

MUCOGINGIVAL SURGERY WITH FREE GINGIVAL GRAFT (STRIP TECHNIQUE) FOR AUGMENTATION OF THE ATTACHED GINGIVAL TISSUES: REPORT OF THREE CASES

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ABSTRACT

BACKGROUND: The treatment of the mucogingival problems is one of the main objectives of the periodontal therapy. The insufficient or absent attached gingiva increases the risk of development of gingival recessions. The classical grafting procedures cannot offer a solution for coverage of a larger than 3 teeth recipient area. The strip technique for free gingival graft avoids the limitations of the palatal donor area and decreases the number of surgical procedures required for augmentation of the attached gingival tissues.

METHOD: Three patients with Miller class II, III and IV gingival recessions and small vestibule depth in the frontal mandibular region were selected for treatment. On each patient a strip free gingival graft technique, which included a longitudinal division of the donor palatal tissue, was performed.

RESULTS: The initial healing completed in two weeks without complications except the discomfort from the donor area. The augmentation of the attached gingival tissues using the strip free gingival graft technique led to significant gain (4,33 mm mean gain) of attached gingival in the treated regions.

CONCLUSION: The limitations of the apical mucosal lap displacement for preparation of recipient site in situations with inadequate vestibule depth and small alveolar bone height require a graft with small width. The results from the presented case reports with application of the strip technique for free gingival graft indicate that it could be applied when augmentation of the attached gingival tissues on larger area (more than 3 teeth).

Key words: attached gingival tissues, muco-gingival problem, free gingival graft, strip technique

Some of the most important functional goals in the treatment of mucogingival problems are arresting the progression of gingival recession and improving the ability for plaque control in cases with healthy and disease marginal tissues. Lang & Löe (1972) (12) suggested that 2 mm of

gingiva is an adequate width for maintaining gingival health. Findings reported by Miyasato et al. (1977) (15) and Grevers (1977) (8) on the other hand, failed to support the concept of a required minimum dimension of gingiva. In the later studies of Wennström & Lindhe (1983a,b) (28,29) in the beagle dog model is demonstrated that dentogingival units with mobile gingiva develops more pronounced signs of gingival inflammation when bacterial plaque was allowed to accumulate.

The contemporary opinion is that even if it's possible to maintain the gingival health in the areas with insufficient or absent attached gingiva, the regions with less than 2mm attached gingival tissues and the gingival tissue is thin are at increased risk of gingival recessions. Proper mucogingival therapy should lead to gingival augmentation and create a vestibule with adequate depth in the regions with insufficient attached gingival tissues (1, 13, 14, 18, 20, 22).

Multiple gingival augmentation techniques with different success are described in the literature (1, 2, 4, 6, 7, 13, 16, 17, 18, 19, 20, 22, 24, 30). Free gingival graft technique is considered to be the most efficient in regions with lack of attached gingival tissues and in cases with orthodontic treatment or restorations with subgingival preparations (13, 18, 22, 30). The technique includes a preparation of a recipient bed with initial horizontal incision along the mucogingival line and apically repositioned split flap fixed with periosteal sutures. The free gingival graft is usually taken from the palatal area (13). The main disadvantages of this technique are the presence of two wound areas, the unfavorable color match, the rough texture of the graft (5), and the limitations connected with the extent of the donor area which restricts the area of gingival augmentation to three, max. four teeth.

In cases with wider regions with absence of attached gingiva, techniques aiming to surmount limitations of the conventional palatal donor area are recommended: Mesh graft (accordion) technique (Rateitschak & al. (21,30)), Strip technique (Han & al.(9)) and Vertical strip technique (Khoshkhoonejad & al. (11)).

In the presented cases is a Strip technique is applied. The procedure includes a classical preparation of the recipient area. A wider gingival graft (7-9 mm) is taken from the palatal donor area. The graft is divided longitudinally in two equal parts afterwards. The two obtained grafts are placed and fixed on the recipient area. A hard periodontal dressing is placed. The dressing and the sutures are removed day 10-14.

CASE 1:

S.N. - 55 years old patient with Miller class III recessions in the frontal mandibular region and small vestibule height. The patient had ineffective oral hygiene due to the limitations of the tooth brush placement in the area which has led to poor control of the gingival inflammation (PBI: 2,17 severity, 100% extent). A gingival augmentation procedure was necessary to stop the progression of the recessions and to increase the vestibule depth in order to improve the effectiveness of the oral hygiene procedures.

INITIAL STATUS:

Tooth	43	42	41	31	32	33
PD	3	3	2	2	2	3
CAL	5	7	6	7	7	6
Attached gingiva	1,5	0	0	1	0	2



Fig. 1.

TREATMENT:

A free gingival graft with strip technique was chosen to obtain augmentation of the gingiva and increase of the vestibule depth on the whole frontal area. The recipient area was prepared with a split thickness flap which was fixed apical with periosteal sutures. The donor palatal tissue was divided longitudinally and fixed in the recipient area and covered with hard periodontal dressing.



Fig. 2, 3, 4, 5

RESULT:

Four months after surgery a significant gain (3,67 mm mean gain) of attached gingiva was measured. The achieved increase of the vestibule depth led to improvement of the effectiveness of the oral hygiene and to better control of the gingival inflammation (29% sites with BoP). The slight reduction of the PD that was measured is a result of gingival retraction, because the CAL remained unchanged.

Tooth	43	42	41	31	32	33
PD	2	2	2	2	2	3
CAL	5	7	6	7	7	6
Attached gingiva	4	5	5	5	3	4,5
Gain of attached gingiva	2,5	5	5	4	3	2,5



Fig. 6.

CASE 2:

S.K. - 51 years old patient came with complains of pain and increased teeth mobility in the frontal mandibular region. The examination revealed a second grade teeth mobility and periodontal abscess of the #31, #41. A complex mucogingival problem consisting of papilla-penetrating frenulum, Miller class IV recession and lack of attached gingiva was also detected. The initial periodontal therapy included mechanical therapy (scaling and root planning (SRP)) combined with adjunctive systemic administration of Amoxicillin 500mg and Metronidazole 250mg t.i.d for 7 days. A ribbon-reinforced composite splint on teeth #33, #32, #31, #41, #42, #43 was made to stabilize the teeth. A gingival graft procedure was planned to improve plaque control in better periodontal environment and thus to increase the chance to maintain the functional stability of the mandibular incisors.

INITIAL STATUS:

Tooth	43	42	41	31	32	33
PD	2.0	2.0	2.0	3.0	2.0	1.0
CAL	2	4	7	7	1.0	0.0
Attached gingiva	1	1	0	0	2	2



Fig. 7.

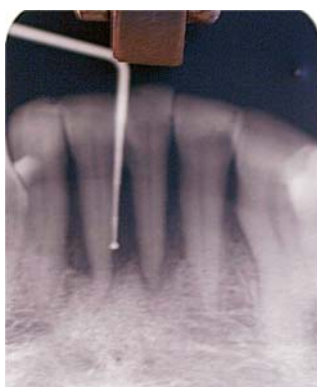


Fig. 8.

TREATMENT:

The free gingival graft technique is preferred in similar situations with absence of attached gingiva. The small height of the alveolar bone in the region determines the limitation of the apical displacement of the flap during the preparation of the recipient site. That indicates the split free gingival graft technique for most appropriate in this situation because the covering of the whole frontal region is achieved with only one donor area. The preparation of the recipient and donor areas and the fixation of the graft were similar with case 1.

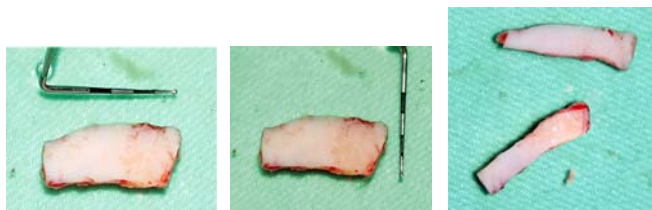


Fig. 9, 10, 11, 12

RESULT:

A significant gain (3,83 mm mean gain) of attached gingival tissues was also detected four months after surgery. Bone regeneration and new interdental papilla formation was observed in area #31, #41 which led to improvement of the marginal gingival outline. The increase of the vestibule depth and the new apical position of labial frenulum achieved after this procedure led to improvement of the mucogingival relationships, better opportunity for plaque control and better long-time prognosis for the mandibular incisors.

Tooth	43	42	41	31	32	33
PD	1.0	1.0	1.0	1.0	2.0	1.0
CAL	1.0	3.0	5.0	6.0	1.0	0.0
Attached gingiva	4.0	5.0	4.5	4.5	6.0	5.0
Gain of attached gingiva	3.0	4.0	4.5	4.5	4.0	3.0



Fig. 13.



Fig. 15.



Fig. 14.

CASE 3:

E.D. - 35 year's old patient came with complains of discomfort and pain from cold irritations in the frontal mandibular region. The clinical examination revealed a moderate gingival inflammation (PBI=1,47 severity, 60% extent) and insufficient gingival tissues in the frontal region. The patient informs that a procedure for lower lip frenulectomy was performed before one year, but she has observed a progression of frontal mandibular gingival recessions. The treatment began with mechanical therapy for elimination of the gingival inflammation and improvement of the personal oral hygiene. A free gingival graft procedure was planned as a first step of a Bernimoulin (4) technique for root coverage.

INITIAL STATUS:

Tooth	43	42	41	31	32	33
PD	0.5	0.5	1.0	0.5	0.5	1.0
CAL	1.0	2.0	2.0	2.5	2.0	0.0
Attached gingiva	0,5	0.0	0,5	0,5	1.0	1.0

TREATMENT:

A strip technique was preferred in order to spare one surgical procedure by achieving a gingival augmentation on the whole frontal mandibular area with one graft. After preparation of the recipient site in the area of #33, #32, #31, #41, #42 and #43, a tissue graft approximately 1,5 mm thick, 8mm wide and 16mm long was taken from the palatal bicuspid region. The graft was divided longitudinally in two parts each 4mm/16mm in size. The two obtained grafts were fixed in the recipient site- one in the area of #33, #32, 31, and the other in the area of #41, #42, #43.

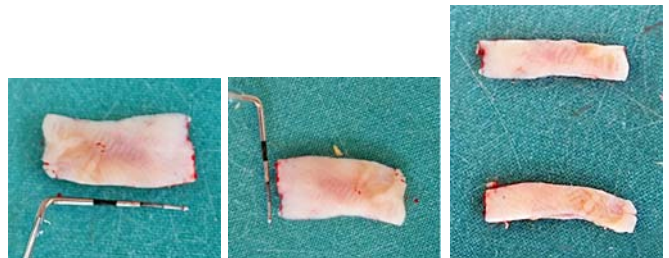


Fig. 16, 17, 18, 19.

RESULT:

The reevaluation four months after the procedure presents a sufficient gain (5,5 mm mean gain) of attached gingival tissues which significantly improves the prognosis of the area. The achieved amount of attached gingiva is enough to stop the progression of the gingival recessions and to allow a successful root coverage with coronally repositioned periodontal flap as a second stage of the chosen surgical technique.

Tooth	43	42	41	31	32	33
PD	0.5	0.5	0.5	0.5	0.5	0.5
CAL	1.0	2.0	1.5	2.5	2.0	0.0
Attached gingiva	5,5	5	7	6	6	7
Gain of attached gingiva	5	5	6,5	5,5	5	6



Fig. 20.

Several techniques are developed to achieve gingival augmentation in situations with generalized insufficiency or absence of attached gingiva. Despite the fact that the Mesh graft (accordion) technique, and Vertical strip technique leave areas without any grafts coverage between the grafts, the uncovered areas are finally covered with keratinized epithelium regardless to their alveolar mucosa type.

The contemporary studies (3,23,25,26,27) present that the thickness of the gingiva is of great importance for the resistance of the gingival tissues. By the application of techniques that leave uncovered recipient area, remains the risk of formation of zones with insufficient thickness of the tissue between the grafts. The applied in the presented cases strip technique allows the complete coverage of the recipient area with the gingival grafts and diminishes the risk of insufficient width and thickness of the gained attached gingival tissues.

CONCLUSION:

In the limitations of the presented cases, the results from the application of the strip technique for free gingival graft indicate that this procedure could be applied when augmentation of the attached gingival tissues on larger area (more than 3 teeth) in necessary. This method is indicated especially in situations with inadequate vestibule depth and small alveolar bone height. Because of the limitations of the apical mucosal lap displacement for preparation of recipient site in such anatomical circumstances, a graft with small width is indicated. The dividing of the palatal gingival in two parts allows covering of wider recipient site and reduces the morbidity of the classical technique for gingival augmentation by diminishing the number of procedures in situations with generalized lack of keratinized tissues.

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