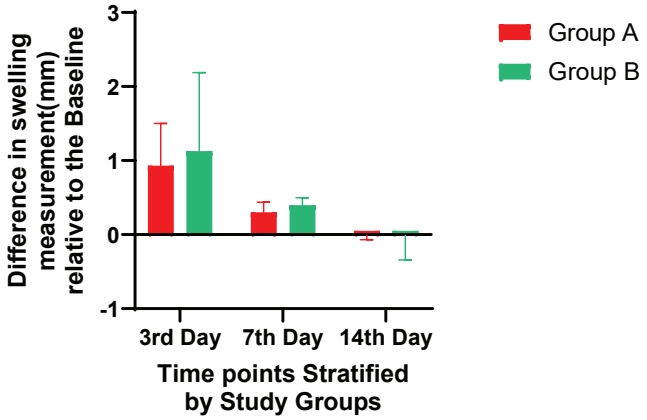


Advances in Medical, Pharmaceutical and Dental Research Journal (AMPDR)- ISSN 2812-4898
http://dx.doi.org/10.21622/AMPDR.2024.04.2.1031

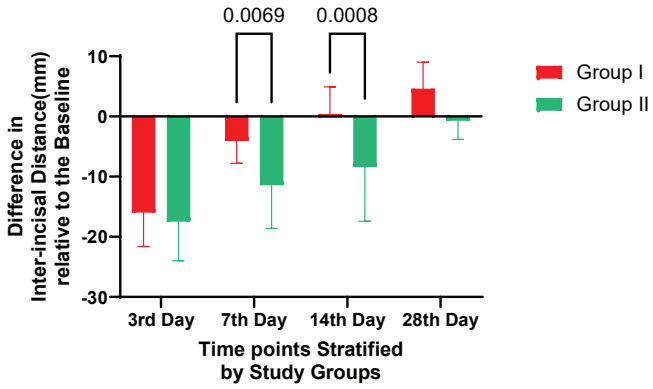
Bar Graph 2.4: Comparison of the change in swelling measurements for Site IV relative to the Baseline (cm) between the groups at all follow-up periods



Bar Graph 2.5: Comparison of the change in swelling measurements for Site V relative to the Baseline (mm) between the groups at all follow-up periods



Bar Graph 3: Comparison of the change in inter-incisal distance (cm) relative to the Baseline (mm) between the groups



9. FIGURES:

Fig. 1. Preparation of PRF

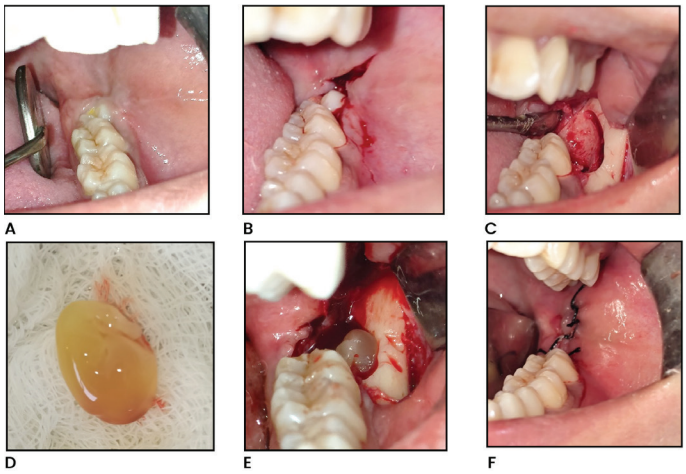


Fig. 2. Procedure

A. Impacted mandibular third molar
B. incision given
C. Teeth extracted
D. Autologous PRF made
E. placed into socket
F. suturing done by 3-0 mersilk

Advances in Medical, Pharmaceutical and Dental Research Journal (AMPDR)- ISSN 2812-4898
http://dx.doi.org/10.21622/AMPDR.2024.04.2.1031
Dec. 2024
Volume 4
Issue 2

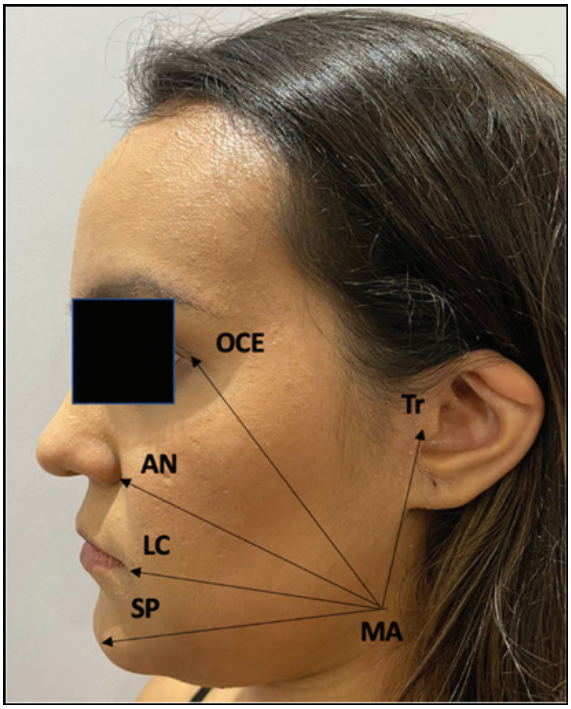


Fig. 3. Linear measurements of facial swelling by taking 5 points from mandibular angle

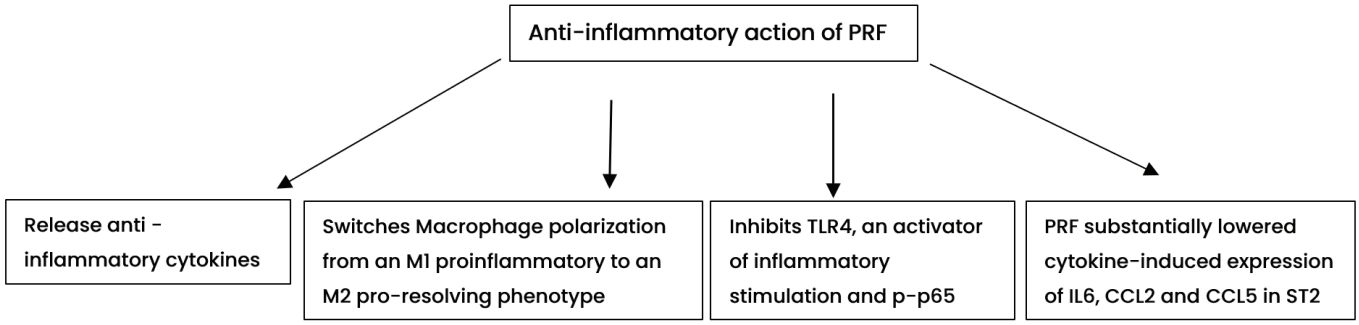


Fig. 4. Schematic Diagram of anti-inflammatory action of PRF

Advances in Medical, Pharmaceutical and Dental Research Journal (AMPDR)- ISSN 2812-4898
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