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## Double lateral sliding bridge flap for the coverage of denuded roots: two case reports



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Root coverage has become an important aspect of periodontal plastic surgery. It is a challenge in the presence of a high frenal pull and inadequate attached gingiva. This article reports two such cases of gingival recession, which have been treated with double lateral sliding bridge flaps. The main advantages of this technique are that it doesn't require a separate frenectomy procedure and it can be used to cover multiple gingival recession defects, without a second surgical site. The two treated cases demonstrated adequate root coverage and increase in width of the attached gingiva at 6 months follow-up.

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### ■ Introduction

Gingival recession is the exposure of the root surface by an apical shift in the position of the gingiva<sup>1</sup>. Soft tissue recession, mainly affecting the buccal root surfaces, is a fairly common feature in populations having a high standard of oral hygiene. Besides plaque-induced periodontal inflammation, tooth-brushing trauma is considered a major factor in determining this phenomenon. Tooth malposition, alveolar bone dehiscence, high frenal attachment and iatrogenic factors have also been associated with the development of soft tissue recession.

Marginal tissue recession results in dental hypersensitivity, aesthetic complaints and a tendency for root caries. Therefore root coverage procedures have become an important part of regenerative periodontal therapy. Denudations of root surfaces together with a shallow vestibule and high frenal attachment are observed quite frequently. Regarding the width of the attached gingiva, there are controversial views.

Bowers in 1963<sup>2</sup> stated that it is possible to maintain a clinically healthy gingiva despite a narrow zone of attached gingiva, i.e. < 1 mm. Ainamo and Löe<sup>3</sup> found that in patients with different degrees of reces-



sion, the width of the attached gingiva was more or less the same. Lang and Löe<sup>4</sup> showed in a clinical study that in areas with < 2 mm of keratinised gingiva, inflammation persisted irrespective of effective oral hygiene. They suggested that 2 mm of keratinised gingiva were adequate to maintain clinical health.

Another study by Lindhe and Nyman<sup>5</sup> showed that careful tooth brushing performed daily, monitored for 10–11 years, combined with mechanical cleaning and polishing of the teeth did not produce further recession of the gingival margin whether or not the gingiva was keratinised.

The conclusion drawn from these studies is that gingival health can be maintained independent of its dimensions<sup>6</sup>. The double lateral sliding bridge flap technique was originally proposed by Marggraf<sup>7</sup> to cover gingival recession and to extend the gingiva in a one-step procedure. This technique utilises a combination of a coronally advanced flap and the modified Edlan and Mejchar technique. The advantages of this technique are that it doesn't require a second surgical site, as in free soft tissue grafting procedures, and a separate frenectomy procedure. This article reports two cases treated with this technique.

## ■ Case reports

Two patients with the complaint of recession and hypersensitivity were examined and various clinical parameters were recorded with a William's periodontal probe.

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

The parameters were recorded before and after surgery. The surgical procedure was explained to the patient and informed consent was obtained. Preparation of the patient included scaling and root planing of the entire dentition, and oral hygiene instructions.

## ■ Clinical presentation

### ■ Case 1 (Figs 1 to 6)

Intraoral examination of the 23-year-old male patient (Fig 1) revealed the following: Miller's class I gingival recession of 2 mm was present on teeth 24(31) and 25(41) and Miller's class II gingival recession of 4 mm was present on teeth 23(32) and 26(42). Also, a high frenal attachment was present on teeth 24(31) and 25(41). The width of the attached gingiva was 3 mm on teeth 24(31) and 25(41) and 2 mm on teeth 23(32) and 26(42). A PPD of 2 mm was present on teeth 23(32) and 26(42).

### ■ Case 2 (Figs 7 to 9)

Intraoral examination of a 30-year-old female patient (Fig 7) revealed the following: Miller's class III gingival recession of 3 mm was present on tooth 24(31) and 5 mm on tooth 25(41). The width of the attached gingiva was 3 mm on tooth 24(31) and 5 mm on tooth 25(41). A PPD of 2 mm was present on teeth 24(31) and 25(41).

## ■ Surgical technique<sup>8</sup>

The bridge flap technique is a combination of the coronally repositioned flap and a modified vestibuloplasty procedure by Edlan and Mejchar<sup>9</sup>.

- The first incision is arch shaped with a distance to the vestibule of approximately  $2 \times GR + 2$  mm. This is necessary in order to produce a sufficiently wide bridging flap, ensuring a sufficient blood supply.
- A split thickness flap is elevated in a coronal direction and an incision into the periosteum is placed at its base.
- This flap is elevated in a coronal direction after a sulcular incision.
- The whole bridge flap is coronally repositioned (Figs 2, 3 and 8) to cover the denuded root surface and pressed to the alveolar bone for at least 3 minutes to avoid haematoma.

Both patients were given antibiotics (amoxicillin 250 mg every 8 hours for 5 days) and analgesics (a combination of ibuprofen 400 mg and paraceta-



Fig 1 Preoperative view.



Fig 2 Bridge flap elevated and coronally positioned.



Fig 3 Bridge flap coronally positioned and sutured.



Fig 4 Periodontal pack placed.



Fig 5 10 days post-operative view.



Fig 6 6 months post-operative view.

mol 500 mg twice-daily for 3 days) and post-operative instructions were given. Antibiotics were prescribed to control any post-operative infections. Chlorhexidine mouthwash (0.2%) was prescribed

for 4 weeks after surgery. A periodontal pack was placed on the operative site (Fig 4). The donor area was left to granulate and heal by secondary intention after the flap was coronally positioned.



**Figs 7 to 9** Stepwise surgery of case 2.



**Fig 7** Preoperative view.



**Fig 8** Operative view.



**Fig 9** 6 months post-operative view.

(Figs 5, 6 and 9). The patients did not have any post-operative morbidity.

Both patients were recalled for post-operative examination on the 180th day. In both cases, complete root coverage was achieved. In case 1, the width of the attached gingiva increased from 3 mm to 7 mm on teeth 24(31) and 25(41) and from 2 mm to 6 mm on teeth 23(32) and 26(42). A PPD of 2 mm was present on teeth 23(32) and 26(42). In case 2, the width of the attached gingiva increased from 3 mm to 6 mm on tooth 24(31) and from 1 mm to 6 mm on tooth 25(41). A PPD of 2 mm was present on teeth 24(31) and 25(41). The patients were instructed to use a soft toothbrush for mechanical plaque control in the surgical area by a coronally directed roll technique.

■ **Discussion**

Several procedures have been proposed to cover gingival recessions. Marggraf<sup>7</sup> presented a surgical procedure, namely the double lateral sliding bridge flap technique, which is an Edlan-Mejchar technique combined with a coronally repositioned bridging flap.

In the original Edlan-Mejchar technique<sup>9</sup>, which was developed to deepen the vestibule and not to cover gingival recessions, there was alveolar bone exposure. But in this modification there is no alveolar bone exposure. This could explain the uncomplicated and rapid healing in most cases. Also, in this technique, a coronally repositioned flap (CRF) could be used for root coverage even in the presence of an attached gingival width of less than 3 mm<sup>10</sup>.

Furthermore, with this technique, the incidence of recurrent recession is reduced considerably by the simultaneous extension of the vestibule, as the mucosal flap cannot be influenced by tension from an apical direction.

Scientific data obtained from well-controlled clinical and experimental studies have unequivocally demonstrated that the apico-coronal width of the gingiva and the presence of an attached portion of gingiva are not of decisive importance for the maintenance of gingival health and height of the periodontal tissues. Consequently, the presence of a narrow zone of gingiva in itself cannot justify surgical intervention<sup>11</sup>. Although increasing the band of

■ **Healing**

The sutures were removed 10 days after the procedure. The surgical site was examined for uneventful healing. In both the cases, there were no post-operative complications and healing was satisfactory



attached gingiva is not the main aim of this technique, this was also achieved from the treatment.

In both the cases, complete root coverage as defined by Miller<sup>12</sup> was achieved. Miller defined complete root coverage in clinical terms as location of soft tissue margin at the CEJ, presence of clinical attachment to the root, a sulcus depth of 2 mm or less and absence of bleeding on probing.

The other advantages of this technique are that by releasing the periosteal fibres, the frenal pull also can be relieved, as seen in Case 1. Therefore, there is no necessity for a separate frenectomy procedure. Also, as seen in this case, this technique can be used to cover multiple recessions. Even in the presence of a narrow width of attached gingiva, a high level of root coverage was achieved. This was in accordance with the study done by Romanos et al<sup>8</sup>.

In Case 2, it can be seen that the midline diastema did not affect the post-operative result, unlike other pedicle graft procedures where the interdental bone level has to be considered during case selection. In these cases, neither the quantity of gingival recession, nor the quality of the supporting tissues affected the success of this technique. This observation is supported by two human studies which showed that the absence of a narrow band of keratinised gingiva did not interfere with gingivectomy/flap surgery results<sup>13,14</sup>.

Also, some of the technical aspects described during the procedure were key to its success. The initial semilunar incision was at least  $2 \times GR + 2$  mm apical to the gingival recession and this provided a wide flap<sup>8</sup>.

The results of the present case reports are consistent with the previous studies done by Romanos et al<sup>8</sup> and Marggraf<sup>7</sup>, who found 70% coverage even after a follow-up period of 5–8 years. This technique resulted in the development of keratinised epithelium of the transposed alveolar mucosa. According to the study by Bokan<sup>15</sup>, the possible sources of keratinisation of the underlying tissues are the remnants of the attached gingiva left on the flap margin after the paramarginal incision, the retained de-epithelialised gingival tissue and the periodontal ligament.

## ■ Conclusions

In both treated cases, the double lateral sliding bridge flap technique was successful in treating gingival recession in the presence of high frenal pull and shallow vestibule and the outcome was dependent on the careful performance of the operation.

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