



ORIGINAL ARTICLE

Effect of periodontal dressing on the clinical outcomes of non-surgical periodontal treatments; A randomized controlled trial.

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ABSTRACT... Objective: To study the effectiveness of periodontal dressing on different clinical periodontal parameters after scaling and root planning. **Study Design:** Randomized Controlled Trial. **Setting:** Department of Periodontology, Multan Medical & Dental College, Multan. **Period:** May to July 2020. **Material & Methods:** Thirty three patients of both genders between ages 30-60 were included. Five clinical parameters were measured at baseline. These variables were recorded by University Of Michigan “O” Probe with William’s Markings. The measurements were executed by a single, trained and calibrated examiner. Right and left quadrants of Maxilla and Mandible of the same patient were selected as the test and control sites respectively through random selection by lottery method. The maxillary and mandibular test sides were covered with periodontal dressing for 07 days, later the dressing was detached. After 12 weeks, all clinical parameters were recorded again by the same examiner. **Results:** Mean age was found to be 45.28 years in males and 41.27 years in females. The mean Kappa value of intra-examiner reliability was identified as 0.95. In comparison to control group, test group showed a highly significant improvement in all five tested periodontal variables when the values were compared at base line and then after 12 weeks. **Conclusion:** Periodontal dressing has significantly improved the clinical outcomes and the periodontal parameters after Scaling and Root Planning procedures.

Key words: Non-surgical Periodontal Treatment, Periodontal Dressing, Perio-pack, Scaling and Root Planning.

INTRODUCTION

The undisturbed presence of plaque and establishment of bacterial colonies lead to gingival and periodontal inflammation which adversely effects periodontal ligament.¹⁻² Bacteria within it are the known culprits for the periodontal disease and develops a natural disruption between different microorganisms, host responses and some essential modifying factors.³ Lesions in the periodontal tissues are clinically identified and diagnosed based on the presence of bleeding on probing (BOP), Probing pocket depth (PPD), Gingival recession (GRec) and after sometime an increased tooth mobility.⁴⁻⁵

Surgical and non-surgical procedures are performed to arrest the periodontal disease progression, prevents its recurrence and

regeneration of lost periodontium.⁶ Non-Surgical therapies include Scaling and Root Planning (SRP) which reduces the inflammation, infection and creates an environment, which is conducive to periodontal health and amenable to regeneration.⁷⁻¹⁰ Due to Scaling and Root Planning a possible local trauma may generate in the periodontal area. Healing of these areas actually leads to the formation of long junctional epithelium rather than a new connective tissue attachment.¹¹ Also the repairing of this healed gingiva may result in remarkable decrease of swelling which as a consequence leads to recession at the margins due to inflammation resolution.¹²

In the early 19th century periodontal dressing was introduced to protect periodontal wounds.¹³

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These dressings provide protection and remain in close contact with the tissue and the tooth, which helps coagulum stabilization and protection from external and internal applicable forces during function.^{12,14} In order to improve tissue health and reduce patient discomfort periodontal dressing was used. It is also reported that surgical curettage produces a disruption which causes separation of the lingual and buccal tissues.¹⁵ As the procedure is completed, the marginal gingiva and interdental papilla must be re-approximated with the tooth, either by sling sutures or by a stiff dressing.^{16,17} This dressing inhibits blood oozing and prevents mechanical trauma throughout the phases of healing.^{18,19} It was observed in the previous studies that when such wound areas were covered with packs of periodontal dressing for 3 to 4 days the procedure with sutures, impaction of food debris in proximal spaces is prevented.²⁰ In a nut shell, during mastication and speech the coagulum is protected by the presence of periodontal dressing by preventing its dislodgement from the tooth / root surface.²¹⁻²³

Many studies from different parts of the world are now recommending the use of periodontal dressing for the clinical improvements in different levels of gingival attachment, measurements of pocket depth and bleeding in the course of probing. However, in our part of the world there is not enough data supporting this fact. Therefore, this study was planned with an objective to study the effectiveness of periodontal dressing on different clinical periodontal parameters after scaling and root planning.

MATERIAL & METHODS

This Single Blind, Split Mouth, Randomized Controlled Trial was conducted over a period of 03 months (May to July 2020) and included 33 patients. The trial was carried out in the Department of Periodontology, Dental Section, Multan Medical & Dental College, Multan. Permission to conduct this study was attained from Institutional Review Board & Ethical Committee of the same institution (IRB/MDC/-003).

Through non-probability purposive sampling, patients of both genders between age 30-60,

having minimum of 12 teeth (at least three teeth per quadrant), and those patients which were not treated before for chronic periodontitis were selected in this study. The inclusion criteria was also based upon that these selected patients must have either equal or greater than 6mm pocket depth and bleeding on dental probing in any tooth in all four quadrants. However, participants who were smokers, with any systemic disease, pregnant, having prosthesis and over hanged restorations were excluded from the study. The patients were explained about the nature of the study and were requested to sign the informed consent.

Five clinical parameters (test variables) were measured at baseline and then after 3 months. These variables were recorded by University Of Michigan "O" Probe with William's Markings. The measurements were executed by a single, trained and calibrated examiner. The parameters tested in this study were:

1. The Periodontal/Probing Pocket Depth (PPD), which was recorded by taking measurements from free gingival margin (FGM) to the base of the pocket at 06 sites of each tooth, facial, disto-facial, mesio-facial, disto-lingual, lingual and mesio-lingual.
2. The Clinical Attachment Level (CAL) was measured in millimeters from Cemento Enamel Junction (CEJ) to the base of the pockets.
3. The extent of gingival recession (GRec) was measured with the closest to 0.5 mm at the same sites as the periodontal pocket depth.
4. Bleeding Index (BI) was measured using a periodontal probe at 30 seconds the probe is inserted at four sites (mesial, distal, buccal and lingual) for measurement and the score ranges from 0 (no bleeding) to 1 (bleeding).
5. The Plaque Score (PS) was observed with the naked eye and with the help of the probe at 04 different sites per tooth (mesial, distal, buccal and lingual). Silness and Loe Plaque Index was employed and accordingly the scores ranged from 0 (absent) to 1-3 (present).

After the baseline periodontal examination patients were demonstrated and advised to

perform home care procedures in order to standardize all the patients and avoid bias. These procedures included brushing teeth with modified bass technique, inter dental flossing and tongue scraping in case of tongue coating. Scaling and root planning, using ultra sonic scaler and hand instruments were performed in two sessions within 24 hours and supplemented with rinses of anti-plaque agent that is chlorhexidine 0.2% solution for at least 1 min.

Split mouth section technique was used in which right and left quadrants of Maxilla and Mandible of the same patient were selected as the test and control sites respectively through random selection by lottery method. This was single blind trial as only the study participants were blind to this selection. Intra-examiner reliability for the five clinical parameters was accomplished on 10% of the total study subjects. The researcher / examiner mixed the periodontal dressing according to manufacturer's instructions and applied to all the test sites. The maxillary and mandibular test sites were wrapped with periodontal dressing for at least 07 days. The oral hygiene instructions were reinforced and patients were advised not to brush on perio-pack surface, as long as dressing is there. After 07 days, periodontal dressing was detached from test sides and previously given oral hygiene instructions were again reinforced. After 12 weeks, all clinical parameters (testing variables) were recorded by the researcher as it was done at baseline.

Data analysis was performed in SPSS version 20.0. Descriptive statistics were performed that involved the frequencies and percentages of age and gender. Student Paired t-test was employed to identify the mean difference between the measured five clinical parameters at base line and at 02 months. Intra-examiner reliability was calculated using Cohen's Kappa. The p-value of <0.05 was considered as statistically significant at the 95 % confidence level while the power of the test was kept at 80%.

RESULTS

A total of 57 patients were examined, out of which 33 patients with a diagnosis of chronic periodontitis were included. Among these 22 (64.7%) were males and 12 (35.3%) were females. All patients belonged to Asian race with average age of 45 years in males and 41 years in females. Intra-examiner reliability was calculated using Cohen's Kappa and was found to be 0.92.

Table-I illustrates the mean differences in the five chosen clinical parameters for both the groups (test and control sites) at baseline and after 12 weeks. In test group, a highly significant improvement was observed at post intervention as compare to pre-intervention relating to all five periodontal variables. The mean difference of control group was higher in pocket depth, clinical attachment loss, recession, full mouth bleeding and full mouth plaque as compare to test group. (Figure-1)

Test Group n=33	Pre-Intervention	Post-Intervention	Mean Difference	P-Values
	Mean ±SD	Mean ±SD		
Pocket Depth	10.88 ± 2.93	7.57 ± 2.38	3.130	<0.001*
Clinical Attachment Loss	8.33 ± 0.85	6.15 ± 0.72	2.180	<0.001*
Recession	7.41 ± 4.09	5.55 ± 3.54	1.858	0.05*
Full Mouth Bleeding	8.91 ± 2.16	5.48 ± 1.51	3.423	<0.001*
Full Mouth Plaque	9.22 ± 2.26	6.63 ± 1.53	2.590	<0.001*
Control Group n=33				
Pocket Depth	11.43 ± 3.07	10.18 ± 2.85	1.247	0.06
Clinical Attachment Loss	8.22 ± 4.97	7.10 ± 4.31	1.124	0.05
Recession	8.03 ± 3.55	7.58 ± 3.14	0.449	0.587
Full Mouth Bleeding	8.92 ± 2.12	7.11 ± 1.67	1.816	<0.001*
Full Mouth Plaque	9.24 ± 2.18	7.48 ± 7.91	1.759	0.222

Paired t-test test applied, *p-value ≤0.05

Table-I. Mean difference of periodontal treatment in test and control group before and after intervention

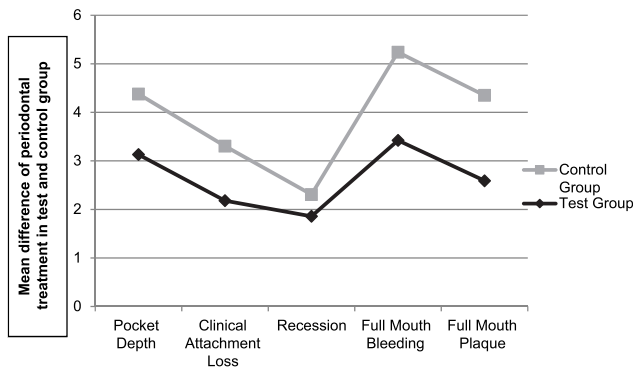


Figure-1. Mean difference of periodontal treatment in test versus control group with respect to five clinical parameters

DISCUSSION

This randomized control trial was conducted to compare the clinical outcomes of scaling and root planning alone and in combination with a periodontal dressing placed for 07 days. The present study has reported a statistically significant difference in the clinical parameters of test and control group when compared at base line and after 12 weeks.

During non-surgical periodontal treatment, dehiscence or a rupture is found in the gingiva especially at junctional epithelium, gingival sulcus and connective tissue results in formation of wounds. These wounds then heal by themselves because of physiologic tissue repair and hemostasis leading to blood clot formation and an overall decrease in swelling and inflammation. This response results in remarkable recession at marginal gingival and formation of long junctional epithelium at the healing site with increase in connective tissue. Accumulation of small amount of blood is visible in these sites due to the continuous unavoidable movement of cheeks and increased in amount of saliva when the periodontal dressing is applied to the wound site.²⁴

The present study selected the test and control groups/sites in same patient to conveniently and efficiently compare the clinical outcomes and the periodontal parameters in the given time frame. The current study identified a remarkable stabilization of gingiva and protection of blood clot

which ultimately supported in close adherence of gingiva to tooth surface. This whole process can be a possible reason of success in better clinical adaptation after scaling and root planing.²⁵

In the present trial, the test site pocket depth value at base line was 10.884 and after 12 weeks it became 7.576 showing a significant reduction of 3.130. Whereas, at the control site the base line pocket depth was 11.430 and after 12 weeks it was 10.183, resulting in non-significant reduction of 1.247. This revealed that pocket depth reduction at test site was almost double as compared to the control area.

Similar results were observed in a previous study done by Sigusch et al in 2005, in which the researcher applied the same periodontal dressing as an additional means in the treatment of patients with aggressive and destructive periodontitis.²⁶ These findings are also in line with another previous study by Keestra et al which reported a significant decline of the pocket depth of 1.20mm as compared to the base line.²⁴

Current study has demonstrated that when scaling and root planning procedures were performed and necrotic and fibrosed tissues are removed, re-attachment of the gingival connective tissue with the root had resulted in gain in clinical attachment and remarkable decreased in pocket depth and bleeding scores. Results of the current study concluded that clinical attachment loss in test site at base line was 8.335 and after 12 weeks it reduced to 6.155. However, on the control site values at the base line was 8.226 and after 12 weeks it changed to 7.100. This suggests that gingival tissue receiving periodontal dressing had gain the clinical attachment almost two times more than the gingival tissue which did not received the periodontal dressing. These results are comparable with a previous study done by Sigusch et al in which periodontal attachment level reduced from 6.7mm at base line to 3.5mm at 6 months interval and reduce further 0.2 mm after 24 months.²⁶

In another study done by Genovesi et al, the gain in attachment was improved in both sides,

however, better results were obtained on the test side ($2.5 \pm 0.4\text{mm}$) compared with the control side ($1.4 \pm 0.4\text{mm}$).²⁷ The results of the Keestra et al study showed that the test group had a much greater clinical attachment with 1.01mm .²⁴

In present trial, apart from pocket depth reduction and gain in clinical attachment, results of gingival recession were also significantly improved at test side. At base line it was 7.414 and after 12 weeks it reduced to 5.555 showing a significant difference (improvement) in gingival recession. These results are parallel to the study of Keestra et al studies in which the test group showed a significant increase of the gingival recession with 0.48mm compared to the base line and reported the adjusted p value of $p < 0.0001$.²⁴

Full mouth bleeding score in the current study was 8.91 at test site at base line and 5.484 at same site after 12 weeks. The difference was significant (3.423) between the two readings. Whereas, at control site the score was 8.924 which after 12 weeks reduced to 7.11 reporting a difference of 1.816. This represents that the bleeding score in test group (periodontal dressing side) had significantly less bleeding score than control group (non-periodontal dressing side). These results were similar to a previous study of Genovesi et al, which reported that values of the full mouth bleeding score were reduced after periodontal treatment.²⁷ Another study by Keestra et al showed that the mean values for BOP of control group is 39% ($p=0.001$) and for test group it was 51% ($p=0.0001$) when compared to their base line readings.²⁴

The mean difference for full mouth plaque scores at test site was 9.227 and after 12 weeks it was 6.636, suggesting a significant difference of 2.590 between the two scores. Similar plaque score of control side at base line was 9.243 and after 12 weeks it became 7.484, with a total difference of only 1.759. In comparison, Genovesi et al at base line reported almost 20% reduction in the plaque scores.²⁷ Similar results were also stated by Keestra et al in which test group had much greater reduction of 37% and the control group showed reduction of 11% ($p < 0.0001$), ultimately

reporting that plaque score had decreased by using the periodontal dressing.²⁴

Results of the present trial therefore suggest that after scaling and root planning, the periodontal dressing which was applied to stabilize the wound area created as a result of removing the necrotic tissue, has in turn stabilized the clot and improved the healing process. As a consequence, wound was not disturbed repeatedly leading to gingival tissue shrinkage and reduce bleeding on probing. Along with some re-growth of gingival tissues, reduction in probing depth, clinical attachment loss and gingival recession was also appreciated. Reduction in plaque scores have occurred because of scaling and root planning procedures, use of antibacterial effect of dressing (chlorothymol) on the particular area and instructions to maintain oral hygiene throughout the trial period.²⁸

CONCLUSION

Periodontal dressing has significantly improved the clinical outcomes and the periodontal parameters after scaling and root planning procedure.

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REFERENCES

1. Nanci A, Bosshardt DD. **Structure of periodontal tissues in health and disease.** Periodontology 2000. 2006; 40(1):11–28.
2. Curtis MA, Zenobia C, Darveau RP. **The relationship of the oral microbiota to periodontal health and disease.** Cell host & microbe. 2011 Oct 20; 10(4):302-6.
3. Archana PM, Salman AA, Kumar TS, Saraswathi PK, Panishankar KH, Kumarasamy P. **Association between interleukin-1 gene polymorphism and severity of chronic periodontitis in a south Indian population group.** Journal of Indian Society of Periodontology. 2012 Apr; 16(2):174.
4. Meyer-Baumer A, Pritsch M, Cosgarea R, El Sayed N, Kim TS, Eickholz P, Pretzl B. **Prognostic value of the periodontal risk assessment in patients with aggressive periodontitis.** Journal of clinical periodontology. 2012 Jul; 39(7):651-8.

5. Ghanbari H, Forouzanfar A, Fatemi K, Mokhtari M, Abrishami M, Ebrahimini Z, Farazi F. **Modified Widman flap procedure: With or without periodontal dressing.** Open Journal of Stomatology. 2012 Sep; 24; 2(3):170-2.
6. Kye W, Davidson R, Martin J, Engebretson S. **Current status of periodontal risk assessment.** Journal of Evidence Based Dental Practice. 2012 Sep 1; 12(3):2-11.
7. Soheilifar S, Bidgoli M, Faradmal J, Soheilifar S. **Effect of periodontal dressing on wound healing and patient satisfaction following periodontal flap surgery.** Journal of dentistry (Tehran, Iran). 2015 Feb; 12(2):151.
8. Pabolu CM, Mutthineni RB, Chintala S. **Evaluation of the effect of one stage versus two stage full mouth disinfection on C-reactive protein and leucocyte count in patients with chronic periodontitis.** Journal of Indian Society of Periodontology. 2013 Jul; 17(4):466.
9. Teughels W, Dekeyser C, Van Essche M, Quirynen M. **One-stage, full-mouth disinfection: Fiction or reality?** Periodontology 2000. 2009 Jun; 50(1):39-51.
10. Gutierrez-de la Garza IK, Martinez-Sandoval G, Rodriguez-Franco NI, Chapa-Arizpe MG, Israel J. **Full-mouth disinfection protocol: Applications, techniques and variables in non-surgical periodontal treatment literature review.** International Journal of Applied Dental Sciences. 2019; 5(3):25-29.
11. Bhudevamma S, Javali MA, Katti G. **A clinical and histopathological study of efficacy of chlorhexidine on gingival healing.** Indian Journal of Public Health Research & Development. 2012; 3(2):63-7.
12. Oliveira AM, Costa FO, Nogueira LM, Cortelli SC, Oliveira PA, Aquino DR, Miranda TB, Cortelli JR. **Azithromycin and full-mouth scaling for the treatment of generalized stage III and IV periodontitis: A 6 - month randomized comparative clinical trial.** Brazilian dental journal. 2019 Oct; 30(5):429-36.
13. Barrientos S, Stojadinovic O, Golinko MS, Brem H, Tomic-Canic M. **Growth factors and cytokines in wound healing.** Wound Repair and Regeneration. 2008; 16(5):585-601.
14. Singh MP, Saxena M, Saimbi CS, Siddiqui MH, Roy R. **Post-periodontal surgery propounds early repair salivary biomarkers by 1 H NMR based metabolomics.** Metabolomics. 2019 Nov 1; 15(11):141.
15. Abed AM, Yaghini J, Tavakoli M, Amjadi MR, Najafian E. **Evaluation of the effect of post-operative packing of gingiva on clinical signs and symptoms: A pilot study.** Journal of Isfahan Dental School. 2011; 6(5):705-11.
16. Martel DP, Fox PR, Lamb KE, Carmichael DT. **Comparison of closed root planning with versus without concurrent doxycycline hyclate or clindamycin hydrochloride gel application for the treatment of periodontal disease in dogs.** Journal of the American Veterinary Medical Association. 2019 Feb 1; 254(3):373-9.
17. Martins MR, Carvalho MF, Pina-Vaz I, Capelas JA, Martins MA, Gutknecht N. **Outcome of Er, Cr: YSGG laser-assisted treatment of teeth with apical periodontitis: A blind randomized clinical trial.** Photomedicine and laser surgery. 2014 Jan 1; 32(1):3-9.
18. Kathariya R, Jain H, Jadhav T. **To pack or not to pack: The current status of periodontal dressings.** Journal of applied biomaterials & functional materials. 2015 Jul; 13(2):73-86.
19. Rubinstein S, Levin BP, Fujiki T. **Surgical and prosthetic management of implants: Single and Full- Arch Reconstruction.** Compendium of continuing education in dentistry (Jamesburg, NJ: 1995). 2015; 36(7):504-7.
20. ZenginCelik T, Saglam E, Ercan C, Akbas F, Nazaroglu K, Tunali M. **Clinical and microbiological effects of the use of erbium: Yttrium-aluminum-garnet laser on chronic periodontitis in addition to nonsurgical periodontal treatment: A randomized clinical trial—6 months follow-Up.** Photobiomodulation, photomedicine, and laser surgery. 2019 Mar 1; 37(3):182-90.
21. Liu C, Qi X, Alhabeil J, Lu H, Zhou Z. **Activation of cannabinoid receptors promotes periodontal cell adhesion and migration.** Journal of clinical periodontology. 2019 Dec; 46(12):1264-72.
22. Soheilifar S, Bidgoli M, Faradmal J, Soheilifar S. **Effect of periodontal dressing on wound healing and patient satisfaction following periodontal flap surgery.** Journal of dentistry (Tehran, Iran). 2015 Feb; 12(2):151.
23. da Silva MD, dos Santos Menezes K, Simoes TM, Neto JD, Batista AL, de VasconcelosCatao MH. **Evaluation of the adjuvant effect of antimicrobial photodynamic therapy in the treatment of periodontal disease: Literature review.** Journal of Health Sciences. 2019 Sep 24; 21(3):274-80.
24. Keestra JA, Coucke W, Quirynen M. **One-stage full-mouth disinfection combined with a periodontal dressing: A randomized controlled clinical trial.** Journal of clinical periodontology. 2014; 41(2):157-63.

25. Meghana MV, Deshmukh J, Devarathanamma MV, Asif K, Jyothi L, Sindhura H. **Comparison of effect of curcumin gel and noneugenol periodontal dressing in tissue response, early wound healing, and pain assessment following periodontal flap surgery in chronic periodontitis patients.** Journal of Indian Society of Periodontology. 2020 Jan 1; 24(1):54.
26. Sigusch B, Pfitzner A, Nietzsche T, Glockmann E. **Periodontal dressing Vocopac influences outcomes in a two-step treatment procedure.** Journal of clinical periodontology. 2005; 32(4):401–5.
27. Genovesi A M, Ricci M, Marchisio O, Covani U. **Periodontal dressing may influence the clinical outcome of non-surgical periodontal treatment: A split-mouth study.** Int J Dent Hygiene. 2012; 10: 284–89.
28. Baghani Z, Kadkhodazadeh M. **Periodontal dressing: A review article.** Journal of dental research, dental clinics, dental prospects. 2013; 7(4):183.

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2	Aeeza Malik	Basic conception, designing, data collection, and write-up.	
3	Malik Saleem Shaukat	Basic conception, designing, write-up.	
4	Basil Khalid	Data entry, data analysis, literature search, write-up, gave final approval.	
5	Zia-ul-Islam	Data entry, data analysis, literature search, write-up, gave final approval.	
6	Mohammed Umar	Data analysis, Results interpretation, critically reviewed the manuscript, gave final approval (responsible for the accuracy of the study)	