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*Case Report*

# Gingival augmentation using bridge flap technique along with platelet-rich fibrin: A case report

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## ABSTRACT

Insufficient gingival marginal tissue thickness and width is a condition commonly encountered in clinical practice and is characterized by apical displacement of gingival margin. This case reports the effectiveness of the bridge flap technique (BFT) in conjunction with platelet-rich fibrin (PRF) as a single-step surgical entity for increasing the depth of the vestibule, gingival thickness, and increasing the width of the attached gingiva (AG). A female patient with Miller's Class III recession on lower central incisors, shallow vestibule, and inadequate width of AG underwent this surgical procedure and was followed-up till 6-month postoperatively. The present technique reported significant enhancement of post-operative clinical outcome showing stabilized increase in the width of AG for 6-months.

**Keywords:** Attached gingiva, Bridge flap, Gingival recession, Mucogingival surgery

## INTRODUCTION

Insufficient gingival tissue is always an important criterion for maintenance and longevity of the dentition. Mucogingival problems form a definitive diagnosis that includes group of clinical findings, including gingival recession (GR), shallow vestibule, inadequate width of attached gingiva (AG), and aberrant frenulum. Surgical attempt by Goldman for the correction of some specific problems, namely, periodontal pockets that extend beyond the AG reaching the alveolar mucosa, an abnormal pull of the frenulum that can transmit tension for the gingival margins and cause recessions, and the functional condition of a shallow vestibule that causes a decrease in the AG levels, initiated the era of mucogingival surgery and development of numerous refinements.[1] Multiple techniques have been developed to obtain predictable root coverage and adequate width of AG. "Bridge flap procedure" is a single-step solution for the continuation of the same endeavor.[2] "Marggraf" in 1985 proposed bridge flap technique (BFT) to cover GR.[3] To the best of authors' knowledge, limited publication has reported the effectiveness of the BFT in conjunction with platelet rich fibrin (PRF) as a single-step surgical entity for increasing the depth of the vestibule, gingival thickness, and increasing the width of the AG.[4] This case report represents a single step cost-effective entity to correct multiple mucogingival problems at a time with less morbidity to donor tissue and to evaluate the correction gained by this bridge flap procedure.

## CASE REPORT

A 59-year-old non-smoker and non-alcoholic (self-reported) patient with non-contributory medical history reported to the department of periodontology with the chief complaint of poor

esthetics in the lower anterior due to recession. Clinical examination revealed that patient was having fair oral hygiene, keratinized gingiva with thin gingival biotype, presence of diastema and pronounced labial inclination, and malpositioning of teeth with respect to 42, 41, 31, and 32 [Figure 1]. To check the adequacy of AG, pull test and roll test were performed by checking any movement of free gingival margin by stretching the lower lip outward coronally and to demarcate the mucogingival line, respectively. Positive pull test revealed inadequate AG [Figure 2]. There was no mobility observed and Fremitus test was negative. After radiographic analysis, patient was diagnosed as generalized periodontitis Stage II Grade A along with Miller's Class III GR with respect to 41 and 31 with soft-tissue loss in the interdental area and recession extending to the mucogingival junction (MGJ) [Figure 3]. Clinical recession was recorded on both the teeth as the shortest distance from the most apical point on cementoenamel junction to the deepest curvature of the gingival margin using a standard periodontal probe (UNC-15). The width of the AG was measured by subtracting pocket depth from the distance from the gingival margin to the MGJ using Goldman-fox flat probe. Gingival biotype was evaluated as "thin biotype" by direct visual assessment using probe transparency method.

Based on clinical conditions and radiographic evaluation, a single step BFT with PRF to combat multiple mucogingival problems was proposed. Complete blood investigations were advised to the patient to rule out any surgical contraindications. Patient was motivated for surgical procedure for increasing the thickness and amount of keratinized gingiva followed by coverage of multiple recessions. The entire surgical treatment process was explained to the patient and a written informed consent was obtained. Non-surgical periodontal therapy was performed and the patient was educated for meticulous oral hygiene maintenance. Patient was educated and advised for orthodontic treatment, but she did not opt for the same.

On the next visit pre-surgical evaluation including chairside blood pressure monitoring, draping and oral disinfection with pre-procedural rinse using 0.2% chlorhexidine (ChlorhexADS, Dr. Reddy's Laboratories Ltd) was done. Local anesthesia with 2% lignocaine hydrochloride with 1:200,000 adrenaline (LOX* 2%, Neon Laboratories Ltd.) was administered through bilateral mental blocks. Root conditioning was performed using EDTA to remove smear layer. An arch-shaped incision was given in the vestibule approximately 2 times the dimension of GR [Figure 4] and sulcular incision was given [Figure 5]. An incision into the perisoteum was also placed at the base and the bone was exposed so that scar formation could occur. A split-thickness flap was elevated by making a crevicular incision from the gingival sulcus in the coronoapical direction using sharp

**Figure 1:** Pre-operative photograph showing insufficient width of attached gingiva, presence of diastema, and Miller's Class II recession on teeth 31 and 41.

**Figure 2:** Pre-operative photograph (lateral view) showing insufficient width of keratinized gingiva on teeth 31 and 41.

dissection, connecting it to the first incision so that the whole bridge flap could be elevated [Figure 6].

For the preparation of PRF, 10 ml of blood was withdrawn from the antecubital region of the patient's forearm and immediately centrifuged at 3000 rpm for 15 min in a table top centrifuge. Fibrin clot obtained was carefully separated from the test tube and placed under the raised flap [Figures 7 and 8]. The PRF clot obtained was placed under the flap and squeezed for 2 min using wet gauge and digital pressure. Both PRF and the flap were sutured coronally using 4-0 silk sling suturing technique to cover the denuded root surfaces as much as possible [Figure 9]. The vestibular incision was approximated by suturing apical lip flap with the vestibular periosteum. Periodontal dressing (Coe-pak) was applied to the surgical site [Figure 10] and written post-operative instructions were given to the patient. Antibiotics

**Figure 3:** Radiograph showing bone loss with respect to teeth 31 and 41.

**Figure 5:** Intra-operative photograph showing crevicular incision.

**Figure 4:** Intra-operative photograph showing arch shaped incision in the vestibule.

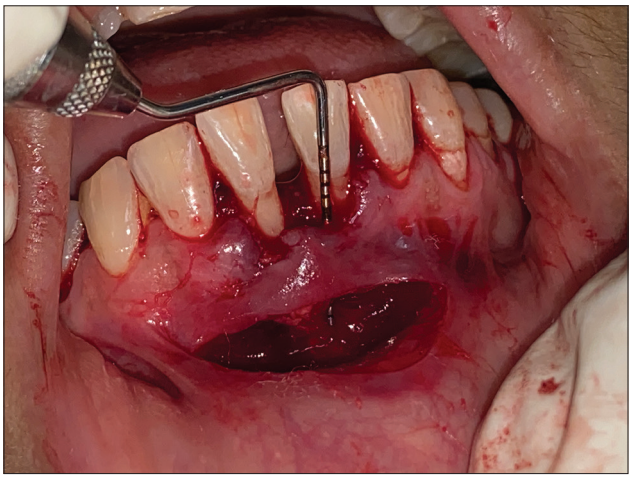

**Figure 6:** Intra-operative photograph showing split thickness bridge flap raised connecting the crevicular and vestibular incision.

(Tab. Augmentin 625 mg twice daily) were prescribed for 07 days. Analgesics (Tab. Ketorol DT 10 mg twice daily) were prescribed for 03 days. Patient was asked to report after 2 weeks for post-operative follow-up [Figure 11]. On recall visit, sutures were removed and clinical examination revealed uneventful healing with partial root coverage, increased width of AG and increase in gingival thickness. Stabilized increased width of AG and augmentation in gingival biotype was appreciable at 6-month follow-up period [Figure 12 and 13]. Oral hygiene instructions were re-enforced and patient was asked to maintain maintenance protocol.

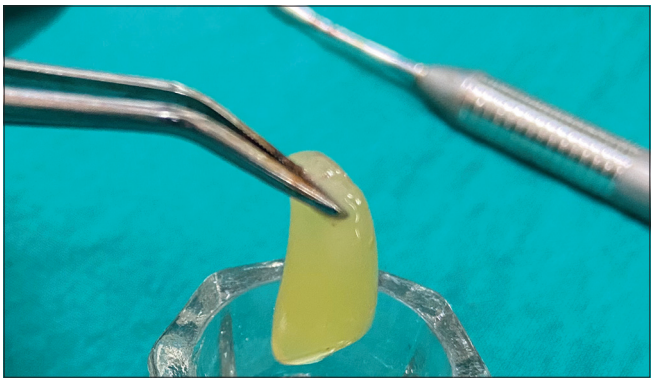

**Figure 7:** Photograph showing platelet-rich fibrin prepared.

## DISCUSSION

An evaluation of adequate width of AG and biotype is important factor as <2 mm of AG and thin gingival tissue will increase the risk of GR and facilitate subgingival plaque formation because of incomplete pocket closure.[5,6] The BFT is often indicated as a single surgical procedure to cover the denuded root surfaces and increase zone of keratinized gingiva and AG with vestibular deepening at one step.[7] PRF, which is a second generation platelet concentrate consisting of suspension

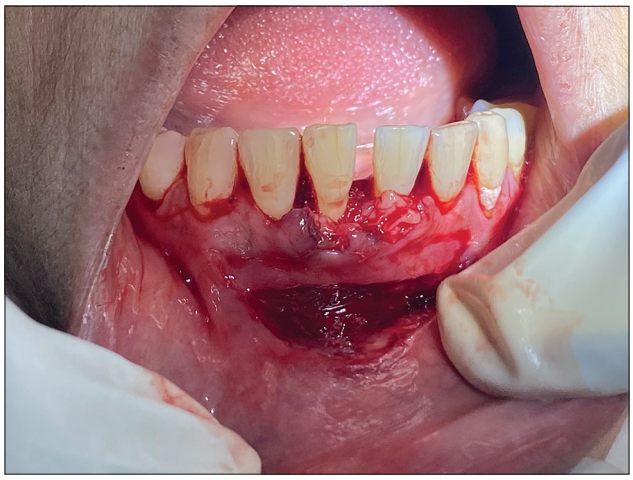

**Figure 8:** Photograph showing PRF placed and packed under the bridge flap.

**Figure 9:** Intra-operative photograph showing coronal positioning and suturing of the bridge flap along with the PRF.

**Figure 10:** Photograph showing Coe-pak applied over the surgical site.

**Figure 11:** Two-week post-operative photograph of surgical site.

**Figure 12:** Six-month follow-up photograph of surgical site showing stabilized increased zone of attached/keratinized gingiva and partial recession coverage.

**Figure 13:** Six-month follow-up photograph (lateral view) showing increased width of keratinized/attached gingiva on teeth 31 and 41.

of the growth factors in platelets, is being widely used in the management of periodontal defects. PRF used with BFT, served as a resorbable membrane in which platelet cytokines, growth factors, and cells are trapped and may be released after a certain time.[8] PRF is considered as a healing biomaterial and is used to enhance bone regeneration and soft-tissue healing in periodontal plastic surgeries and implants. PRF application has been an effective and predictable treatment modality for the management of multiple recessions-type defects in terms of RC, increase in gingival tissue thickness.[9,10] Because of the nature of the paper, quantification of the data related to GR, thickness, biotype, and width of AG could not be done, making it one of the limitations of our study. Nevertheless, increase in width of AG can be appreciable clinically as compared to baseline clinical situation.

## CONCLUSION

The present case report showed augmentation in gingival tissue using BFT with PRF. However, quantification of gingival augmentation was not performed and results obtained were discussed using clinical experience only. Nonetheless, the PRF along with BFT could be a promising solution for multiple mucogingival problems and this case report can present an insight for the future BFT modification procedures. Therefore, long-term, multicentric, randomized, and clinical trials are required to validate the results.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

### Conflicts of interest

Dr. Vivek Kumar Bains is editor of this Journal.

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