Original Article

Effect of Periodontal Dressing on Wound Healing and Patient Satisfaction Following Periodontal Flap Surgery

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Abstract

Objectives: It has been claimed that periodontal dressing reduces the risk of wound infection, bleeding and granulation tissue formation and improves tissue healing. This study sought to assess the effect of periodontal dressing on wound healing and patient satisfaction following periodontal flap surgery.

Materials and Methods: This clinical trial was conducted on 33 patients presenting to Hamadan University, School of Dentistry in 2012 whose treatment plan included two periodontal surgical procedures on both quadrants of the maxilla or mandible. The variables evaluated were severity of pain, bleeding, facial swelling and ease of nutrition experienced by patient during the first 3 days after surgery and inflammation, granulation tissue formation and gingival color at 7 and 14 days. Obtained data were analyzed using SPSS version 16.0 and R software and chi-square and t-tests.

Results: The mean (±SD) pain score was 1.73±1.153 and 2.79±1.933 in surgical sites with and without periodontal dressing, respectively and this difference was statistically significant (P=0.005). No significant difference was noted between sites with and without periodontal dressing in terms of swelling, bleeding, gingival consistency, granulation tissue formation, gingival color and ease of nutrition (P>0.05).

Conclusion: According to the results of the present study, patients did not experience more bleeding, facial swelling or nutritional problems without periodontal dressing; however, the level of pain experienced was lower after surgeries with the use of periodontal dressing.

Key words: Periodontal dressings; Surgical flaps; Pain; Wound healing

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INTRODUCTION

In periodontal surgery, the surgical site is usually covered with surgical dressing. The history of dressing dates back to 1923 when Ward introduced "Wondrpack" with the aim of protecting the surgical site, splinting of soft tissue and mobile teeth, immobilization of the surgical site, preventing tooth hypersensitivity and enhancing patient comfort [1]. During the following years, periodontal packs were produced under different brand names with different compositions; their characteristics were extensively studied and underwent several changes. For instance, eugenol-containing compounds were discontinued due to allergic reactions and some other agents were incorpo-

rated into the composition of periodontal packs [2]. In 1984, a review article discussed the positive effects of periodontal dressings. Sachs in this article explained the benefits of dressing for minimizing the risk of post-operative complications such as wound infection and bleeding, enhancing tissue healing by preventing physical trauma during mastication and speech and inhibiting granulation tissue formation [3-5]. It was long believed that covering the surgical site with periodontal dressing prevents microbial infections by decreasing plaque accumulation [6, 7]. However, absence of dressing is the preference of some clinicians. There are studies that have questioned the positive effects of periodontal dressing on wound healing [8-10] while some others that have discussed its negative effects on surgical site healing [11, 12].

The possibility to reduce post surgical pain is among the main reasons for clinicians to cover the surgical site with dressing. In this respect, it has been claimed that the periodontal packs may reduce post-operative pain and discomfort only by protecting the surgical site and they do not have therapeutic effects. Ghanbari et al. confirmed pain reduction following the use of periodontal dressing [13]; whereas, Moghare Abed et al, [14] Bae et al, [2] and Checchi et al. [15] reported the degree of post-surgical pain to be equal in patients with and without periodontal dressing. These results do not encourage the clinicians to place a dressing on surgical sites.

Finally, reviewing the available evidence does not answer the clinicians' question about the necessity of covering the surgical site with periodontal dressing. Therefore, this randomized clinical study was performed to compare the objective and subjective signs and symptoms of patients following periodontal surgery in presence and absence of dressing.

MATERIALS AND METHODS

This randomized clinical trial was approved by the Research and Ethics Committees at Hamadan University of Medical Sciences with the IRCT number of IRCT201211139002N3. Thirty-three patients presenting to Hamadan University, School of Dentistry were evaluated during March-August 2012.

Since this study had a within-subjects design, the following formula was used for sample size calculation: n=[SD*(Z1-a/2+Z1-B)/d]2 where SD is the standard deviation of the difference between VAS scores of the two groups of with and without dressing. The amount of SD was calculated to be 2.05 according to a pilot study. Z1-a and Z1-B are the 97.5th and 80th percentile of the standard normal distribution and are equal to 1.96 and 0.84, respectively; d is the minimum difference between the mean VAS score of groups with and without dressing and was calculated to be 1. This study was conducted on patients who, according to their treatment plan, required at least two periodontal surgeries on both quadrants of the maxilla or mandible. In order to match the two surgical sites as much as possible, patients with equal severity of periodontal disease (according to the clinical attachment loss) at the two sites requiring the same type of surgery (modified Widman flap) were selected and enrolled. One surgeon performed both surgeries for each patient. The exclusion criteria were:

1. History of antibiotic therapy in the past two months
2. History of corticosteroid therapy in the past two months
3. Use of hormonal drugs in the past two months
4. Diabetes mellitus
5. Aggressive periodontitis
6. Smoking
7. Patients who had impaired healing, developed fatigue for any reason after the first surgery or experienced an unexpected perioperative event traumatizing the tissue.

Subjects were randomly divided into two groups of A and B based on their order of inclusion in the study using R software.

In group A, the first surgical site was covered with periodontal pack while the second surgical site remained uncovered. For group B, the first surgical site remained uncovered while the site of second surgery was covered with periodontal dressing. Periodontal dressing used in our study was COE-PAK™ (G.C, America, Inc.).

After both surgeries, 0.2% chlorhexidine mouthwash (Iran Darou Inc.) was prescribed twice daily along with 500 mg amoxicillin (SinaDarou Inc.) every 8 hours for one week and 400 mg Gelofen (SinaDarou Inc.) every 12 hours for 2 days [2]. Patients were advised to use the medications as prescribed following both surgeries. At 7 (dressing removal) and 14 days post-operation, the clinician examined the patients and some clinical parameters (namely gingival color and consistency and presence of granulation tissue) were evaluated [2].

The patients were asked about their post surgical experience and pain, bleeding, ease of nutrition and existence of visible facial swelling during the first 3 days after surgery by means of a questionnaire. Pain severity was assessed using Visual Analog Scale (VAS) ranging from 0 (no pain) to 10 (worst imaginable pain). Gingival color at the site was assessed by visual observation and comparison of the color of surgical site with that of healthy gingiva and categorized as red, dark pink or pale pink. Gingival consistency was determined using a periodontal probe and by observing whether the probe tip left an impression on the gingiva.

Presence of granulation tissue was visually determined. Less than 2mm of granulation tissue at the gingival margin was categorized as mild and larger than 2mm as severe. A 2-week time interval was maintained between the two surgeries in order for the patient status (in terms of understudy variables) to return to its normal condition. Also, by doing so we eliminated the risk of signs and symptoms of the second surgery affecting those of the first procedure [9]. Furthermore, no information was given to patients regarding the benefits or disadvantages of periodontal dressing in order to eliminate its psychological effect as much as possible. Comparison of a qualitative response between the two groups was performed using McNemar's test. Also, we used paired samples t-test to compare the quantitative response in the above-mentioned groups. Statistical analyses were performed using SPSS version 16 and R software.

RESULTS

A total of 33 patients were evaluated. The mean age (±SD) of patients was 35.73 (±8.274) yrs. and 57.5% were females. In 33 surgeries with periodontal dressing, the mean score of pain was 1.73 (±1.153). This score was 2.79 (±1.933) in surgeries without periodontal dressing. Paired t-test was applied to compare the mean score of pain in the two groups of surgeries with and without dressing. The difference in this respect between the two groups was statistically significant (P=0.005) and patients with periodontal dressing reported significantly less pain (Table 1).

Table 1. Severity of pain (pain score) in surgical sites with and without periodontal dressing

Surgery	Use of periodontal pack	Number (percentage)	Severity of pain (pain score out of 10)				P value
			Mean	SD	Minimum	Maximum	
First	No	21 (31.8)	3.19	2.228	0	7	0.005
	Yes	21 (31.8)	1.62	1.244	0	5	
Second	No	12 (18.1)	2.08	0.996	1	5	
	Yes	12 (18.1)	1.92	0.996	0	4	
Total	No	33	2.79	1.933	0	7	
	Yes	33	1.73	1.153	0	5	

In our study, no significant difference was observed between surgical sites with and without periodontal dressing in terms of facial swelling and gingival bleeding (P=0.999 and 0.388, respectively) and using periodontal dressing had no clinical effect on facial swelling in 25 patients (75.8%) during the first 7 days post-operation. In the first 3 days post-operation, 20 patients (57.9%) had similar nutritional status in the two groups and no statistically significant difference was detected in this respect between the two groups (P=0.754, 3 days after surgery). Gingival color was not significantly different between the two groups either (P=0.999, 0.754 and 0.999 at 7, 10 and 14 days after surgery, respectively) and 15 patients (45.5%) had similar gingival color at 7 days post-operation. This rate was 18 patients (54.5%) at 14 days post-operatively. Gingival consistency was not significantly different between the two groups at days 7 and 14 post-surgery (P=0.180, 0.219 and 0.500 at 7, 10 and 14 days after surgery, respectively). No statistically significant difference was detected between the two groups regarding the amount of granulation tissue formed (P=0.057, 0.180 and 0.999 at 7, 10 and 14 days after surgery, respectively).

DISCUSSION

Periodontal dressings were introduced aiming to decrease the risk of surgical site infection and bleeding, enhance wound healing and reduce patients' pain and discomfort. However, these advantages were later questioned by some researchers. Although some clinicians are still in favor of positive effects of periodontal dressings, some others prefer not to use them. In 2012, Genovesi et al, in their split mouth study reported that periodontal packs were effective for improving the results of non-surgical treatment of patients and attributed this effect to enhanced clot stability and decreased risk of bacterial infection [16].

Saito et al, in their histologic study reported tissue inflammatory reaction to Coe-pack®, Vocopac® and Perio Bond® [17].

Moreover, two studies evaluated and compared the effects of periodontal dressings and chlorhexidine gluconate on healing after gingivectomy and beveled flap and reported no significant differences between them [10, 11]. Bose et al. suggested that periodontal dressing leads to more inflammation immediately post-surgery; which may in turn delay the wound healing response [14].

In our study, the mean pain score reported by patients with periodontal dressing in both first and second surgeries was significantly lower than that in patients without periodontal dressing (P<0.05). We prescribed two doses of 400 mg Gelofen for two days after each surgery and none of the patients reported alternative number of used analgesics. Thus, the analgesics did not affect the pain scores. Our finding was in accordance with the results of Ghanbari et al [9]. Less pain with the use of periodontal dressing can be attributed to the coverage of denuded root surfaces and reduced dental hypersensitivity because in the majority of periodontal patients debridement traumatizes the cementum and causes denuded root dentin and subsequent tooth hypersensitivity. Periodontal pack covers the denuded root surfaces and reduces post-surgical pain. However, Moghare Abed et al [8], Checchi et al [15], and Bae et al. [2] reported similar pain scores in patients with and without periodontal dressing following periodontal surgery; while Jones et al. reported greater pain due to using dressing after surgery [13]. This difference between their study results and ours may be due to the different severity of disease among understudy patients because by the progression of periodontal disease, bone loss and gingival recession increase and result in denuding of a larger root surface area. Therefore, root surface debridement increases tooth hypersensitivity. In contrast, in patients with mild periodontitis bone loss and gingival recession are minimal and a smaller cementum surface is invasively manipulated.

In our study, the majority of patients in both groups did not report facial swelling and peri-

odontal dressing had no effect on facial swelling after the surgical procedure. Bose et al. indicated more facial swelling in dressed sites and attributed this finding to the bulkiness of dressing [14].

In terms of gingival bleeding, the majority of patients in both groups had no or minimal bleeding during the first 3 days following surgery. In periodontal surgery, active bleeding is usually managed by the complete removal of the granulation tissue and adequate suturing of the site and periodontal dressing is not used for the control of post-surgical active bleeding. However, in some patients oozing may produce blood taste in their mouth during the first hours after surgery and according to the results of this study presence of pack had no effect on oozing.

In our study, most patients had no nutritional problem during the first 3 days following surgery and periodontal dressing did not decrease or increase post-surgical nutritional problems. Bae et al [2], and Moghare Abed et al. [8] found no difference in patient discomfort between groups with and without periodontal dressing. Their results are in agreement with our findings. Our study revealed that in most patients gingival color was dark pink at 7 days and pale pink at 14 days post-surgery. Furthermore, gingival consistency was relatively normal at day 7 and completely normal at day 14 post-operation. Thus, use of periodontal dressing had no effect on gingival inflammation after surgery and gingival color and consistency were the same with and without the use of periodontal dressing. At 7 and 14 days post-operation, the majority of patients in both groups had no granulation tissue. Based on the current study results, use of periodontal pack had no effect on decreasing the bleeding, inflammation and nutritional problems or enhancing wound healing after surgery. It only decreased post-operative pain by preventing contact with the stimulating factors. However, periodontal dressing may be more efficacious in cases with apical flaps or grafts.

CONCLUSION

Within the limitations of this study, we found that the mean pain score was significantly lower in surgical sites with periodontal dressing. However, no significant differences were observed between the two groups in terms of facial swelling, gingival bleeding, ease of nutrition, gingival color, gingival consistency and granulation tissue formation after surgery. Therefore, post-surgical healing is probably not affected by the periodontal dressing but it can be beneficial for reducing post-operative pain.

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