

COMPARATIVE EVALUATION OF THE EFFICACY OF PRF, OZONATED OLIVE OIL AND BLUEM GEL APPLICATION ON WOUND HEALING FOLLOWING GINGIVECTOMY/GINGIVOPLASTY PROCEDURES: A PILOT STUDY

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Abstract: The study was aimed to determine the efficacy of platelet rich fibrin (PRF), Ozonated olive oil and BlueM Gel application on early wound healing following gingivectomy/gingivoplasty procedures. Method and materials: In this split-mouth study gingivectomy/gingivoplasty procedures performed on 5 patients. The postoperative PRF, Ozonated olive oil and BlueM gel applied areas were compared with control group. The clinical parameters were measured such as: plaque index, gingival index, periodontal probing depth and bleeding on probing at baseline, after IPT & 30 day. The healing of wound determined with H₂O₂ test, VAS score for pain & LTH index on days 0, 7, 14 & 28th days. Results: On intragroup comparison of PI, GI, PPD, BOP on group1, group2, group3 & group4 shows significant differences in all the four groups at baseline, after IPT and day 30. But on intergroup comparison shows non-significant differences among the four groups at different time intervals; Whereas, VAS, LTH and H₂O₂ showed significant differences on group1 and group3 showed better results on postoperative days 8, 15 & 30. Conclusion: PRF releases various growth factors and not causes any side effects. Other side ozonated olive oil has antioxidant properties as well as accelerates wound healing, reduced postoperative pain and faster wound healing.

Keywords: Gingivectomy/gingivoplasty, Platelet rich fibrin, BlueM Gel, Ozonated olive oil

Introduction: Gingival enlargement or gingival overgrowth means increase the size of the gingiva. It is a common clinical finding, which is occurring due to variety of etiological factors such as plaque on tooth surface, gingival inflammation, mouth breathing, usage of certain drugs, neoplastic conditions and some systemic conditions such as (Pregnancy, Puberty); In such instances will perform gingivectomy/gingivoplasty procedures.¹ So, gingivectomy is a procedure which is used to remove the diseased gingiva or hyperplasia of the gingiva to establish normal gingival anatomy and

improve aesthetics. And, the gingivoplasty is a reshaping of gingiva. Robicsek (1884) and later Zentler (1918) described the gingivectomy procedure in the following way. After gingivectomy / gingivoplasty open surgical wounds requires periodontal dressing to protect the surgical sites for 1 week, that heals by secondary intention. It takes almost 6 weeks for the epithelization to be completed and approximately 7 weeks for connective tissue maturation. That is why using some materials for rapid healing after gingivectomy / gingivoplasty procedures, they are such as-Platelet rich-fibrin (PRF), BlueM Gel & Ozonated Olive Oil.^{2,3}

Platelet-rich fibrin (PRF) is a second-generation autologous platelet concentrates. It was first established by Joseph Choukroun et al. in (2001) in France. No bovine thrombin or external anticoagulants are used, they are simple and cost-effective are significantly lower than platelet-rich plasma (PRP). Single spin technique of centrifugation in which the tube is centrifuged at

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3000rpm for 10min. slow & natural polymerization occurs, when contact with the glass particles of the test tube. It is used in procedures like sinus lifting, management of furcation defects and periodontal intrabony defects. PRF also used to promote wound healing, stabilization of graft and hemostasis; Also it contains proteins, highly released growth factors and other bioactive molecules that stimulate cell growth adhesion and differentiation. 3-D fibrin matrix gives greater elasticity to the fibrin matrix, which are flexible, elastic & very strong PRF membrane.^{4,5,9}

Ozonated Olive Oil: Pure olive oil or Ozonated olive oil is basically an olive based fruit juice, ozonized by an constant flow of an oxygen to ozone combination at a ratio<of 5:95% until it changes from a greenish liquid to a whitish gel. It is made the help of high quality extravirgin and cold pressed olive oil, undergone through a process of „ozone injection“. The main benefits & key properties of ozonated oils are- It acts as a astringent, surface disinfectant, promotes angiogenesis by its antibacterial and antifungal action, Also it plays an important antioxidant properties.^{6,9}

BlueM Gel: A team of dental surgeons by Dr. Peter Blijdorp in Netherlands recently developed an active oxygen formula (BlueM gel) derived from honey, xylitol & lactoferrin which releases the oxygen at a therapeutic concentration in the affected tissues (Eisenbud, 2012). It improves the healing of wound by reducing bleeding gum, periodontitis or periimplantitis, radiation therapy or false teeth, implantation etc, and which may stimulates rapid reepithelization.^{7,8,9}

Material and methods: Among the patients reporting to the OPD in the Department of Periodontology, Kanti Devi Dental College & Hospital, Mathura (UP).

Inclusion Criteria

- Systemically healthy individuals, ages between 18-50 years with chronic inflammatory gingival enlargement.
- Bilateral maxillary and mandibular anterior region, enlargement without bone and attachment loss in clinical and radiographic

evaluation with adequate oral hygiene.

Exclusion Criteria

- Patients using drugs that may cause gingival enlargement.
- Patients with systemic diseases as diabetes, bleeding disorders.
- Pregnant and lactating females.
- Smokers and tobacco chewers.
- Patients receiving periodontal therapy in the last 6 months.

Study Design & Sample Size: In this randomized controlled split mouth (mandibular and maxillary right and left anterior regions) clinical study 40 surgical sites with chronic inflammatory gingival overgrowth were selected for gingivectomy & gingivoplasty and divided into four groups (10 surgical sites each group):

ii. Control and Test Groups:

Test Group

Group-1: Ozonated olive oil application after gingivectomy/gingivoplasty
Group-2: PRF application after gingivectomy/gingivoplasty
Group-3: Blue-M gel application after gingivectomy/gingivoplasty

Control Group

Group-4: Coe-pack application after gingivectomy/gingivoplasty procedures.

Measurement of Clinical Parameters:

- All preoperative and postoperative clinical parameters will be taken on baseline, after IPT, 8th day (T1), 15th day (T2) & 30th day (T3).
- Each patient's medical history were taken, and systemic diseases were assessed.

The clinical periodontal parameters:

I. Preoperative: Probing pocket depth (PPD) was measured from the gingival margin to the base of the periodontal pocket. A standard UNC-15 probe will be used for measuring the periodontal parameters.

- Plaque Index (Silness & Loe) [Baseline, after IPT]
- Gingival Index (Loe & Silness) [Baseline, after IPT]
- Bleeding on Probing [Baseline, after IPT]

II. Postoperative [8th (T1), 15th (T2) & 30th day (T3)]

- Healing Index (Landry Healing Index)
- Visual Analog Scale (VAS)
- Epithelialization test- H₂O₂ Test

III. Other Clinical Parameters

- Probing depth [30th day (T3)] along with use of UNC-15 probe to measure pocket depth
- Plaque Index (Silness & Loe) [30th day(T3)]
- Gingival Index (Loe & Silness) [30th day(T3)]
- Bleeding on Probing [30th day(T3)]

Pre-surgical Protocols: Following an initial examination and treatment planning discussion, all the selected patients were given detailed instructions regarding plaque control measures and then subjected to full mouth scaling and curettage were performed. All sites were subjected to record the clinical and radiographic parameters.

Clinical Follow-up of Patients: After gingivectomy and gingivoplasty procedures, patients were clinically recalled for control on days 8(T1), 15(T2) & 30(T3). Clinical controls of all patients were performed and evaluated parameters were respectively,:

- Evaluation of pain and esthetics
- Landry, Turbull and Howley (LTH) Index (To evaluate soft tissue healing)
- H₂O₂ foaming test

Postoperative care and suggestion: Patients were

Results: Table:1 Intergroup comparisons of VAS among the groups at different time durations

| Postoperative Day | PRF, mean \pm SD (median) | BlueM Gel, mean \pm SD (median) | OOO, mean \pm SD (median) | Control Group, mean \pm SD (median) | P Value |
|-------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------------|---------|
| 8th Day | 3.30 \pm 0.67 | 2.60 \pm 0.70 | 3.20 \pm 0.29 | 2.60 \pm 0.68 | 0.181 |
| 15th Day | 1.40 \pm 0.52 | 1.50 \pm 0.53 | 1.60 \pm 0.70 | 1.10 \pm 0.32 | 0.897 |
| 30th Day | 0.00 \pm 0.00 | 0.00 \pm 0.00 | 0.00 \pm 0.00 | 0.00 \pm 0.00 | 1.000 |

Statistical Analysis: Kruskal-Wallis (K-W) test. Statistically significant if P<0.05.

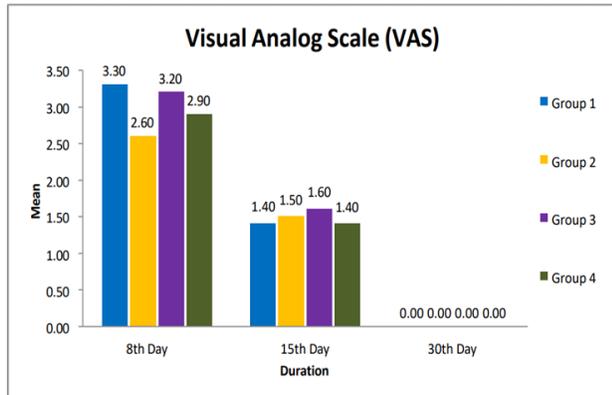
Table:2 Inter group comparisons of Landry healing index among the groups at different time durations

| Postoperative Day | PRF (mean \pm SD, median) | BlueM Gel (mean \pm SD, median) | OOO (mean \pm SD, median) | Control Group (mean \pm SD, median) | P Value |
|-------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------------|---------|
| 8th Day | 3.70 \pm 0.67 | 4.00 \pm 0.82 | 3.80 \pm 0.63 | 3.60 \pm 0.52 | 0.656 |
| 15th Day | 4.60 \pm 0.52 | 4.70 \pm 0.48 | 4.60 \pm 0.52 | 4.60 \pm 0.52 | 0.958 |
| 30th Day | 5.00 \pm 0.00 | 5.00 \pm 0.00 | 5.00 \pm 0.00 | 5.00 \pm 0.00 | 1.000 |

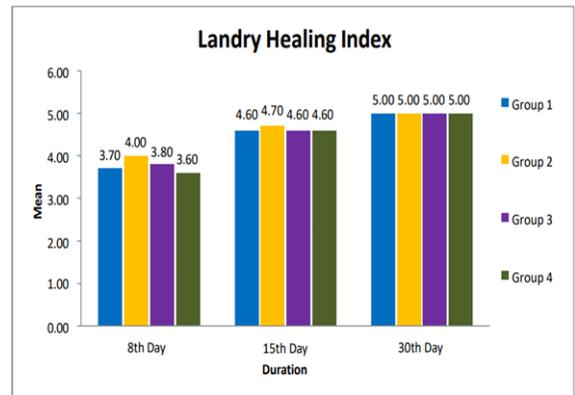
Statistical Analysis: Kruskal-Wallis (K-W) test. Statistically significant if P<0.05

advised to eat soft food and not to consume too hot and too cold food, to protect the wound area with periodontal dressing from trauma. It was explained that the periodontal dressing should be kept in the mouth for 1 week. Patients were prescribed an analgesic containing paracetamol and mouthwash containing 0.12 % chlorhexidine to use twice times a day for 1 week. Patients were advised not to brush their teeth in the operative region for 1 week. Patients were advised to use an extra-soft toothbrush in the area after the periodontal dressing was removed.

Statistical Analysis: SPSS Statistics 22 (IBM) program will be used in this study after evaluating the findings which will be obtained. The Kruskal-Wallis test will be used for intergroup comparisons of parameters that did not show normal distribution, ANOVA on repeated measures and Paired t test will be performed to determine the period that caused the difference. In intra-group comparisons of parameters that did not show a normal distribution, the Friedman test will be used, and the Wilcoxon sign test will be used to determine the period that caused the difference. The Fisher exact test and chi-square test will be used to compare qualitative data. P<.05 was considered as the significance level.



Graph 1: Comparisons of mean reductions of VAS among the groups at different durations



Graph 2: Comparisons of mean reductions of Landry healing index among the groups at different durations

Table:3 Inter group comparison of H2O2 test between the groups at different time duration

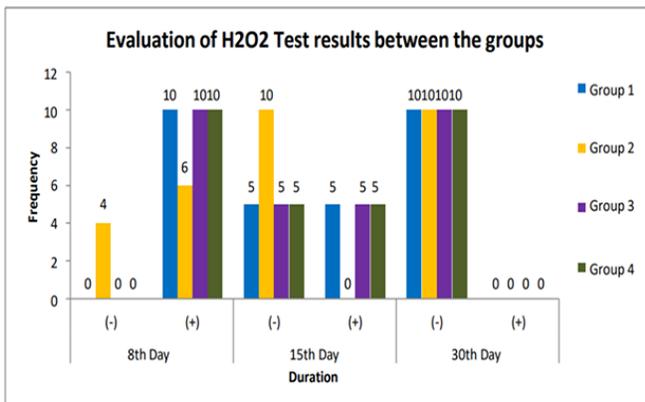
| Time | H ₂ O ₂ Test | Group 1 n(%) | Group 2 n(%) | Group 3 n(%) | Group 4 n(%) | Chi-square value | P value |
|--------------------|------------------------------------|--------------|--------------|--------------|--------------|------------------|----------|
| Baseline (8th Day) | (-) | 0 (0.0) | 4 (40.0) | 0 (0.0) | 0 (0.0) | 13.333 | 0.004 S |
| | (+) | 10 (100.0) | 6 (60.0) | 10 (100.0) | 10 (100.0) | | |
| 15th Day | (-) | 5 (50.0) | 10 (100.0) | 5 (50.0) | 5 (50.0) | 8.000 | 0.046 S |
| | (+) | 5 (50.0) | 0 (0.0) | 5 (50.0) | 5 (50.0) | | |
| 30th Day | (-) | 10 (100.0) | 10 (100.0) | 10 (100.0) | 10 (100.0) | 0.000 | 1.000 NS |
| | (+) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | | |

Statistical analysis: Chi-square test. Statistically significant if $P < 0.05$.

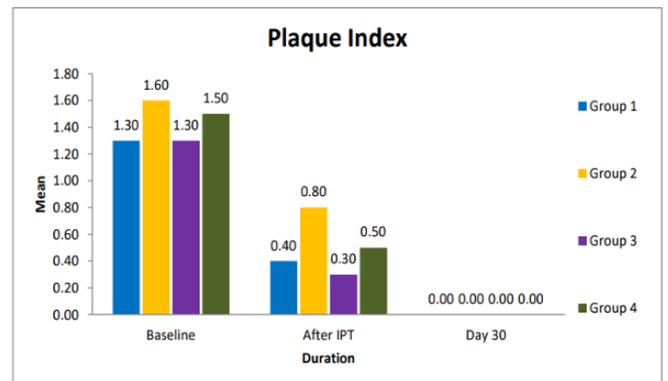
Table:4 Intergroup comparisons of plaque index among the groups at different time durations

| Postoperative Day | PRF (mean ± SD, median) | BlueM Gel (mean ± SD, median) | OOO (mean ± SD, median) | Control Group (mean ± SD, median) | P Value |
|-------------------|-------------------------|-------------------------------|-------------------------|-----------------------------------|---------|
| 8th Day | 1.30 ± 0.48 | 1.60 ± 0.70 | 1.30 ± 0.48 | 1.50 ± 0.53 | 0.597 |
| 15th Day | 0.40 ± 0.52 | 0.80 ± 0.63 | 0.30 ± 0.48 | 0.50 ± 0.53 | 0.256 |
| 30th Day | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.000 |

Statistical Analysis: Kruskal-Wallis (K-W) test. Statistically significant if $P < 0.05$



Graph 3: Comparisons of mean reductions of H2O2 test among the groups at different durations



Graph 4: Comparisons of mean reductions of Plaque Index among the groups at different durations

Table:5 Intergroup comparisons of gingival index among the groups at different time durations

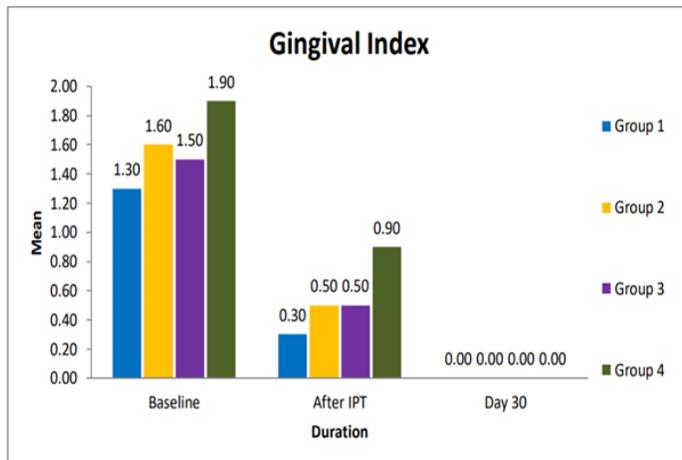
| Postoperative Day | PRF (mean ± SD, median) | BlueM Gel (mean ± SD, median) | OOO (mean ± SD, median) | Control Group (mean ± SD, median) | P Value |
|-------------------|-------------------------|-------------------------------|-------------------------|-----------------------------------|---------|
| Baseline | 1.30 ± 0.48 | 1.60 ± 0.70 | 1.50 ± 0.53 | 1.90 ± 0.74 | 0.249 |
| After IPT | 0.30 ± 0.48 | 0.50 ± 0.53 | 0.50 ± 0.53 | 0.90 ± 0.74 | 0.222 |
| Day 30 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.000 |

Statistical Analysis: Kruskal-Wallis (K-W) test. Statically significant if P<0.05

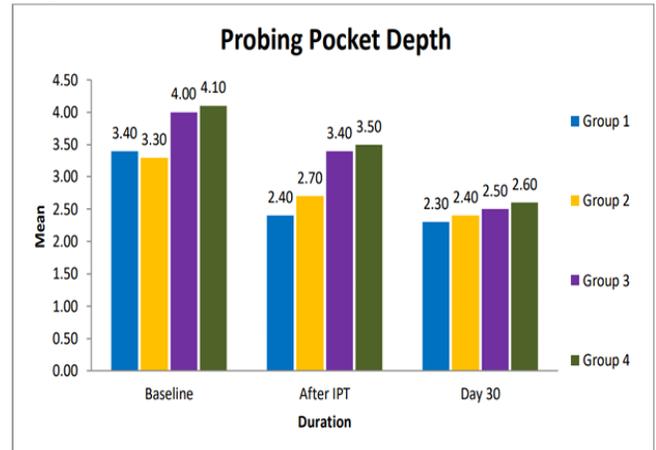
Table:6 Intergroup comparisons of probing pocket depth among the groups at different time durations

| Postoperative Day | PRF.mean+ SD (median) | BlueM Gel, mean+ SD (median) | OOO.mean+ SD (median) | Control Group.mean+ SD (median) | P Value |
|-------------------|-----------------------|------------------------------|-----------------------|---------------------------------|---------|
| Baseline | 3.40 ± 1.07 | 3.30 ± 1.06 | 4.00 ± 1.05 | 4.10 ± 0.88 | 0.219 |
| After IPT | 2.40 ± 0.52 | 2.70 ± 0.67 | 3.40 ± 0.84 | 3.50 ± 0.53 | 0.003 |
| Day 30 | 2.30 ± 0.48 | 2.40 ± 0.52 | 2.50 ± 0.53 | 2.60 ± 0.52 | 1.579 |

Statistical Analysis: Kruskal-Wallis (K-W) test. Statically significant if P<0.05



Graph 5: Comparisons of mean reductions of Gingival Index among the groups at different durations



Graph 6: Comparisons of mean reductions of Probing Pocket Depth among the groups at different durations

Table:7 Intergroup comparisons of bleeding on probing among the groups at different time durations

| Postoperative Day | PRF.mean+ SD (median) | BlueM Gel, mean+ SD (median) | OOO.mean+ SD (median) | Control Group.mean+ SD (median) | P Value |
|-------------------|-----------------------|------------------------------|-----------------------|---------------------------------|---------|
| Baseline | 1.90 ± 0.74 | 1.70 ± 0.67 | 1.60 ± 0.70 | 1.80 ± 0.79 | 0.806 |
| After IPT | 0.80 ± 0.63 | 0.70 ± 0.67 | 0.50 ± 0.53 | 0.80 ± 0.79 | 0.745 |
| Day 30 | 2.30 ± 0.48 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.000 |

Statistical Analysis: Kruskal-Wallis (K-W) test. Statically significant if P<0.05

Case Pictures:



Figure 1: Preoperative view (at baseline)



Figure 2: Measurement of probing depth with UNC15 probe in maxillary anteriors (at baseline)



Figure 3: Measurement of probing depth with UNC15 probe in mandibular anteriors (at baseline)



Figure 4: Measurement of Probing depth with UNC15 probe on Upper and lower anteriors (After IPT)



Figure 5: Bleeding point marked with pocket marker in maxillary & mandibular anteriors (After IPT)





Figure 6: External bevel incision on Maxillary & Mandibular anterior region (After IPT)



Figure 7: Removal of excised tissue (After IPT)



Figure 8: BlueMGel & PRF application lower on right & left side (After IPT)



Figure 9: Ozonated olive oil application on upper left side (After IPT)



Figure 10: Coepak application on maxillary & mandibular anterior region



Figure 11: Evaluation of epithelialization by H₂O₂ test (on 8th Days)



Figure 12: Evaluation of epithelialization by H₂O₂ foaming test (On 15th Days)



Figure:13 Measurement of probing depth with UNC15 probe (at 30th day)

Discussion

Surgical removal of the enlarged gingiva using conventional scalpel technique which is one of the earlier techniques and is still considered as gold standard. Scalpel surgery can cause bleeding during and after the procedure, discomfort caused by the open surgical wound requires a periodontal dressing to protect the surgical sites for 7 to 10 days and that heals by secondary intention. Since healing of wound is a dynamic and intricate process, so numerous applications are made to promote wound healing after gingivectomy & gingivoplasty, it is seen that many different applications are performed to contribute positively to wound healing. Studies on the determination of product and method to provide the most ideal wound healing.

PRF is a 3 dimensional biodegradable polymer. The benefits of inexpensive, simple to use platelet concentrates on healing of wound, because they are entirely autogenous, won't result in any side effects or resistance development were investigated. For an extended length of time, the PRF matrix can also release various growth factors & cytokines, locally at the wound site.

The novel dental product BlueM Gel may release oxygen during wound healing enhancing oxidative killing, stimulating angiogenesis, accelerating the formation of extracellular matrix, increased fibroblasts proliferation, collagen deposition and promoting faster healing. The anaerobic bacteria

linked to periodontitis are eliminated by Blue M gel's highly released oxygen, which aids in the restoration of a healthy dental flora. Blue M gel has anti-infective, anti-inflammatory action, bactericidal properties due to its slow releasing oxygen product, which also stops the building of the biofilms that cause oral infections.

The use of ozonated olive oil, in dentistry is founded on its physical and chemical characteristics including its detoxicating, immunostimulatory action, antihypoxic, biosynthetic, and antibacterial effects. Because it is a more potent antibiotic, Ozone gas is a highly reactive and unstable gaseous molecule, is used as an oral antiseptic. Ozone and the unsaturated fatty acids in vegetable oils react chemically to produce ozonated oils. Pregnancy, glucose-6-phosphate- dehydrogenase deficiency, hyperthyroidism, anemia, severe myasthenia, and active bleeding should be contraindicated when using ozone therapy.

M Addy, A E Dolby concluded that the use of chlorhexidine mouthwash compared with periodontal dressing provide better healing and reduction of postoperative pain and plaque scores.¹⁰ Amorim Faria C J et al. concluded that the use of low level laser therapy (LLLT) after surgery equally effective for reduction of plaque scores, which promotes better wound healing, reduction of postoperative pain and patient discomfort on postoperative 3, 7, 14, 25 and 35 days.¹¹

Pilloni *et al.* applied IPT to 10 patients with gingival enlargement, then divided the patients into two groups and performed flap surgery on five patients and gingivectomy on five patients. They reported a significant decrease in PI, GI & PD scores in the sixth postoperative week.¹² Lione *et al.* divided 60 patients with gingival overgrowth during orthodontic treatment into three groups after IPT while no procedure was applied to the control group after IPT and they performed conventional gingivectomy and laser gingivectomy to the test groups. Both conventional and laser gingivectomy are equally effective in reducing PI, GI, and PD at 1, 3 and 6 months postoperatively. In the present study determined that were significantly decrease in PI, GI, PD & BoP scores after gingivectomy and gingivoplasty, and have a positive effect on clinical periodontal parameters.¹³ Significant differences among four groups at postoperative days 8th, 15th & 30th. Similarly on intergroup comparison of group 1 vs group 3, group 1 vs group 4 and group 2 vs group 4 showed significant differences between the four groups at different time intervals; group 2 & group 3 showed less postoperative pain on the postoperative days 8th, 15th & 30th. Sobouti *et al.* was observed VAS pain score was 5.42 at 7 days after gingivectomy using a scalpel.¹⁴ In the present study on day 8, the mean VAS score was 3.30. So the use of platelet concentrate after gingivectomy, it provides better wound healing and reduce the postoperative pain and better patient comfort. Ozturan *et al.* observed the esthetics satisfaction of patients with VAS on 12 months after laser gingivectomy found a mean value was 92.7. In the present study the mean VAS score value in the control group on day 30 was 0.00.¹⁵

The mean reduction of wound healing score was statistically significant in all the four groups on postoperative 8th, 15th and 30th days. However on intergroup comparison of healing index at postoperative days 8, 15 & 30 showed non-significant differences between the four groups at different time intervals. Debnath and chatterjee reported in their study in 2018 that application of PRF and PRF matrix on wound surfaces after

depigmentation accelerated wound healing and increased patient comfort.¹⁶ On the other hand, Bansal *et al.* evaluated the effect of PRF application on wound healing after depigmentation clinically and histologically, and as a result of the study, they showed that PRF application after depigmentation shortened the recovery time and increased postoperative patient comfort.¹⁷ Sousa *et al.* showed that the application of advanced PRF (A-PRF) to the palatal donor area after FGG accelerates wound healing.¹⁸

On intergroup comparison of mean H2O2 scores of group 1, group 2, group 3 & group 4 on postoperative days 8th & 15th showed significant differences between the four groups at different time intervals; similarly on postoperative day 30 of group 1, group 2, group 3 & group 4 showed non-significant differences between the four groups. Ashraf T *et al.* concluded that the efficacy of sub gingival irrigation with 3% H2O2 are effective to control inflammation as well as decreased gingival bleeding, reduction in pocket depth and gain in relative attachment levels.¹⁹ Muniz Gomes Mustafa W F *et al.* concluded that the efficacy of oral rinsing with 1.5% H2O2 showed has a potential affect to control plaque, gingivitis and oral bacteria. In the recent study determined that on postoperative day 30 the epithelialization is to be completed, where foaming was not observed.²⁰

Conclusion: With the confines of this pilot study, the outcomes have indicated that gingival wound healing may be improved using conventional scalpel after gingivectomy and gingivoplasty operations.

On the analysis of all the above findings, it was concluded that the effect of PRF and ozonated olive oil showed better wound healing, reducing postoperative pain, better patient comfort and complete epithelialization was observed at the end of 30th day.

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Conflict of Interest: The author has no financial interest associated with materials used in this study

and declares no conflict of interest.

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Authors Contribution: This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

References

- Newman, M.G., Takei, H.H. and Carranza, F.A. (2002). *Clinical periodontology*. 9th ed. WB Saunders Co.
- Ramfjord, S.P. and Engler, S.P. (1966). A radiographic study of healing following simple gingivectomy. II. The connective tissue. *Journal of Periodontology*, 37: 179–189.
- Stahl, S.S. and Witkin, G. (1968). *Gingival healing II. Clinical and histologic repair sequences following gingivectomy*. *Journal of Periodontology*, 39: 109–118.
- Borie, E., Oliví, D.G., Orsi, I.A., Garlet, K., Weber, B., Beltrán, V. and Fuentes, R. (2015). *Platelet-rich fibrin application in dentistry: A literature review*. *International Journal of Clinical and Experimental Medicine*, 8(5): 7922–7929.
- Dohan, D.M., Choukroun, J., Diss, A., Dohan, S.L., Dohan, A.J., Mouhyi, J. and Gogly, B. (2006). *Platelet-rich fibrin (PRF): A second-generation platelet concentrate. Part I: Technological concepts and evolution*. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 101(3): e37–e44.
- Anzolin, A.P., Silveira-Kaross, N.L. and Bertol, C.D. (2020). *Ozonated oil in wound healing: What has already been proven?* *Medical Gas Research*, 10(1): 54–59.
- Garg, U., Kaur, N. and Kaur, G. (2024). *Comparative evaluation of oxygenating agent “blue m gel” and traditional periodontal dressing “Coe-Pak” on patient preference parameters (pain and wound healing) after surgical depigmentation – A split-mouth study*. *IP International Journal of Periodontology and Implantology*, 9(1): 31–37.
- Eisenbud, D.E. (2012). *Oxygen in wound healing: Nutrient, antibiotic, signaling molecule, and therapeutic agent*. *Clinics in Plastic Surgery*, 39(3): 293–310.
- Bozkurt, E. and Uslu, M.O. (2022). *Evaluation of the effects of platelet-rich fibrin, concentrated growth factors, and autologous fibrin glue application on wound healing following gingivectomy and gingivoplasty operations: A randomized controlled clinical trial*. *Quintessence International*, 53(4): 328–341.
- Addy, M. and Dolby, A.E. (1976). *The use of chlorhexidine mouthwash compared with a periodontal dressing following the gingivectomy procedure*. *Journal of Clinical Periodontology*, March: [provide page numbers, ISSN: 1600-051X].
- Amorim Faria, C.J. et al. (2016). *Effect of low-level laser therapy on wound healing after depigmentation procedure: A clinical study*. *Journal of Indian Society of Periodontology*, 20(2): 184–188.
- Pilloni, A., Camargo, P.M., Carere, M. and Carranza, F.A. Jr. (1998). *Surgical treatment of cyclosporine A and nifedipine induced gingival enlargement: Gingivectomy vs periodontal flap*. *Journal of Periodontology*, 69: 791–797.
- Lione, R., Pavoni, C., Noviello, A. et al. (2020). *Conventional versus laser gingivectomy in the management of gingival enlargement during orthodontic treatment: A randomized controlled trial*. *European Journal of Orthodontics*, 42: 78–85.
- Sobouti, F., Rakshan, V., Chiniforush, N. et al. (2014). *Effects of laser-assisted cosmetic smile lift gingivectomy on postoperative bleeding and pain in fixed orthodontic patients: A controlled clinical trial*. *Progress in Orthodontics*, 15: 66.
- Ozturan, S., Aye, S. and Sagir, S. (2014). *Case series of laser-assisted treatment of excessive gingival display: An alternative treatment*. *Photomedicine and Laser Surgery*, 32: 517–523.
- Debnath, K. and Chatterjee, A. (2018). *Clinical and histological evaluation on application of platelet concentrates on depigmented gingival*

- epithelium*. Journal of Indian Society of Periodontology, 22(2): 150–157.
17. Bansal, M., Kumar, A., Puri, K., Khatri, M., Gupta, G. and Vij, H. (2016). *Clinical and histologic evaluation of platelet-rich fibrin accelerated epithelization of gingival wound*. Journal of Cutaneous and Aesthetic Surgery, 9(3): 196–200.
 18. Sousa, F., Mechado, V., Botelho, J., Mendes, J.J. and Alves, R. (2020). *Effect of A-PRF application on palatal wound healing after free gingival graft harvesting: A prospective randomised study*. European Journal of Dentistry, 14: 63–69.
 19. Ashraf, T., Jan, S. and Kumar, A. et al. (2019). *Role of hydrogen peroxide as a subgingival irrigant in periodontal therapy*. International Journal of Research and Review, 6(3): 33–36.
 20. Mustafa, W.F.M.G., Cavagni, J., Langa, J.P.G., Stewart, B. et al. (2020). *A systematic review of the effect of oral rinsing with H₂O₂ on clinical and microbiological parameters related to plaque, gingivitis, and microbes*. International Journal of Dentistry, Article ID 8841722.