

# Bridge Flap Technique- A Single Step Solution to Multiple Mucogingival Problems

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## ABSTRACT

Gingival recession is a common problem in periodontal practice today. There are many causes that lead to gingival recession and there are also numerous different surgical techniques to manage this problem including laterally sliding flaps, free gingival grafts, coronally positioned flaps, connective tissue grafts, guided tissue regeneration, and tissue engineering. When esthetic is the prime concern it is essential to have a good soft tissue to tooth relationship to ensure an ideal emergence profile. The main objective of the periodontal plastic surgery is to correct and re-establish such a relationship. The procedures presented in the literature in the past half a century has proved to be effective in pursuing the goal of covering exposed root surfaces. These surgical solutions, although possessing their own merits, posed certain problems; chiefly, their insufficiency to treat additional problems concurrently. A single-step solution to mucogingival problems by a surgical interference, namely the "bridge flap procedure," is the continuance of the same endeavor. The following case presents a cost-effective single-step technique to correct multiple mucogingival problems at the same time with less morbidity to donor tissues and also evaluates the corrections gained by this bridge flap procedure.

**KEYWORDS:** Bridge Flap Procedure, Mucogingival Surgeries, Multiple Teeth Recession, Shallow Vestibule

## INTRODUCTION

There is no doubt that surgical treatment of gingival recessions is one of the most challenging tasks in periodontal treatment. Gingival recessions are always linked with atrophy of alveolar bone. Therefore it is important to achieve a very close connection between the root surface and the gingiva. Frequently one can observe denudations of root surfaces together with a flat vestibule, abnormal attachment of frenum and a narrow zone of attached gingiva.<sup>1</sup>

Although many techniques have been developed and tried for treating isolated gingival recession with a reasonable extent of success, gingival recession involving many teeth has always remained the actual problem. The countless surgical approaches as reported in the literature for multiple root coverage are few and they include free gingival graft, free connective tissue graft, coronally advanced flap, combination of connective tissue grafting with coronally positioned flap. The combination of connective tissue graft with coronally advanced flap has been shown to demonstrate highest achievement level. All techniques listed above resulted in two surgical site except coronally advanced flap. On the other hand, E.Marggraf<sup>1</sup> presented a one-step surgical procedure which was described as "Double Lateral Bridging Flap",

for coverage of multiple denuded root surfaces. It is a combination of coronally repositioned flap and vestibule extension procedure.<sup>2</sup>

This article presents a case treated by the bridge flap technique.

## CASE REPORT

A 35 year old male patient reported to the Department of Periodontology with the chief complaint of hypersensitivity in relation to lower anteriors. On examination, the patient had Millers Class III recession in relation to 31, 32, 41, 42, region along with a shallow vestibule [Fig.1]. Patient was in good health and gave no history of any systemic ailment. Various clinical parameters were recorded with a UNC-15 periodontal probe:

- Probing pocket depth (PPD)
- Gingival recession (GR), by measuring the distance between the cement-enamel junction (CEJ) and the free gingival margin
- Width of the attached gingiva, by determining the distance from the base of the pocket to the mucogingival junction.

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Fig. 1: Pre operative view

Probing pocket depth of 2mm is present on teeth (31), (41) and 1mm on teeth (32),(42). Gingival recession was 3.5mm with (31), 2mm with (32), 8mm with (41) and 5mm with (42). The width of attached gingiva was 5mm with (31), (32) and 4mm with (41), (42).

The parameters were recorded before and after surgery. The surgical procedure was described to the patient, and informed consent was obtained. Preparation of the case involved full mouth scaling-root planning and meticulous oral hygiene practice.

## SURGICAL TECHNIQUE

The surgical procedure included the bridge flap technique as first introduced by Marggraf<sup>1</sup> and later on modified by Romanos. The technique comprised of an arch-shaped incision in the vestibule at approximately  $2 \times GR + 2$  mm from the gingival margin. This is necessary in order to produce a sufficiently wide bridging flap, ensuring a sufficient blood supply. An incision into the periosteum was placed at its base, and the bone was exposed so that scar formation can take place. By giving a sulcular incision, a split-thickness flap was elevated in the apicocoronal direction joining it with the first incision such that the whole bridge flap was elevated and repositioned coronally covering the denuded root surfaces [Fig. 2&3]. This repositioned flap was then pressed for 3 minutes and independent sling sutures were placed [Fig.4]. Periodontal pack was applied on the operative area covering the exposed bone [Fig.5]. Antibiotics and analgesics were prescribed, and necessary instructions given. Suture was removed on the 10<sup>th</sup> day of the surgery and patient was asked to maintain meticulous oral hygiene. Case was followed up to 6 months [Fig.6].



Fig. 2: Sulcular incision



Fig. 3: Whole bridge flap repositioned coronally



Fig. 4: Sutures placed



Fig. 5 Periodontal pack applied



Fig. 6: 6 months post operative

## RESULTS

Examination of the surgical site 6 months after the surgery showed significant root coverage and an increase in the depth of vestibule and gain in the width of attached gingiva. Gingival recession reduced from 3.5mm to 2mm on teeth (31), 2mm to 1mm on (32), 8mm to 3mm on (41)

and from 5mm to 3mm on (42). A gain in the width of attached gingiva from 5mm to 7mm on teeth (31), (32) and from 4mm to 6mm on teeth (41) and (42) was attained.

## DISCUSSION

Soft tissue recession, defined as exposure of the root surface caused by an apical shift of the gingival margin, results in root hypersensitivity, unaesthetic appearance as well as root caries. The correction of gingival recessions is an important issue in the field of periodontal plastic surgery.<sup>3</sup> Because esthetic concerns are the main indications for root coverage, selection of the most appropriate soft tissue grafting procedure must be done cautiously.<sup>4</sup> In the mid-80s and late 90s, the periodontal literature presented various techniques such as pedicle flaps, free gingival graft, subepithelial connective tissue graft, acellular dermal matrix graft, and guided tissue regeneration to cover denuded root surface.<sup>5</sup>

While reviewing the literature, there were a number of articles addressing mucogingival problems and their surgical solutions. However, an unanswered argument still exists in the literature regarding the adequate width of attached gingiva for periodontal health maintenance, and the existing opinion suggests that the regions with <2 mm attached gingiva and thin gingival biotypes are at increased risk of gingival recession even if it is possible to maintain the gingival health in the areas with absent or insufficient attached gingiva. And so, mucogingival therapy should be advocated for gingival augmentation and to create adequate vestibular depth in areas with insufficient attached gingiva.<sup>6</sup>

The bridge flap technique consists of two surgical techniques concurrently. In this procedure, the flap covering the denuded root surface is supplied by plasmatic circulation from capillaries in the adjacent portion of the gingiva, permitting it to survive. The flap creates a functional, healthy and esthetic result that seems to be resistant to additional gingival recession. The bridge flap technique is indicated when a single surgical procedure is desired to predictably cover the denuded root surfaces, in circumstances where inadequate keratinized gingiva is offered, and also to increase the vestibular depth along with a gain in the width of attached gingiva in one step.<sup>7</sup>

Previous studies done by E. Marggraf reported that recession is reduced by the simultaneous extension of the vestibule. No alveolar bone is left exposed, and, therefore rapid healing is accomplished. The main advantage of this procedure is that it does not require a second surgical site. On the other hand, the functional widening of the attached gingiva is also achieved.<sup>2</sup>

An evaluation of adequate width of the attached gingiva in patients with multiple gingival recessions is an important factor for deciding on any procedure for root coverage. To accomplish optimal esthetic outcome, the gingival form, tooth anatomy, and the correlation of the

underlying bone to the cemento-enamel junction must be completely understood. Accurate determination of the position of cemento-enamel junction and mucogingival junction prior to periodontal surgery and precise placement of incisions are a must in order to accomplish this goal. The amount of attached gingiva needs to be measured as a part of the assessment. It has been made known that to maintain periodontal healthiness there should be 2-3 mm of attached gingiva. In the present case, vestibular deepening was included as treatment of choice to increase the inadequate vestibular depth in order to maintain the periodontal health and root coverage with coronally advanced flap was done to improve postoperative esthetics of the patient. The patient was examined every week to ensure good oral hygiene in the operated area and was enrolled for supportive periodontal maintenance for 6 months. Postoperative esthetic outcome was satisfactory for the patient. The secondary outcome variable such as reduced root sensitivity was achieved. Clinical results 6 months postoperatively were favorable with no recurrence. Conversely, when a significant loss of the periodontal attachment apparatus and osseous structure ensues, the long-term prognosis becomes poor. Treatment approaches used in the present case suggests that combination of two surgical modalities can be successful for the management of multiple teeth recessions.<sup>7</sup>

## CONCLUSION

Successful treatment of multiple recessions is based on the use of predictable periodontal plastic surgical techniques. Appropriate case selection and careful preoperative diagnosis are the prerequisites for improving surgical success. Multiple gingival recession is linked to different etiologies, which should be carefully diagnosed prior to the treatment. The bridge flap method may be used for successful management of multiple teeth recessions.

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