Application of Platelet-Rich Fibrin Membrane and Collagen Dressing as Palatal Bandage for Wound Healing: A Randomized Clinical Control Trial

Abstract

Background: The palatal donor site of the free gingival graft (FGG) significantly influences the pain and discomfort experienced by the patient, and there is a potential for postoperative bleeding. The aim of this study was to compare the wound healing parameters with the use of a commercially available collagen dressing (CollaCote®) and platelet-rich fibrin (PRF) membrane as palatal bandage.

Materials and Methods: Twenty patients requiring FGG either for reduced/inadequate gingiva or gingival recession in the maxillary or mandibular anterior region were divided into two groups. In the first experimental group (10 patients), CollaCote® membrane was placed over the palatal wounds; conversely, the second experimental group patients were treated with a PRF membrane as palatal bandage. Clinical parameters recorded includes depth, immediate, and delayed bleeding, size of wound, pain, and tests for epithelialization which included hydrogen peroxide test and toluidine blue test at various time intervals. Results: Intrigroup comparisons showed significant improvement in wound healing parameters in both the groups. No statistically significant difference was found on intergroup comparison with respect to depth, hemorrhage, pain, epithelialization, and size, though the PRF group healed slightly better initially. Conclusion: Both CollaCote® and PRF palatal bandages significantly accelerate palatal wound healing and reduce the patient’s pain and discomfort. PRF was easier to handle and suture and is also autogenous and economical as compared to CollaCote®.

Keywords: Collagen, palatal bandage, platelet-rich fibrin, wound healing

Introduction

Free gingival graft (FGG) is a surgical technique used to increase keratinized tissue dimensions. The most common site to procure wide, shallow grafts is from the palatal mucosa between distal aspect of the root of canine to mesial aspect of the palatal root of the first molar.[1,2] The main drawbacks of FGG are the two surgical sites, pain and discomfort experienced by the patient, especially at the donor sites and potential for postoperative bleeding from the donor area which heals by secondary intention resulting in longer healing time and discomfort in the first 2 postoperative weeks.[3,4]

To overcome these postoperative problems on the donor site, a variety of methods such as sutures[5] and dressing materials[6] have been used, but these provide an inert mechanical barrier, thereby assisting healing by just prevention of external influences on the wound area. These neither influence cellular behavior nor play a major role in the biological events that take place during wound healing.

Collagen dressings have extensively been used in dentistry due to its ability to achieve hemostasis, being chemotactic to fibroblasts and platelets, and inducing mesenchymal proliferation and differentiation.[7] CollaCote® is a highly porous absorbable type I Bovine Collagen wound dressing fabricated from bovine deep flexor (Achilles) tendon, marketed by Zimmer dental®. CollaCote® dressings control bleeding and stabilize blood clots as well as protect the wound bed while accelerating the healing process.[7]

Platelet-rich fibrin (PRF),[8] on the other hand, is a platelet concentrate that contains all the constituents of a blood sample which are favorable for healing and immunity. The slow polymerization mode confers to the PRF a particularly favorable physiologic architecture to support the healing process.[8‑10] The fibrin matrix is remodeled in a way comparable with a natural clot and does not dissolve rapidly after application.

How to cite this article: Sharma V, Kumar A, Puri K, Bansal M, Khatri M. Application of platelet-rich fibrin membrane and collagen dressing as palatal bandage for wound healing: A randomized clinical control trial. Indian J Dent Res 2019;30:881-8.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

© 2020 Indian Journal of Dental Research | Published by Wolters Kluwer - Medknow
The purpose of this study was to compare the efficacy of a commercially available collagen dressing (CollaCote®) with the autologous PRF membrane as a palatal bandage on the wound healing of palatal donor site of FGG.

Materials and Methods

Twenty systemically healthy patients (5 males and 15 females) who reported to the outpatient department of periodontology from May 2014 to June 2015 were screened on the basis of inclusion and exclusion criteria, after taking ethical clearance from the Ethical Committee of Institute of Dental Studies and Technologies, with reference number IDST/ERBC/2013/08 and was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2000. This randomized parallel designed human clinical trial is registered at WHO-Clinical Trials Registry-India (CTRI/2017/01/007719).

Systemically healthy patients not under any medication for the past six months, requiring FGG either for reduced/inadequate gingiva or gingival recession in the maxillary or mandibular anterior region and who had not undergone any palatal graft procedure in the past one year, were included in the study. Smokers, pregnant females, lactating mothers, and patients not maintaining oral hygiene were excluded from this study.

Informed written consent was obtained from all the selected participants, fulfilling the inclusion and exclusion criteria. Full mouth plaque index\(^{[11]}\) and gingival index (GI)\(^{[23]}\) were recorded. All the selected participants underwent full-mouth scaling and polishing and root planing of the required area and were instructed regarding oral hygiene measures for home care.

The participants were re-evaluated after two weeks, and those having plaque and GI scores of less than one were finally included in the study and underwent routine blood investigations.

Randomization

Twenty selected participants were randomly allocated to one of the experimental groups, Group 1: Donor site coverage with a commercially available collagen dressing (CollaCote®) \((n = 10)\); Group 2: Donor site coverage with an autologous PRF membrane \((n = 10)\). Assignment and randomization was done by toss of a coin. To conceal allocation, sequentially numbered opaque-sealed envelopes were used, containing the slips with Group 1 or Group 2 written, were opened during surgery immediately before fabricating the palatal bandage.

Presurgical preparation

A tracing grid stent was fabricated using a transparent sheet keeping it on the maxillary cast between the distal surface of canine and mesial surface of first molar. To standardize the measurements, only two sizes of stents were selected, square stent measuring 15 mm × 15 mm and rectangle stent measuring 18 mm × 12.5 mm both having an area of 225 mm\(^2\). Each stent was divided into five equal parts and six replicas of the stent (square or rectangle) were made. In one of the prepared stents, holes were punched in each of the five parts to measure the depth of donor site (D-stent). The remaining five stents, were prepared with one missing part (either 1, 2, 3, 4, or 5) to apply hydrogen peroxide and toluidine blue solutions exclusively on the area to be examined during the recall visits of the healing phase as shown in Figure 1a.

Surgical technique

All the surgical procedures were performed by one experienced surgeon in all the patients to minimize differences related to surgical technique and patient handling.

Preparation of recipient site

Following the administration of local anesthesia, a #15 blade was used to make a horizontal incision in the vestibule and the recipient bed was undermined. The de-epithelialization of the recipient bed below cementoenamel junction was done in cases where root coverage was anticipated and below recession defect where only increasing the width of attached gingiva was considered. A sterilized aluminum foil template of the recipient site was used to measure the size of graft required at the recipient site.

Donor site

The prepared stent was placed on the palatal donor site, and the standardized rectangular or square partial thickness graft chosen as per the requirement was harvested from distal aspect of canine till first molar tooth. The blade was inserted to the desired thickness at one edge and lifted using a tissue forceps. The graft was separated using a blade till it was free from all sides. Tissue tags were removed and trimmed to required size. Following the removal of the graft, pressure was applied to the wound area for control of bleeding. Graft measurements were performed by a different examiner.

Suturing of graft at recipient site

The harvested graft was resized and shaped according to the requirement and was sutured on to the recipient site.

Donor-site dressing

Using the prepared aluminum foil template in Group 1 \((n = 10)\), the palatal wound was protected by a commercially available collagen membrane CollaCote® [Figure 1b], conversely Group 2 patients \((n = 10)\) had their wound protected using PRF membrane [Figure 1c] prepared according to the protocol recommended by Choukroun et al.\(^{[10,13]}\) The dressings were sutured using four interrupted sutures at four corners of wound by 4-0 silk suture and a 3/8, 16 mm reverse cutting needle.
Wound healing and patient morbidity

The primary outcome was to assess the depth, size of wound, and tests for epithelialization which included hydrogen peroxide test and toluidine blue test, using the prepared standardized stents as described earlier. The secondary outcomes were to assess any immediate or delayed bleeding, and pain/discomfort postoperatively [Figure 1d-g].

Depth

Following administration of local anesthesia thickness/depth of the palatal mucosa was measured in the five parts of tracing grid (D-stent) using a sterile standard endodontic K-file of size 15 from the surface of the mucosa to the bone.\(^7\) The depth of the palatal mucosa was measured in both the groups at the center of each column and average depth of five columns was calculated and used as average depth of the wound [Figure 1h], before surgery, and of the wound immediately after harvesting the graft; postapplication of palatal dressing (CollaCote\(^\text{®}\) or PRF membrane) and then on 12th, 24th, and 30th postoperative days.

Bleeding

1. Immediate bleeding was looked for, after suturing the donor area and 2 min of external pressure. Hemostasis was confirmed when no bleeding was seen, and clinical photograph of the wound was taken without need for suction\(^7\)
2. Delayed bleeding was recorded as prolonged hemorrhaging from the palate during the postsurgical period as reported by the patient at 7th postoperative day\(^7\)

Pain

Pain was recorded according to visual analog pain rating scale on the day of surgery and at 7th, 12th, 18th, 24th, and 30th postoperative days.\(^14\) The scoring was done from 0 to 5.

Epithelialization

Epithelialization test by H\(_2\)O\(_2\)

Epithelialization test by H\(_2\)O\(_2\)\(^{[5]}\) requires recordings on two consecutive days. Hence, healing by H\(_2\)O\(_2\) was also assessed on the 7th, 8th, 12th, 13th, 18th, 19th, 24th, 25th, 30th, and 31st postoperative days. The peroxide test measured the quality of epithelial barrier.\(^{[15-17]}\) The area to be evaluated was dried and 3% H\(_2\)O\(_2\) was applied on each of the five cut portions of the prepared tracing grids one by one, thus evaluating healing in a particular region at a time. The negative peroxide test for two consecutive days indicated complete healing [Figure 1i].

Toluidine blue test

Toluidine blue dye adheres to nonepithelial tissues and imparts blue color to them. Therefore, if dye is not retained it suggests that clinically, the wound is healed.\(^{[18]}\)

On the follow-up days, each of the five cut stents/tracing grids were placed on the wound and wound was painted
with toluidine blue one by one, thus evaluating the healing in a particular region at a time [Figure 1j].

**Size**

Size of the wound was measured using periodontal probe on 7th, 12th, 18th, 24th, and 30th postoperative days. Length and width of the wound were measured and the area was calculated. The raw wound was stained dark by toluidine blue which made the measuring of wound easy [Figure 1k].

**Statistical analysis**

For intragroup analysis, repeated measures ANOVA test was applied as a preliminary test for depth and size and “paired t-test” was then run as a confirmatory test. “Unpaired t-test” was used to compare intergroup results for depth and size. For pain evaluation, epithelialization by toluidine blue and hydrogen peroxide test comparison on follow-up days with baseline was evaluated using Wilcoxon signed-rank test for intragroup comparison, and Mann-Whitney rank sum test was applied for intergroup analysis. Fisher’s exact test were used for comparison of nominal/categorical data. The P < 0.05 was taken as significant. Medcalc statistical software version 14.2.1.0 was used for all statistical calculation.

**Results**

The number of males were 5 (3 in CollaCote® group and 2 in PRF group) in the age range of 20–52 years with the mean age 36.2 years and 15 females (7 in CollaCote® group and 8 in PRF group) in the age range of 18–48 years with the mean age 30.33 years. No patients dropped out of the study, and no postoperative complications were reported by the patients at the end of the study.

The comparisons of all the clinical parameters were done both within and between the two groups and also each of the wound was divided according to the wound configuration into either square (n = 10; 5 CollaCote® and 5 PRF) or rectangle wound (n = 10; 5 CollaCote® and 5 PRF).

On intragroup comparison, it was found that when preharvest depth was compared with postdressing depth on the day of surgery and at 12th, 24th, and 30th postoperative days, the difference was statistically nonsignificant for both the groups. When the depth was compared postharvesting and after suturing of dressings in both CollaCote® and PRF groups, the difference was statistically significant and the difference remained significant at all the follow-up visits. Intergroup comparison difference was found to be nonsignificant [Table 1]. The results were also nonsignificant with square and rectangular wounds.

No case of immediate bleeding in any of the groups was observed. Both the groups showed equal number of delayed bleeding cases (30% of cases). Furthermore, equal number of square and rectangular groups showed delayed bleeding (1 square and 2 rectangular wounds in CollaCote® group and 2 square and 1 rectangular in PRF group).

### Table 1: Depth analysis

| Follow-up days | CollaCote® (n=10) | PRF (n=10) | CollaCote® versus PRF (P*) |
|----------------|-------------------|------------|---------------------------|
|                | Mean | SD | Mean | SD | SD |
| Preharvesting  | 5.15 | 0.57 | 5.11 | 0.72 | 0.881 |
| Postharvesting | 3.98 | 0.73 | 3.87 | 0.86 | 0.761 |
| Dressing       | 5.3  | 0.86 | 5.03 | 0.67 | 0.451 |
| 12th day       | 5.36 | 0.42 | 5.12 | 0.27 | 0.144 |
| 24th day       | 4.85 | 0.48 | 5.04 | 0.43 | 0.365 |
| 30th day       | 4.75 | 0.44 | 4.83 | 0.65 | 0.751 |

Intragroup comparison on follow up days

| Follow-up days | CollaCote® (n=10) | PRF (n=10) | P* |
|----------------|-------------------|------------|----|
| Preharvesting-postharvesting | <0.001* | <0.001* |
| Preharvesting-dressing | 0.487 | 0.619 |
| Preharvesting-12th day | 0.28 | 0.96 |
| Preharvesting-24th day | 0.183 | 0.694 |
| Preharvesting-30th day | 0.11 | 0.08 |
| Postharvesting-dressing | <0.001* | <0.001* |
| Postharvesting-12th day | <0.001* | 0.002* |
| Postharvesting-24th day | 0.003* | <0.001* |
| Postharvesting-30th day | 0.011* | 0.001* |
| Dressing-12th day | 0.797 | 0.696 |
| Dressing-24th day | 0.068 | 0.944 |
| Dressing-30th day | 0.029* | 0.296 |

*P<0.05 is considered significant, †Paired t-test, ‡Unpaired t-test, **Repeated measures ANOVA. SD=Standard deviation, PRF=Platelet-rich fibrin
No statistically significant difference was observed when pain in both the groups was compared post surgically on all days, except on the day of surgery, the pain scores and discomfort was seen to be more in CollaCote® group as compared to PRF which equalizes by the 30th postoperative day [Table 2]. On intragroup comparison statistically significant difference was obtained while comparing the change between the follow-up days, 0–24th day and 0–30th day for CollaCote® group and on 0–18th day and 0–30th day which shows the early reduction in pain in PRF group, though the intergroup comparisons were nonsignificant.

On intragroup comparison of unhealed columns by hydrogen peroxide test and toluidine blue test for both CollaCote® and PRF groups, statistically significant difference was observed by 18th postoperative day. The test could not be run from the 7th–12th day due high number of similar values (NA). The 7th postoperative day was considered as baseline for test of epithelialization. On intergroup comparison, no statistically significant difference was obtained [Table 3]. No significant difference was observed in rectangular or square wound in both inter- and intragroup comparisons.

On comparing the length, breadth, and area, no statistically significant difference was observed in the healing of both the groups in the same followup days. Faster healing was observed in PRF group initially until the 12th postoperative day.

### Table 2: Intra- and intergroup evaluation of mean pain scores in CollaCote® and platelet-rich fibrin groups at all follow-up days

| Days  | CollaCote® (n=10) | PRF (n=10) | CollaCote® versus PRF (P*) |
|-------|-------------------|------------|-----------------------------|
|       | Square (n=5) Rectangular (n=5) Mean SD | Square (n=5) Rectangular (n=5) Mean SD |           |
| 0 day | 1.2 1.8 1.5 1.179 | 2.6 1.8 2.2 2.15 | 0.677 |
| 7th day | 3.2 3.2 3.2 1.814 | 1.8 2 1.9 1.101 | 0.096 |
| 12th day | 1.4 1.6 1.5 1.65 | 1 0.6 0.8 0.789 | 0.426 |
| 18th day | 0.4 0.8 0.6 0.699 | 0.5 0.4 0.3 0.483 | 0.403 |
| 24th day | 0.2 0.8 0.5 0.707 | 0.2 0.6 0.4 0.699 | 0.761 |
| 30th day | 0 0.2 0.1 0.316 | 0 0.2 0.1 0.316 | 0.969 |

### Table 3: Intra- and intergroup comparison of epithelialization by hydrogen peroxide test and toluidine blue test based on unhealed columns

| Day      | CollaCote® (n=10) | PRF (n=10) | CollaCote® versus PRF (P*) |
|----------|-------------------|------------|-----------------------------|
|          | Square (n=5) Rectangular (n=5) Mean SD | Square (n=5) Rectangular (n=5) Mean SD |           |
| Hydrogen peroxide test | | | | |
| 7/8      | 5 5 5 0 | 5 5 5 0 | - 0.969 - |
| 12/13    | 4.6 4.4 4.5 0.85 | NA 4.8 3.8 4.3 0.843 | NA 0.596 0.728 |
| 18/19    | 2.4 2.8 2.7 1.075 <0.020 | 3.2 2.2 2.7 2.003 <0.016 | 0.88 0.88 |
| 24/25    | 0.8 1.2 1 1.054 <0.020 | 1 0.6 0.9 0.994 <0.020 | 0.879 0.879 |
| 30/31    | 0.4 0 0.2 1.636 <0.020 | 0 0.2 0.1 0.316 <0.020 | 1 0.673 |

| Toluidine blue test | | | | |
| 7      | 5 5 5 0 | 5 5 5 0 | - 0.968 - |
| 12     | 4.8 4.6 4.7 0.675 | NA 5 4.16 4.5 0.972 | NA 0.728 0.732 |
| 18     | 2.8 3.4 3 1.054 <0.05 | 4.2 2.2 2.9 1.853 | NA 0.675 0.999 |
| 24     | 1.2 1.6 1.1 0.994 0.005 | 1 0.6 0.8 0.789 <0.020 | 0.162 0.429 |
| 30     | 0.4 0 0.2 0.633 0.005 | 0 0.2 0.1 0.316 <0.020 | 1 0.973 |

*Mann-Whitney rank sum test P≤0.05 is considered significant, Wilcoxon signed-rank test P≤0.05 is considered significant. SD=Standard deviation, PRF=Platelet-rich fibrin, NA=Not available.
day; however, this could not reach up to the statistically significant level. Rectangular wounds healed faster though the values were not statistically significant [Table 4]. On intragroup comparison for CollaCote® group, it was found that 73% of wound area was reduced by 18th postoperative day and 92% by 24th postoperative day. In PRF group, it was found that 81% of wound area was reduced by 18th postoperative day and 92.4% by 24th postoperative day. It was also evident that 90% of wounds healed completely by 30th postoperative day in both groups.

**Discussion**

In the present study, the standardization of wound size and shape has been done to study the healing in square wounds and rectangular wounds with wound area of 225 mm². This standardization of area helps in comparison of area reduction over time.

FGG may be contraindicated if there is inadequate thickness of palatal mucosa. Sufficient thickness of palatal mucosa is necessary for harvesting FGG from the palate. In our study, the CollaCote® and PRF were not only used as palatal dressings but also as fillers for maintaining the thickness of palatal mucosa. A similar outcome was reported by Femminella et al. who suggested that the use of PRF has added to the thickness of residual layer of connective tissue.

In the present study, the intragroup comparisons of depth between postharvesting and after suturing of dressings in both CollaCote® and PRF groups was statistically significant at all the follow-up visits. This shows that CollaCote® and PRF both showed equivalent fills and that both these materials can be used as fillers. CollaCote® being a biocompatible, nonantigenic, and physiologically metabolized material which is fully reabsorbed by the host system could be the reason for the material acting as a favorable space filler. PRF, which is a physiologically three-dimensional fibrin network and can be converted into a strong, resistant membrane, resorbs very slowly, and converts into a resistant connective tissue, could have helped in PRF being a good filler.

No immediate bleeding was observed in any of the groups in the present study, as it has been observed that the protection of palatal donor site by any means results in reduced number of cases requiring emergency visit; this was in accordance with Rossmann and Rees.

In our study, we found 30% delayed bleeding in each of the groups. Only a minimal amount of postoperative bleeding was reported by the patients in our study, which stopped after pressure pack and no patient landed in emergency, this may be because of the protection of palate by dressings and also collagen and PRF both have known hemostatic properties. Kecci et al. also reported fewer cases of delayed bleeding when medicinal plant extract was used at the palatal donor site.

In FGG, the donor site is an open wound that makes postoperative healing more painful and discomforting for the patients. Hence, we covered our wounds by either CollaCote® or PRF. On intragroup analysis, it was observed that pain was reduced significantly by 24th day in CollaCote® and 18th day in PRF group. Shanmugam et al. and Rastogi et al. also found that collagen

| Table 4: Comparison of wound size at all follow-up days from baseline (day 0) |
|--------------------------|--------------------------|--------------------------|--------------------------|
|                         | CollaCote® MD | CollaCote® SD | CollaCote® P<sup>*</sup> | PRF MD | PRF SD | PRF P<sup>*</sup> | CollaCote® versus PRF (P<sup>§</sup>) |
|--------------------------|--------------------------|--------------------------|--------------------------|
| **Length**               |                           |                           |                           |                           |                           |                           |
| 0-7th day                | 0                        | 0                        | NA                       | 0.1                    | 0.316                    | 0.343                    | 0.343                          |
| 0-12th day               | 3                        | 3.055                    | 0.013                    | 4.85                    | 3.972                    | 0.004*                    | 0.258                          |
| 0-18th day               | 8.05                     | 4.438                    | <0.001*                  | 9.45                    | 4.072                    | <0.001*                  | 0.472                          |
| 0-24th day               | 12.75                    | 2.918                    | <0.001*                  | 12.75                   | 3.766                    | <0.001*                  | 1                               |
| 0-30th day               | 16.35                    | 2.561                    | <0.001*                  | 16.35                   | 1.857                    | <0.001*                  | 1                               |
| **Breadth**              |                           |                           |                           |                           |                           |                           |                           |
| 0-7th day                | 0                        | 0                        | NA                       | 0.1                    | 0.316                    | 0.343                    | 0.343                          |
| 0-12th day               | 2.5                      | 3.064                    | 0.064                    | 4.85                    | 3.432                    | 0.002*                    | 0.124                          |
| 0-18th day               | 7                        | 3.197                    | <0.001*                  | 8.4                     | 2.171                    | <0.001*                  | 0.267                          |
| 0-24th day               | 10.1                     | 3.381                    | <0.001*                  | 10.7                    | 2.497                    | <0.001*                  | 0.657                          |
| 0-30th day               | 12.7                     | 1.703                    | <0.001*                  | 13.3                    | 1.889                    | <0.001*                  | 0.465                          |
| **Area**                 |                           |                           |                           |                           |                           |                           |                           |
| 0-7th day                | 0                        | 0                        | NA                       | 2.95                    | 9.329                    | 0.343                    | 0.343                          |
| 0-12th day               | 65.9                     | 67.271                   | 0.013                    | 113.28                  | 70.23                    | <0.001*                  | 0.141                          |
| 0-18th day               | 155.1                    | 50.448                   | <0.001*                  | 180.8                   | 25.581                   | <0.001*                  | 0.168                          |
| 0-24th day               | 197.9                    | 33.864                   | <0.001*                  | 206.5                   | 18.289                   | <0.001*                  | 0.489                          |
| 0-30th day               | 214.8                    | 23.03                    | <0.001*                  | 222.7                   | 3.401                    | <0.001*                  | 0.297                          |

*P<0.05 is considered significant, †Paired t-test, ‡Unpaired t-test. MD=Mean difference, SD=standard deviation, NA=Not available, PRF=Platelet-rich fibrin
dressing relieves pain, as it is biologically acceptable to the oral mucosa and an excellent wound graft material which can dampen the acute inflammatory process during healing. Femminella et al.,[26] in a similar study, found lesser patient morbidity in terms of number of analgesics consumed and altered feeding habits in PRF group. In our study, we have found lesser pain scores in PRF group as compared to CollaCote® group, though the results were statistically nonsignificant, which could be attributed to the smaller sample size, similar to the results obtained by Saroff et al.[2] and Kulkarni et al.[25]

In the present study, the significant difference in wound epithelialization was observed by 18th postoperative day in both the groups in intragroup comparisons. Pedlar[26] reported complete epithelialization by 8 weeks postexcision of full-thickness palatal mucosa. On intergroup comparison of unhealed columns by hydrogen peroxide test between CollaCote® and PRF groups, no statistically significant difference was obtained. This signifies that there was a negligible difference in healing in both the groups. Aravindaksha et al.,[17] Femminella et al.,[20] Kulkarni et al.,[25] and Shakir et al.[27] attributed PRF as a palatal dressing as PRF membrane provide a stable fibrin mesh, which is more rigid than a blood clot, it also provides a sustained release of growth factors and by altering the metabolism of epithelial cells and fibroblasts intensifies fibroblast proliferation and migration inside the wound. Shanmugam et al.[7] compared Coe-Pak™ and CollaCote® on FGG palatal wound healing and concluded that collagen-based dressing offers significantly greater advantages. No statistically significant difference was obtained in toluidine blue test as well which confirms the results of hydrogen peroxide test.

On intragroup comparisons of size, >91% of wound size reduction was observed in both the groups by 24th postoperative day. Kulkarni et al.[25] achieved almost complete wound closure by 7th postoperative day in PRF group. Femminella et al.[20] reported complete resolution of palatal wound size in 100% of PRF-treated site by 3rd week and complete healing in 95% of patients in gelatin sponge group by 4th week. This could be due to PRF being a combination of cytokines, structural glycoproteins, and glycanic chains that play a synergetic role in healing and stimulating angiogenesis, immunity and epithelialization. Aravindaksha et al.[17] reported complete healing by 3rd postoperative week in the PRF group. Del Pizzo et al.[5] reported complete healing in 16% and 50% of patients at the 2nd and 3rd week, respectively, in FGG donor sites without any dressing. On intergroup analysis comparing the length, breadth, and area of both CollaCote® and PRF groups, no statistically significant difference was observed in healing of both the groups at all follow-up days attributed to role of PRF in healing and transformation of absorbable collagen into normal tissue and increase in firmness in CollaCote® group.[7,17] Although results were statistically nonsignificant, faster healing was observed in PRF group initially till 12th postoperative day. This initial surge in healing in PRF group could be attributed to PRF being a bioactive dressing with a high concentrate of leukocytes and release of growth factors during ≤7 days.[26,29]

The healing is also influenced by the shape of its wound as the liner wounds heal fastest followed by rectangular and square wounds and the last to heal wounds are circular wounds. Kahnberg and Thilander[50] also observed that epithelialization progressed from wound boundaries and reduction of wound surface preceded by contraction of the wound margins and by epithelial cell migration, hence the rectangular wounds should heal faster which is evident in our study, though results were not significant. This could be attributed to the smaller difference in the breadth of both the rectangular and square wounds which led to very less observable difference.

Conclusion
Both CollaCote® and PRF could be used as palatal bandages, but we found PRF to be easier to handle and suture as compared to CollaCote®. PRF also has an advantage of being economic, bioactive autologous material with no chance of any adverse reaction by the host.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References
1. Reiser GM, Bruno JF, Mahan PE, Larkin LH. The subepithelial connective tissue graft palatal donor site: Anatomic considerations for surgeons. Int J Periodontics Restorative Dent 1996;16:130-7.
2. Saroff SA, Chasens AI, Eisen SF, Levey SH. Free soft tissue autografts. Hemostasis and protection of the palatal donor site with a microfibrillar collagen preparation. J Periodontol 1982;53:425-8.
3. Brascher WJ, Rees TD, Boyce WA. Complications of free grafts of masticatory mucosa. J Periodontol 1975;46:133-8.
4. Farnoush A. Techniques for the protection and coverage of the donor site in free soft tissue grafts. J Periodontol 1978;49:403-5.
5. Del Pizzo M, Modica F, Bethaz N, Priotto P, Romagnoli R. The connective tissue graft: A comparative clinical evaluation of wound healing at the palatal donor site. A preliminary study. J Clin Periodontol 2002;29:848-54.
6. Sachs HA, Farnoush A, Checchi L, Joseph CE. Current status of periodontal dressings. J Periodontol 1984;55:689-96.
7. Shanmugam M, Kumar TS, Arun KV, Arun R, Karthik SJ. Clinical and histological evaluation of two dressing materials in the healing of palatal wounds. J Indian Soc Periodontol 2010;14:241-4.
8. Choukroun J, Adda F, Schoeffler C, Vervelle A. An opportunity in peri-implantology: The PRF. Implantodontie 2001;42:55-62.
9. Dohan DM, Donsimoni JM, Navarro G, Gaultier F. Platelet
concentrates. Part 2: Associated biology. Implantodontie 2003;12:17-25.
10. Gaultier F, Navarro G, Donsimoni JM, Dohan D. Platelet concentrates. Part 3: Clinical applications. Implantodontie 2004;13:3-11.
11. Silness J, Loe H. Periodontal disease in pregnancy. II. Correlation between oral hygiene and periodontal condition. Acta Odontol Scand 1964;22:121-35.
12. Loe H, Silness J. Periodontal disease in pregnancy. I. Prevalence and severity. Acta Odontol Scand 1963;21:533-51.
13. Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ, Mouhyi J, et al. Platelet-rich fibrin (PRF): A second-generation platelet concentrate. Part I: Technological concepts and evolution. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:e37-44.
14. Wong DL, Hockenberry-Eaton M, Wilson D, Winkelstein ML, Schwartz P. Wong’s Essentials of Pediatric Nursing. 6th ed. St. Louis: Mosby Inc.; 2001. p. 1301.
15. Silva CO, Ribeiro Edel P, Sallum AW, Tatakis DN. Free gingival grafts: Graft shrinkage and donor-site healing in smokers and non-smokers. J Periodontol 2010;81:692-701.
16. Sunita Raja V, Munirathnam Naidu E. Platelet-rich fibrin: Evolution of a second-generation platelet concentrate. Indian J Dent Res 2008;19:42-6.
17. Aravindaksha SP, Batra P, Sood V, Kumar A, Gupta G. Use of platelet rich fibrin (PRF) membrane as palatal bandage. Clin Adv Periodontics 2014;4:246-50.
18. Bansal M, Kumar A, Puri K, Khatri M, Gupta G, Vij H, et al. Clinical and histologic evaluation of platelet-rich fibrin accelerated epithelization of gingival wound. J Cutan Aesthet Surg 2016;9:196-200.
19. Carnio J, Hallmon WW. A technique for augmenting the palatal connective tissue donor site: Clinical case report and histologic evaluation. Int J Periodontics Restorative Dent 2005;25:257-63.
20. Femminella B, Iaconi MC, Di Tullio M, Romano L, Sinjari B, D’Arcangelo C, et al. Clinical comparison of platelet-rich fibrin and a gelatin sponge in the management of palatal wounds after epithelialized free gingival graft harvest: A Randomized clinical trial. J Periodontol 2016;87:103-13.
21. Rossmann JA, Rees TD. A comparative evaluation of hemostatic agents in the management of soft tissue graft donor site bleeding. J Periodontol 1999;70:1369-75.
22. Lacci KM, Dardik A. Platelet-rich plasma: Support for its use in wound healing. Yale J Biol Med 2010;83:1-9.
23. Keceli HG, Aylikci BU, Koseoglu S, Dolgun A. Evaluation of palatal donor site haemostasis and wound healing after free gingival graft surgery. J Clin Periodontol 2015;42:582-9.
24. Rastogi S, Modi M, Sathian B. The efficacy of collagen membrane as a biodegradable wound dressing material for surgical defects of oral mucosa: A prospective study. J Oral Maxillofac Surg 2009;67:1600-6.
25. Kulkarni MR, Thomas BS, Vangheese JM, Bhat GS. Platelet-rich fibrin as an adjunct to palatal wound healing after harvesting a free gingival graft: A case series. J Indian Soc Periodontol 2014;18;399-402.
26. Pedlar J. Healing following full thickness excision of human palatal mucosa. Br J Plast Surg 1985;38:347-51.
27. Shakir QJ, Bhasale PS, Pailwan ND, Patil DU. Comparison of effects of PRF dressing in wound healing of palatal donor site during free gingival grafting procedures with no dressing at the donor site. J Res Adv Dent 2015;4:69-74.
28. Dohan Ehrenfest DM, Diss A, Odin G, Doglioli P, Hippolyte MP, Charrier JB, et al. In vitro effects of Choukroun’s PRF (platelet-rich fibrin) on human gingival fibroblasts, dermal prekeratinocytes, preadipocytes, and maxillofacial osteoblasts in primary cultures. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009;108:341-52.
29. Desai CB, Mahindra UR, Kini YK, Bakshi MK. Use of platelet-rich fibrin over skin wounds: Modified secondary intention healing. J Cutan Aesthet Surg 2013;6:35-7.
30. Kahnberg KE, Thilander H. Healing of experimental excisional wounds in the rat palate. (I) histological study of the interphase in wound healing after sharp dissection. Int J Oral Surg 1982;11:44-51.