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# Management of Pain, Swelling, Healing and Bone Regeneration after Removal of Lower Arch Wisdom Teeth

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**Abstract:- Partially impacted third molars exposed to the oral environment pose a heightened risk of periodontal infection and attachment loss. Despite careful surgical techniques and perioperative care, complications such as edema, pain, and trismus remain challenging to eliminate completely. To address these concerns, Platelet-Rich Fibrin (PRF), a novel autologous platelet concentrate, offers promise. PRF contains high concentrations of immune cells and growth factors within a slowly polymerizing fibrin matrix. This study investigates PRF's effects on postoperative healing, pain, swelling, and bone density in symmetrically impacted mandibular third molar. Sparse evidence calls for a comprehensive evaluation of PRF's potential benefits in enhancing postoperative sequelae.**

## I. INTRODUCTION

A partially impacted third molar exposed to the oral environment is more susceptible to periodontal infection, and thus to greater periodontal attachment loss. Careful surgical technique and perioperative care can minimize the frequency of complications and limit their severity[2]. Various pharmacological and/or extraction methods have been used for maintaining patients social activities. These include non-steroid anti-inflammatory drugs, laser treatment, steroids and ultrasound. However, the amount and intensity of edema, pain and trismus occurring after surgical extraction cannot be eliminated completely[3-6].

In 2001, Choukroun et al.[9] introduced a new platelet concentrate termed platelet-rich fibrin (PRF). This novel formulation is completely autologous, prepared without any anticoagulants, and contains high concentrations of host immune cells[13]. Choukroun et al[9] developed plateletrich fibrin (PRF), an autologous fibrin product belonging to a new generation of platelet concentrates[8]. They claimed that PRF is a slowly and naturally polymerizing fibrin matrix in which growth factors (PDGF-ββ, TGF β1, VEGF, and insulin-like growth factor- 1), leukocytic cells, and their cytokines (interleukin [IL]-1β, IL-6, IL 4, and tumor necrosis factor-β) are enmeshed[9-10].

Evidence regarding the effect of PRF on the post-operative sequelae after third molar surgery is sparse. Therefore, the aim of this study is to evaluate the postoperative extraction socket healing, pain, swelling, and bone density following symmetrically impacted mandibular third molar disimpaction with or without Platelet-rich fibrin as a healing material in the extraction sockets.

## II. MATERIALS AND METHODS

This study was an prospective Comparative Qualitative Analytical in-vivo study design. This study was conducted on 20 patients in the department of Oral & Maxillofacial Surgery. Ethical clearance was obtained from Ethical Committee. A detailed case history and clinical examination was carried out for all patients requiring bilateral mandibular third molar disimpaction surgery. Total sample size was 40 extraction sites in 20 patients. Divided into two groups. Where 20 sites was divided into Group I (study group) and Group II (control group) each. Simple random sampling technique was used. To select the site as study group coin test method was used. The data was analyzed using descriptive statistical methods including the independant 't' test.

- **Group I (STUDY GROUP)**: Impacted mandibular third molars extraction site where platelet rich fibrin was placed in the socket followed by closure with 3-0 mersilk sutures.
- **Group II (CONROL GROUP)**: Impacted mandibular third molars extraction site was closed conventionally with 3-0 mersilk sutures without platelet rich fibrin.

Sample sites of 20 per group was considered. The total sample sites were 40. The data was analyzed using descriptive statistical methods including the Paired samples 't' test.

Clinical inclusion, exclusion and withdrawal criteria was as follow:

*A. Inclusion criteria:*

- Patient between age group 18 years to 40 years were included in the study.
- Bilateral mandibular impacted third molars which have the same or similar degree of impaction comparing one side with the other.

*B. Exclusion criteria:*

- Patient below the age of 18 years and above 40 was not included in the study.
- Medically compromised patients were not selected.
- Patient with bilateral asymmetrical mandibular third molar impaction.
- Patient with bony pathology associated with impacted tooth.

**Pell and Gregory** classification was used to determine the difficulties of the patients included in the study. Prior to their inclusion in the study an informed consent from the patient has been obtained. For selection of study group sites

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coin toss method used. All patients underwent bilateral removal of mandibular 3rd molar that were the same degree of surgical difficulty in two appointment where 7 days of gap was present between appointments. For selection of study group sites coin toss method was used. For group I first preparation of PRF was done.

➢ *Preparation of PRF:*

Prior to the extractions, 10 ml of venous blood was collected from median cubital vein in each patient by a surgical nurse and was placed in glass-coated plastic tubes. Tubes were transferred to a centrifuge device and centrifuged for 10 min at 3000 rpm (fig.1) according to **Choukroun et al.**[11] Following centrifugation, PRF was dissected approximately 2 mm below its connection to the red corpuscle beneath to include remaining platelets, which have been proposed to localize below the junction between PRF and the red corpuscle.

➢ *Surgical procedure:*

Facial skin preparation was done using betadine scrub and standard draping procedure. Intra oral irrigation was done using normal saline with chlorhexidine (0.2%) solution. Mandibular nerve block and buccal block of local anesthesia secured with 2% lignocaine hydrochloride and 1:80,000 adrenalin. After effective local anesthesia with 2% lignocaine. Ward's I incision was given and full thickness mucoperiosteal flap was reflected and tooth was exposed. Under copious amount of saline bone guttering was done and tooth sectioning performed. After that tooth was removed out of the socket (fig.3) socket was thoroughly curated and irrigated with povidin iodin solution. After achieving hemostasis PRF was placed in the socket (fig.4) and site was closed using 3-0 mersilk suture. After 7 days, group II site with same surgical protocol was used except PRF was not placed and site was allowed to heal conventionally (fig.5).

Post-operatively Tab. Amoxicillin + Clavulanic acid = 500 mg + 125 mg three times a day, Tab. Acelofenac + paracetomol + Serratiopeptidase = 100 mg + 325 mg + 15 mg 2 times per day, Tab. Rabeprazole = 20 mg twice in a day and chlorhexidine (0.2%) mouth wash had been advised to be used after 24 hours of surgery.

Post-operatively evaluation of pain, swelling, bone density and healing was done in all patients. Patients were not told about the knowledge of PRF.

Post-operative pain has been evaluated in all 20 patients by Horizontal Visual Analogue Scale by **Hayes and Patterson** (1921), after 24 hours, on 3rd day, on 7th days. Pain VAS scale was taken postoperatively and response of pain was noted as 0 –No pain, 1-3 Low pain, 4-6 Moderate pain and 7-10 severe pain.

Post-operative facial swelling was recorded in all 20 patients with VAS given by **Peñarrocha-Diago M (2012),** after 24 hours, on 3rd day, on 7th days. In order to ensure maximum homogeneity in the patient registered scores, the following scoring system was used. **0** - No swelling – Absence of swelling in the operated area. **1-3 -** Mild swelling – Swelling located within mouth in the surgical zone only. **4-6 -** Moderate swelling – Swelling located within the mouth (vestibular) and with mild swelling also outside the mouth. **7-9 -** Intense swelling - Outside the mouth in the surgical zone. **10 -** very Intense - Extraoral swelling extending beyond surgical zone.

Post-operative healing has been evaluated in all 20 patients by 24 hours, on 3rd day, on 7th days using the healing index by **Landry Et Al**[18] .

Post-operative bone density has been evaluated in all 40 sites at 24 hours, 1 month and after 3 month. Assessment of bone density calculated by technique described by **Savina gupta et al in the year (2020)**.[16] The orthopantomogram images were transferred to software and converted to grayscale tonalities of 256. Auto-tracing of the size of the residual cavity using a magnetic tool was done for extraction socket of 24 hrs; same marking was transferred to 1 month and 3 month opg. The area marked was converted into a histogram. Bone density was measured by means of histogram. Changes in alveolar bone level were measured by means of histogram (adobe photoshop).

All the surgeries was performed by same surgeon. The assessment of pain, swelling, healing and bone density was done by another surgeon who were blinded about the surgical procedures.

## III. RESULTS AND OBSERVATIONS

The observations obtained in the study were subjected to statistical analysis, so as to get their interpretation. Data was coded, transferred and analyzed on SPSS version 9.

The following statistical analyses were carried out in this study:

- Mean value
- Standard deviation
- Mann-Whitney U test.
- Independent Students-T

*A. Pain:*

The difference in pain between groups A and B after 24 hours of surgery was statistically significant with p-value 0.014, analyzed using Mann-Whitney U test (Table 1 and graph 1). Thus, 24 hours after the surgery the participants in group B experienced significantly more pain as compared to group A. A and B after 3 days of surgery was statistically significant with p-value 0.042, analyzed using Mann-Whitney U test (Table 2 and graph 2). Thus, 3 days after the surgery the participants in group B experienced significantly more pain as compared to group A. Difference in pain after 7 days of surgery between groups A and B was statistically not significant with p-value 0.712, analyzed by Mann-Whitney U test (Table 3 and Graph 3).

*B. Bone Density:*

The difference in bone density between groups A and B after 1 month of surgery was analyzed by Independent Students-T test and it was found statistically significant with p-value 0.017. Thus, the bone density was significantly more in group A as compared to group B after 1 month of surgery. The difference in bone density between groups A and B after 3 months of surgery was analyzed by Independent Students-

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T test and it was found statistically significant with p-value 0.001. Thus, the bone density was significantly more in group A as compared to group B after 3 months of surgery.

*C. Healing:*

The difference in healing between groups A and B after 24 hours of surgery was statistically significant with p-value 0.004, analyzed using Mann-Whitney U test (Table 5 and graph 5.) Thus, 24 hours after the surgery the participants in group A showed significantly better healing as compared to group B. The difference in healing between groups A and B after 3 days of surgery was statistically significant with p-value 0.02, analyzed using Mann-Whitney U test (Table 6 and graph 6.) Thus, 3 days after the surgery the participants in group A showed significantly better healing as compared to group B. The difference in healing between groups A and B after 7 days of surgery was statistically significant with p-value 0.031, analyzed using Mann-Whitney U test (Table 7 and graph 7). Thus, 7 days after the surgery the participants in group A showed significantly better healing as compared to group B.

*D. Swelling:*

The difference in swelling between groups A and B after 24 hours of surgery was statistically significant with p-value 0.015, analyzed using Mann-Whitney U test (Table 8 and graph 8). Thus, 24 hours after the surgery the participants in group B showed significantly more swelling as compared to group A. The difference in swelling between groups A and B after 3 days of surgery was statistically significant with p-value 0.021, analyzed using Mann-Whitney U test (Table 9 and graph 9). Thus, 3 days after the surgery the participants in group B showed significantly more swelling as compared to group A. The difference in swelling between groups A and B after 7 days of surgery was statistically not significant with p-value 0.137, analyzed using Mann-Whitney U test (Table 10 and graph 10). Thus, 7 days after the surgery there was no significant difference in swelling between groups A and B.

## IV. DISCUSSION

This study was aimed to evaluate and compare post –operative soft tissue healing and post –operative complications like pain, swelling at experimental and control site clinically on 1 day, 3rd day and 7th day. Also to evaluate and compare bone regeneration potential of platelet rich fibrin using histogram values of OPG in post extraction socket healing at experimental and control site radiographically at 1 day, 1st and 3rd month.

Our study included 20 healthy patients who were referred to the Oral Surgery department for bilateral removal of mandibular 3rd molar surgery. Patients who fulfilled the eligibility criteria were selected. The extraction sites were divided into two groups randomly using flipping the coin. The randomly selected extraction sites were categorized into two groups; in which Group I extraction sites were PRF was placed inside socket and Group II extraction sites were no PRF placement was done.

In our study, in Group I extraction sites consisted from 10 male patients and 10 female patients In Group II extraction sites consisted from 10 male patients and 10 female patients. Thus, the gender distribution among the two groups was found to be non-significant. The different Parameters assessed in our study were; Healing, Pain, Swelling and bone density at different time intervals of follow-up.

*A. Soft tissue healing:*

Soft tissue healing was assessed at the end of postoperative 24hrs, 3rd and 7th day. Soft tissue healing was assessed using the healing index proposed by **Landry et al**.[18] In post-surgery healing after 24 hours, it was found that in Group A 15% had score 1, 50% had score 2 and 35% had score 3; whereas, in Group B 25% had score 1, 75% had score 2 and 0% had score 3. The difference in healing between groups A and B after 24 hours of surgery was statistically significant with p-value 0.004, analyzed using Mann-Whitney U test. Thus, 24 hours after the surgery the participants in group A showed significantly better healing as compared to group B.

On 3rd day it was found that in Group A 15% had score 2, 85% had score 3; whereas, in Group B 40% had score 2, 60% had score 3 for healing. The difference in healing between groups A and B after 3 days of surgery was statistically significant with p-value 0.02, analyzed using Mann-Whitney U test. Thus, 3 days after the surgery the participants in group A showed significantly better healing as compared to group B. On 7th day it was found that in Group A 15% had score 3, 85% had score 4 for healing; whereas, in Group B 35% had score 3, 65% had score 4 for healing. The difference in healing between groups A and B after 7 days of surgery was statistically significant with p-value 0.031, analyzed using Mann-Whitney U test. Thus, 7 days after the surgery the participants in group A showed significantly better healing as compared to group B.

Thus Healing in both groups did show significant difference on the 24hrs, 3rd and 7th day postoperativly (*table no.4*). This is concurrent with the results of study conducted by **Yelamali T and Saikrishna D (2015)[14], Varghese MP, Manuel S, Kumar L K S (2017)[15].**

*B. Pain:*

The evaluation of the postoperative pain was performed after 24 hrs, on 3rd day and on 7th day post-operatively using 10-point visual analogue scale (VAS) with a score of -0- equals —no pain and —10 equals —very severe pain. Values of postoperative pain in all the groups were compared. Our results showed that there was significant difference found between the two groups in terms of postoperative pain after 24 hours and on 3rd day of follow-up.

After 24 hours it was found that in Group A 35% had score 3, 50% had score 5 and 15% had score 7; whereas, in Group B 75% had score 5 and 25% had score 7. The difference in pain between groups A and B after 24 hours of surgery was statistically significant with p-value 0.014, analyzed using Mann-Whitney U test. Thus, 24 hours after the surgery the participants in group B experienced significantly more pain as compared to group A.

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On day 3 it was found that in Group A 85% had score 2 and 15% had score 5; whereas, in Group B 60% had score 2 and 50% had score 5. The difference in pain between groups A and B after 3 days of surgery was statistically significant with p-value 0.042, analyzed using Mann-Whitney U test. Thus, 3 days after the surgery the participants in group B experienced significantly more pain as compared to group A.

On day 7 it was found that no pain (score 0) was seen in 85% and 65% of participants in group A and group B respectively. Score 2 was seen in 15% of participants in group A and 35% of participants in group B. However, the difference in pain after 7 days of surgery between groups A and B was statistically not significant with p-value 0.712, analyzed by Mann-Whitney U test.

Thus Pain in both groups did show significant difference on the 24hrs and 3rd day postoperativly (*table no.4*). These results of our study were in accordance with other different studies carried out by **Kumar N, Prasad K, Ramanujam L, (2014)[7] and Karimi K, Rockwell H. (2019)[12].**

*C. Swelling*

Post-operative facial swelling was recorded in all both Group A and Group B with VAS given by **Peñarrocha-Diago M (2012),** after 24 hours, on 3rd day, on 7th days post-operatively. Values of postoperative swelling in all the groups were compared. Our results showed that there was significant difference found between the two groups in terms of postoperative pain after 24 hours and on 3rd day of follow-up.

After 24 hrs it was found that in Group A 35% had score 3, 50% had score 5 and 15% had score 8 for swelling; whereas, in Group B 75% had score 5 and 25% had score 8 for swelling. The difference in swelling between groups A and B after 24 hours of surgery was statistically significant with p-value 0.015, analyzed using Mann-Whitney U test. Thus, 24 hours after the surgery the participants in group B showed significantly more swelling as compared to group A.

After 3 days it was found that in Group A 85% had score 3, 15% had score 5 for swelling; whereas, in Group B 60% had score 3 and 40% had score 5 for swelling. The difference in swelling between groups A and B after 3 days of surgery was statistically significant with p-value 0.021, analyzed using Mann-Whitney U test. Thus, 3 days after the surgery the participants in group B showed significantly more swelling as compared to group A.

After 7 days it was found that in Group A 85% had no swelling (score 0), 15% had score 3 for swelling; whereas, in Group B 65% had no swelling (score 0) and 35% had score 3 for swelling. The difference in swelling between groups A and B after 7 days of surgery was statistically not significant with p-value 0.137, analyzed using Mann-Whitney U test. Thus, 7 days after the surgery there was no significant difference in swelling between groups A and B.

Thus swelling in both groups did show significant difference on the 24hrs and 3rd day postoperativly (*table no.4*). These results of our study were in accordance with other different studies carried out by **Ozgul O, Senses F, Er N, (2015)[1] , Mathew P. Varghese (2017)[15] and Kumar N, Prasad K, Ramanujam L, (2014)[7].**

*D. Bone density:*

Bone density was evaluated in all 40 sites at 24 hours , 1 month and after 3 month.

Assessment of bone density was calculated by technique described by **Savina gupta et al in the year (2020).**[16]

The ORTHOPENTAMOGRAM images were transferred to software and converted to grayscale tonalities of 256. Auto-tracing (fig.6) of the size of the residual cavity using a magnetic tool was done for extraction socket of 24 hrs; same marking was transferred to 1 month and 3 month opg. The area marked was converted into a histogram. Bone density was measured by means of histogram. Changes in alveolar bone level were measured by means of histogram (adobe photoshop).

Our study compared study groups and control group based on post-surgery bone density observed at 24 hours, 1 month and 3 month. The mean bone density 24 hours after the surgery was 67.45 in both the study groups A and B, as the bone density was same in both the groups there was no statistical significance. The 24 hrs bone density after disimpaction was same as both extraction sockets was symmetrical as required by selection criteria. In our study 24 hrs post- operative opg was taken so that we could easily mark the extraction socket using magnetic tool; use the same selection on 1 month and 3 month opg to eliminate marking bias.

The mean bone density observed after 1 month of surgery was 115.95 in group A and 113.35 in group B. The difference in bone density between groups A and B after 1 month of surgery was analyzed by Independent Students-T test and it was found statistically significant with p-value 0.017. Thus, the bone density was significantly more in group A as compared to group B after 1 month of surgery.

After 3 months of the surgery, the mean bone density was 133.30 and 128.05 in group A and group B respectively. The difference in bone density between groups A and B after 3 months of surgery was analyzed by Independent Students-T test and it was found statistically significant with p-value 0.001. Thus, the bone density was significantly more in group A as compared to group B after 3 months of surgery.

Thus bone density in both groups did show significant difference on the 1 month and 3 month postoperativly (*table no.4*). These results of our study were in accordance with other different studies carried out by **Revathy NS, Kannan R, (2018)[17], Mathew P. Varghese (2017)[15] .**

We found that it was challenging to use the OPG finding for reliable numerical data because it was difficult to get absolutely 3 dimensional bone regeneration data on opg. Use of Cone bean computer tomography should be considerd for more accurate data.

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In this split-mouth study the mandibular third molars were symmetrically impacted and same surgeon was doing the removal of bilaterally symmetrically impacted mandibular third molars which allowed ease in standardizing the study to reach a very clean & precise result. PRF is particularly useful and efficient in controlling pain, swelling, healing and bone regeneration after removal of impacted third molar. Our study compared maximum criteria with two different types of treatment for bilaterally symmetrically impacted mandibular third molars in comparison to previous studies. All these contribute to strengths of our study.

Evaluation & validation of use of PRF in mandibular third molar extractions & standardizing treatment protocols regarding the usage of PRF calls for more emerging studies with considerable sample size.

## V. CONCLUSION

While comparing postoperative wound healing on 24hrs, 3rd day and 7th day there was statistically significant difference noted. For postoperative complications like pain and swelling clinically on 24 hrs and 3rd day there was statistically significant difference was noted. When we compared bone healing with help of histogram values at end of 1st and 3rd month postoperatively statistically significant difference was noted. So our result can conclude that PRF aids in faster tissue healing with less complication like pain and swelling

We found that, PRF is easy to prepare, non-toxic and biocompatible to living tissues and relatively more economic and can be definitely used in cases which need faster healing. PRF appears effective in reducing postoperative swelling, pain following third molar surgery. PRF also aid in healing of tissues post operatively in order to reduce swelling following third molar extraction surgery, PRF may be employed.

Our study included only smaller bone defects like extraction socket, there is a need for studies with bigger sample size in patients with larger defects. Also for the assessment of bone regeneration by PRF, use of CBCT scans considered to have an accurate data.

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Table 1: Comparison of study groups based on post-surgery pain after 24 hours

| **Study groups** | **Post-surgical pain after 24 hours (VAS score)** | | | **p-value** |
|---|---|---|---|---|
| | Score 2 | Score 5 | Score 7 | |
| Group A | 35% | 50% | 15% | 0.014* |
| Group B | 0 | 75% | 25% | |

*Statistically Significant value

Table 2: Comparison of study groups based on post-surgery pain after 3 days

| **Study groups** | **Post-surgical pain after 3 days (VAS score)** | | **p-value** |
|---|---|---|---|
| | Score 2 | Score 5 | 0.042* |
| Group A | 85.0% | 15.0% | |
| Group B | 60.0% | 40.0% | |

*Statistically Significant value

Table 3: Comparison of study groups based on post-surgery pain after 7 days

| **Study groups** | **Post-surgical pain after 7 days (VAS score)** | | **p-value** |
|---|---|---|---|
| | Score 0 | Score 2 | 0.712 |
| Group A | 85.0% | 15.0% | |
| Group B | 65.0% | 35.0% | |

*Statistically Significant value

Table 4: Comparison of study groups based on post-surgery bone density observed at different time intervals

| **Study Group** | **Bone Density after 24 hours** | | **Bone Density after 1 month** | | **Bone Density after 3 months** | |
|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Mean | Std. Deviation | Mean | Std. Deviation |
| Group A | 67.45 | 3.170 | 115.95 | 1.877 | 133.30 | 1.657 |
| Group B | 67.45 | 3.170 | 113.35 | 2.323 | 128.05 | 2.874 |
| p-value | 1 | | 0.017* | | 0.001* | |

*Statistically Significant value

Table 5: Comparison of study groups based on post-surgery healing after 24 hours

| **Study groups** | **Post-surgical healing after 24 hours** | | | **p-value** |
|---|---|---|---|---|
| | Score 1 | Score 2 | Score 3 | |
| Group A | 15.0% | 50.0% | 35.0% | 0.004* |
| Group B | 25.0% | 75.0% | 0.0% | |

*Statistically Significant value

Table 6: Comparison of study groups based on post-surgery healing after 3 days

| **Study groups** | **Post-surgical healing after 3 days** | | **p-value** |
|---|---|---|---|
| | Score 2 | Score 3 | 0.02* |
| Group A | 15.0% | 85.0% | |
| Group B | 40.0% | 60.0% | |

*Statistically Significant value

Table 7: Comparison of study groups based on post-surgery healing after 7 days

| **Study groups** | **Post-surgical healing after 7 days** | | **p-value** |
|---|---|---|---|
| | Score 3 | Score 4 | 0.031* |
| Group A | 15.0% | 85.0% | |
| Group B | 35.0% | 65.0% | |

*Statistically Significant value

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Table 8: Comparison of study groups based on post-surgery swelling after 24 hours

| **Study groups** | **Post-surgical swelling after 24 hours** | | | **p-value** |
|---|---|---|---|---|
| | Score 3 | Score 5 | Score 8 | |
| Group A | 35.0% | 50.0% | 15.0% | 0.015* |
| Group B | 0.0% | 75.0% | 25.0% | |

*Statistically Significant value

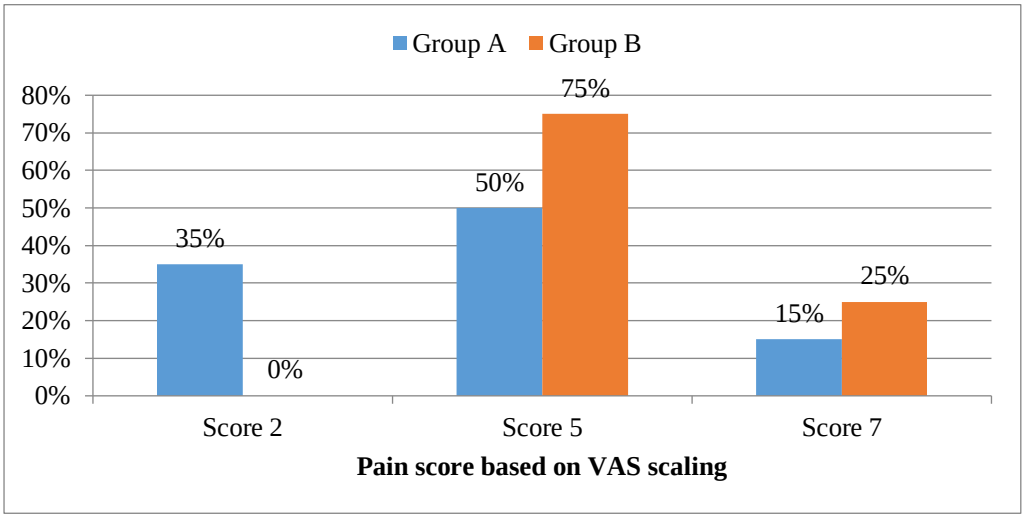
Table 9: Comparison of study groups based on post-surgery swelling after 3 days

| **Study groups** | **Post-surgical swelling after 3 days** | | **p-value** |
|---|---|---|---|
| | Score 3 | Score 5 | 0.021* |
| Group A | 85.0% | 15.0% | |
| Group B | 60.0% | 40.0% | |

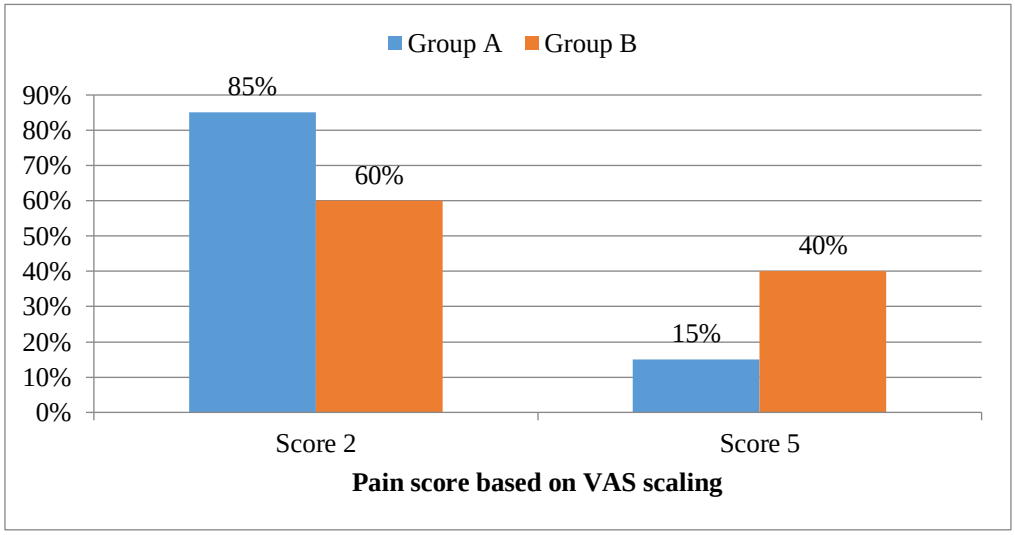
*Statistically Significant value

Table 10: Comparison of study groups based on post-surgery swelling after 7 days

| **Study groups** | **Post-surgical swelling after 7 days** | | **p-value** |
|---|---|---|---|
| | Score 0 | Score 3 | 0.137 |
| Group A | 90.0% | 10.0% | |
| Group B | 70.0% | 30.0% | |




Graph 1: Comparison of study groups based on post-surgery pain after 24 hours




Graph 2: Comparison of study groups based on post-surgery pain after 3 days

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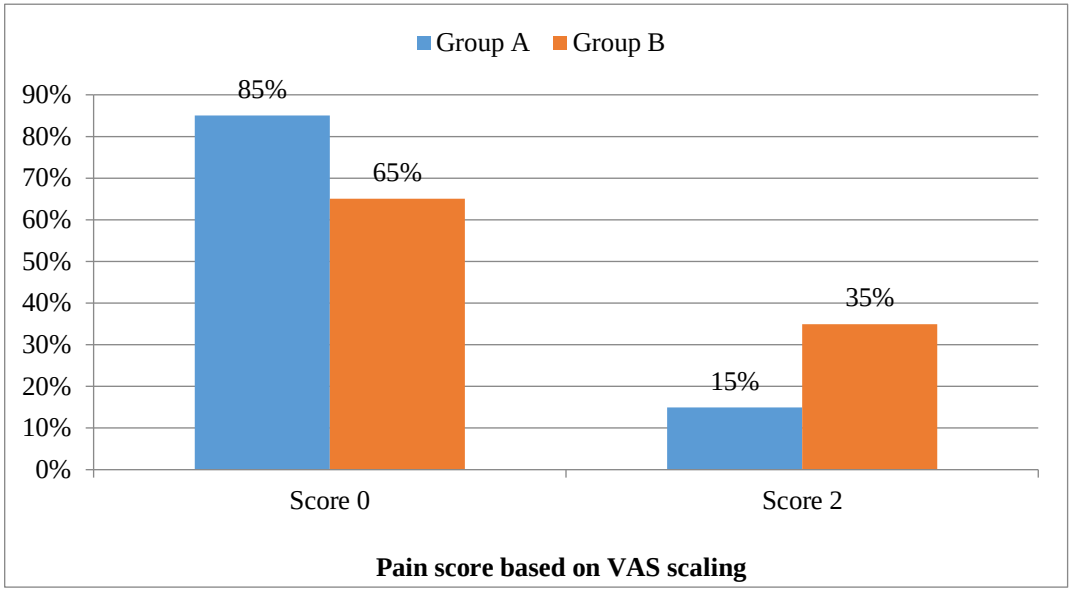
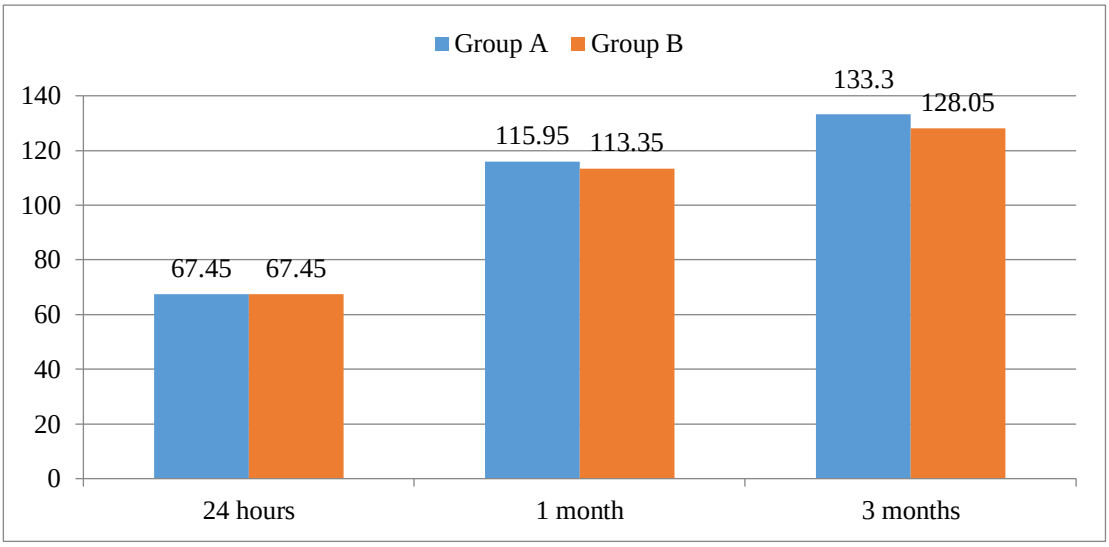
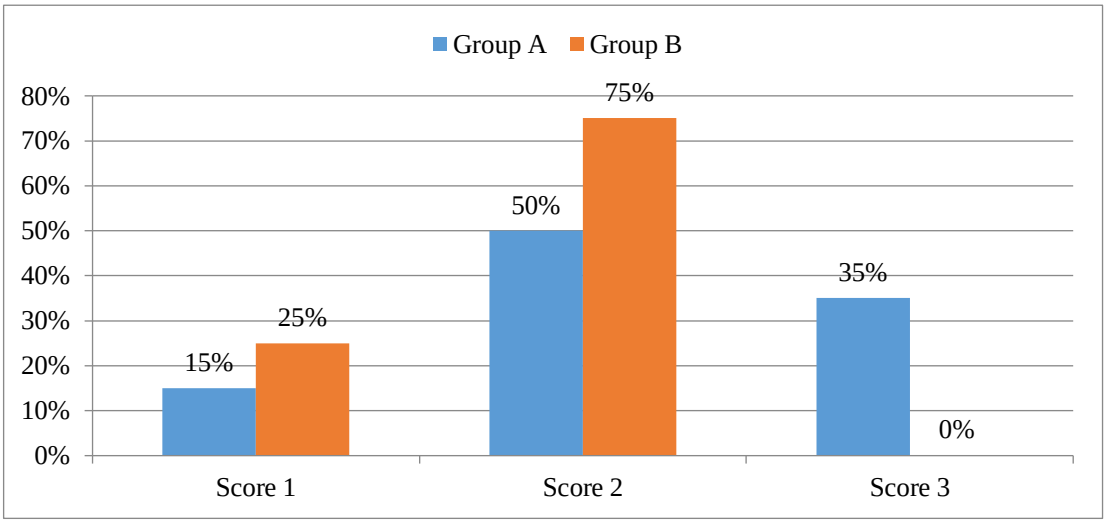



Graph 3: Comparison of study groups based on post-surgery pain after 7 days




Graph 4: Comparison of study groups based on post-surgery bone density observed at different time intervals




Graph 5: Comparison of study groups based on post-surgery healing after 24 hours

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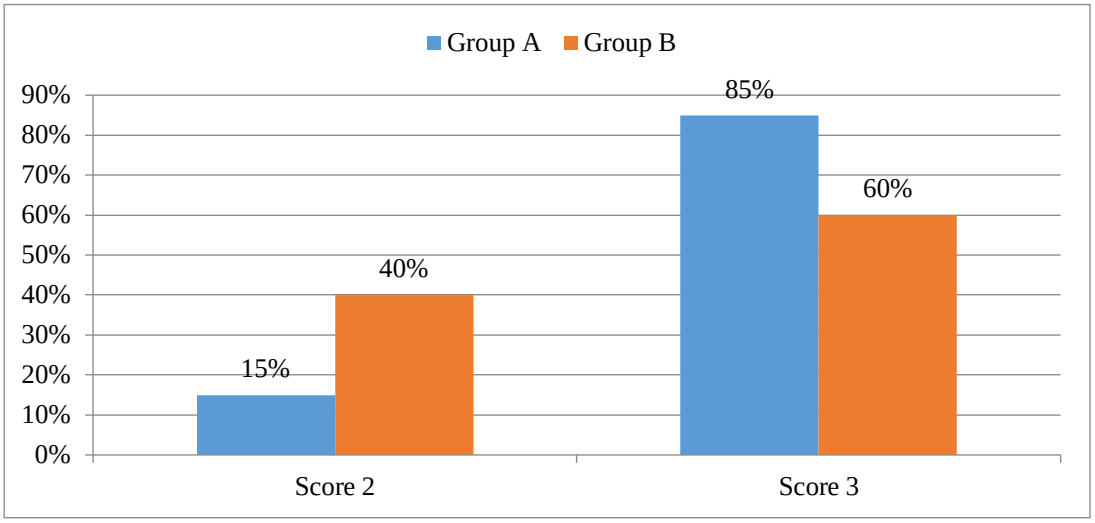
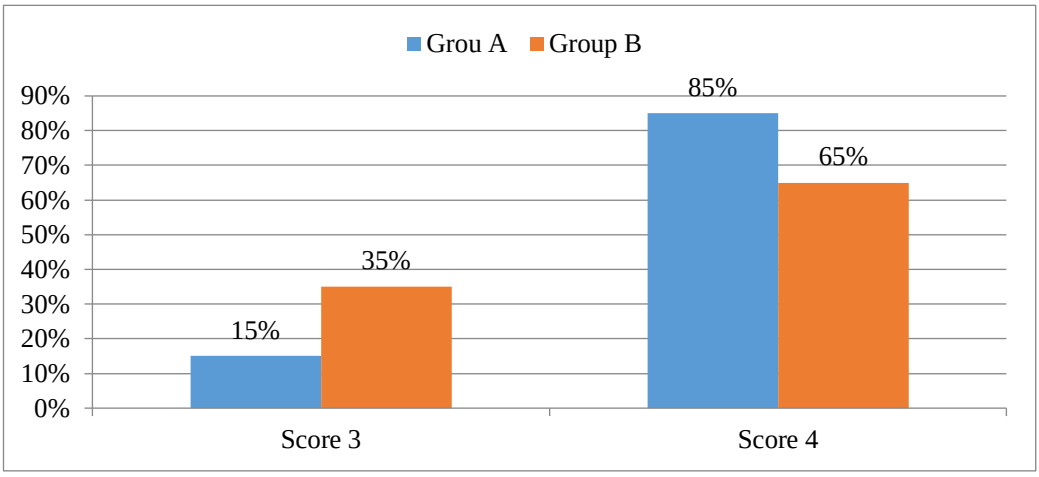
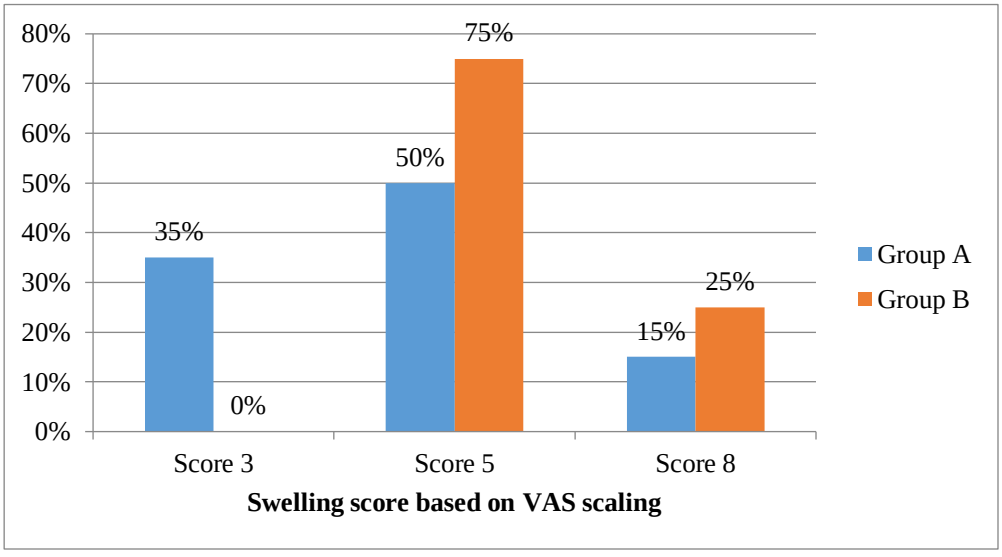



Graph 6: Comparison of study groups based on post-surgery healing after 3 days




Graph 7: Comparison of study groups based on post-surgery healing after 7 days




Graph 8: Comparison of study groups based on post-surgery swelling after 24 hours

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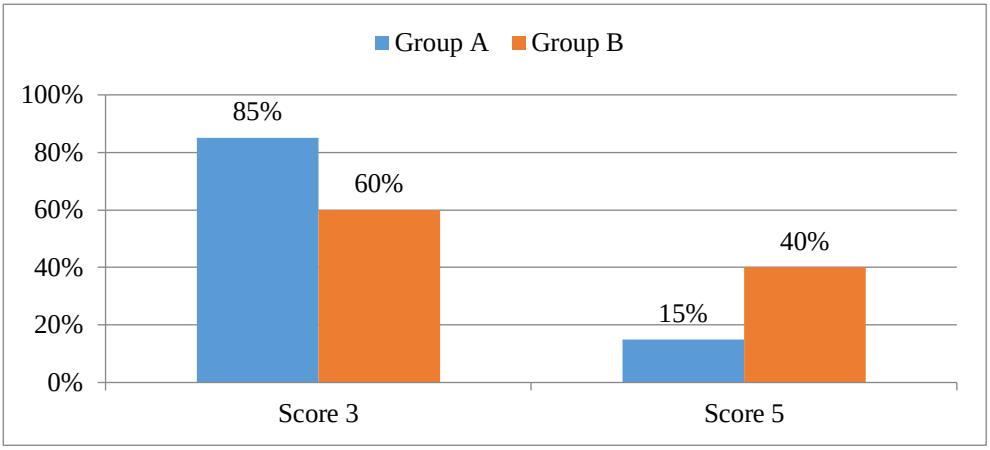
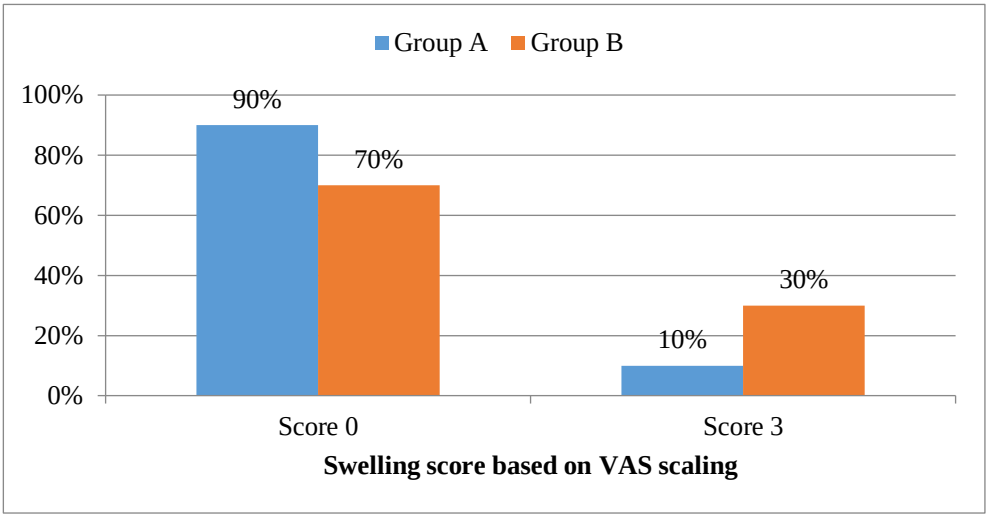



Graph 9: Comparison of study groups based on post-surgery swelling after 3 days




Graph 10: Comparison of study groups based on post-surgery swelling after 7 days

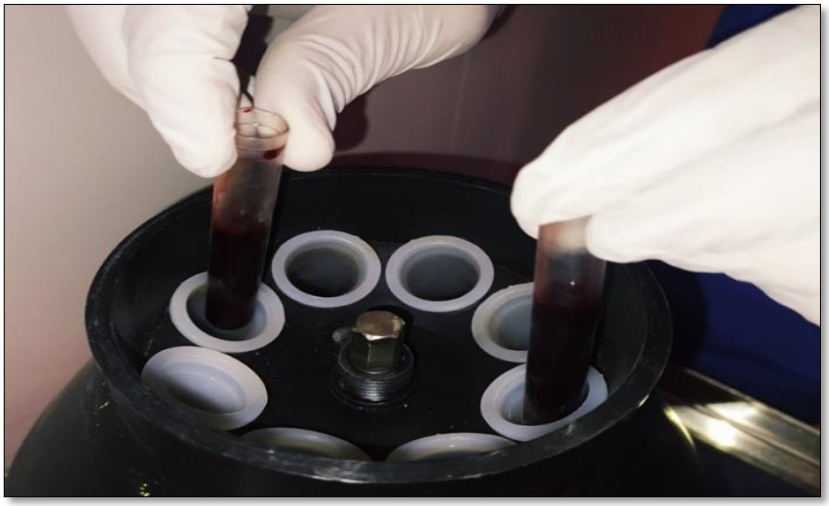


Fig.1 Preparation of PRF

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Fig. 2: Pre-op photo

Fig. 3: Removal of right 3rd molar

Fig. 4: PRF placed in right socket

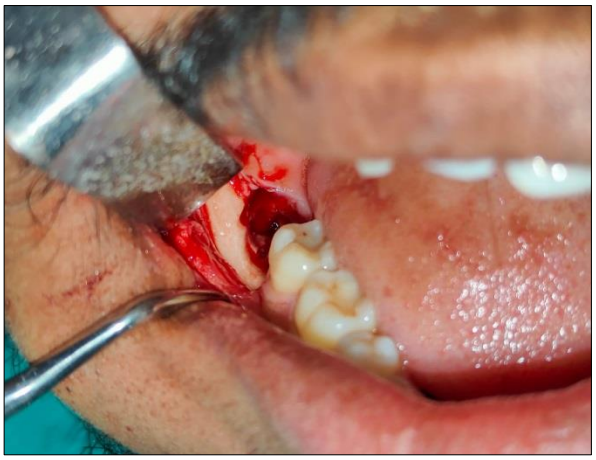

Fig. 5: Removal of left 3rd molar

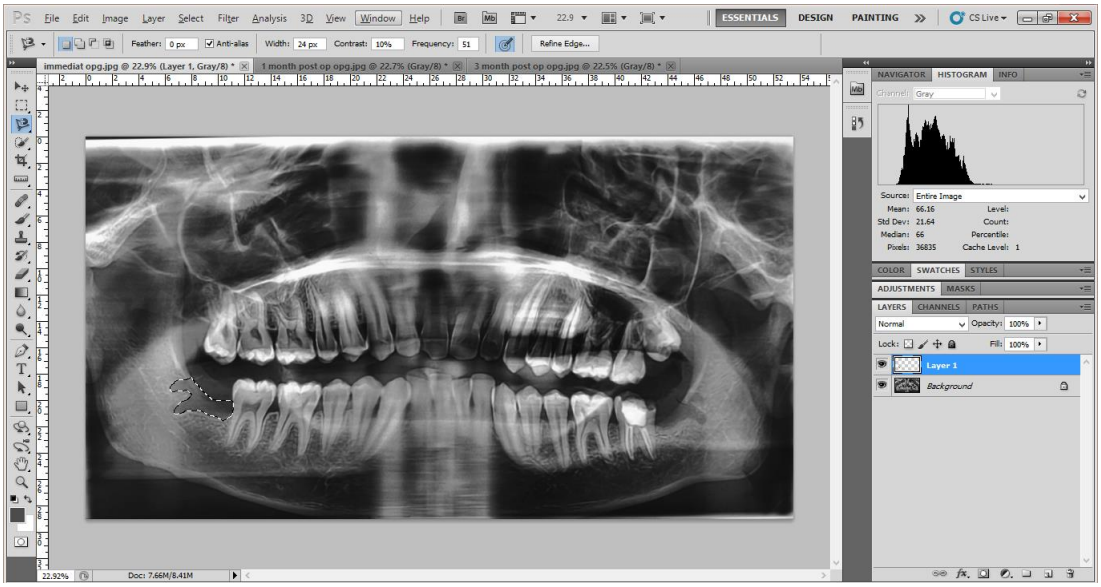


Fig. 6: Image uploaded on photoshop CS 5.1 to check histogram values