

Treatment of Gingival Recession with Hypersensitivity Using Free Soft-Tissue Graft Procedures

Denislav K. Emilov¹, Elitsa G. Deliverska-Aleksandrova²

¹ Department of Periodontology, Faculty of Dental Medicine, Medical University of Sofia, Sofia, Bulgaria

² Department of Dental, Oral, and Maxillofacial Surgery, Faculty of Dental Medicine, Medical University of Sofia, Sofia, Bulgaria

Corresponding author: Denislav Emilov, Department of Periodontology, Faculty of Dental Medicine, Medical University of Sofia, Sofia, Bulgaria;
Email: d.emilov@fdm.mu-sofia.bg; Tel.: +359 898 462 093

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Abstract

Introduction: The main goal of root coverage procedure is complete coverage of the recession defect with good esthetic results related to the adjacent soft tissues and minimal probing depth after the healing process.

Aim: The aim of this study was to compare the efficiency of surgical and nonsurgical treatment options in patients with gingival recession and dentin hypersensitivity.

Materials and methods: Sixty patients with gingival recession Miller Class I and II with hypersensitivity and esthetic concerns were included. Of these, 30 patients were treated with free soft-tissue graft procedures and 30 people as controls were treated with anti-hypersensitivity gel. The surgically treated patients were allocated into two groups: 20 of them with coronally advanced flap with subepithelial connective tissue graft and 10 with free gingival graft.

Results: We achieved full coverage on the exposed root surfaces in 19 patients treated with coronally advanced flap and de-epithelized graft and partial root coverage in one of them.

Patients treated with free gingival graft procedure achieved full root coverage in 7 of them and partial in 3 of them (gingival recession = 1 mm after surgery). The surgical treatment allowed resolution of the esthetic issues of patients and elimination or reduction of the dentin hypersensitivity. In the control group, there was partial elimination of root sensitivity.

Conclusions: In the surgically treated group with both techniques, we achieved resolution of dentin hypersensitivity and coverage of the root surface with healthy keratinized tissues. These techniques can be considered as treatment options for dentin hypersensitivity depending on the indications.

Keywords

coronally advanced flap, free gingival graft, gingival recession, root sensitivity

INTRODUCTION

Primary causes of gingival recessions are mainly faulty tooth brushing, abnormal frenum attachment, tooth mal-

positioning, deficiency of keratinized gingiva, improper restorations, and aging. Gingival recessions (GR) may cause hypersensitivity, root caries, and impaired esthetic concerns. Efforts should be made to achieve complete root coverage for improved esthetics and reduction of dentin

hypersensitivity (DH). Different types of modalities have been used to treat gingival recession including displaced flaps, free gingival graft, connective tissue graft, APRF, IPRF, different types of barrier membranes and combination of different techniques. Success of mucogingival surgical interventions depends on different factors as bacterial contamination, defect morphology, parafunctions, tooth position, tooth surface characteristics as well as the choice of surgical technique. Benefits of microsurgical approaches in addition to non-surgical treatment of GR with DH have been described in different studies.^[1]

AIM

The aim of this study was to compare the efficiency of surgical (free graft techniques) and nonsurgical treatment options in patients with gingival recession and dentin hypersensitivity (DH).

MATERIALS AND METHODS

The present study included 60 patients (Table 1) with gingival recession Miller Class I and II with hypersensitivity and esthetic concerns. Thirty of them were treated with free soft-tissue graft procedures and 30 patients received nonsurgical treatment with anti-hypersensitivity gel. The surgically treated patients were allocated into two groups: 20 of them had coronally advanced flap with sub-epithelial connective tissue graft using bilaminar technique (16 with single and 4 with multiple recession defects) and 10 of them with free gingival graft on a single gingival recession with no loss of papilla and interdental bone adjacent to the exposed root surface. Surgeries were performed by one investigator.

- Group A – surgically treated group
 - subgroup A – coronally advanced flap with subepithelial connective tissue graft (20 cases).
 - subgroup B – free gingival epithelium graft (10 cases).
- Group B – non-surgically treated/control group - 30 cases (anti-hypersensitivity gel Sensigel, which was applied every week on a dried surface for 2 minutes for 1 month)

Table 1. Patients with gingival recession and DH

	Surgically treated group	Control group
Men	14	12
Women	16	18
Average age	32	37
Miller Class I (patients)	22	20
Miller Class II (patients)	8	10

Patient selection:

- Patients without contraindication for surgical treatment;
- Patients without periodontal disease (generalized or localized periodontitis, gingivitis);
- Patients with normal interdental papilla;
- Miller Class I or Miller Class II gingival recession with root dentine sensitivity (RDS);
- Patients did not take NSAIDs or antibiotics recently.

RESULTS

We achieved full coverage on the exposed root surfaces of 18 patients treated with coronally advanced flap and de-epithelized graft (Group A, subgroup A). Two of them had partial root coverage. This procedure led to resolution of the esthetic issues of the patients and elimination of the root sensitivity. Two with the partial coverage had a high reduction of the hypersensitivity.

Patients treated with free gingival graft procedure (Group A, subgroup B) achieved full root coverage on 6 of them and partial on 4 of them (GR = 1 mm after surgery) (Figs 1, 2). Contrary to the results from the other technique, all 10 patients had complete resolution of the dentin hypersensitivity and had no positive stimuli test compared to that before surgery. In the control group (group B) there was partial elimination of root sensitivity.

The results of this study showed significant reduction of gingival recession and dentin hypersensitivity, with concomitant attachment gain following surgical treatment.

The results of this study showed significant reduction of gingival recession with concomitant attachment gain following surgical treatment.

Before the procedure in the test group (surgically treated patients) 18 of patients reported having severe pain and 12 - moderate. In the control group, four of the patients had severe pain and 22 - moderate pain (Fig. 3).

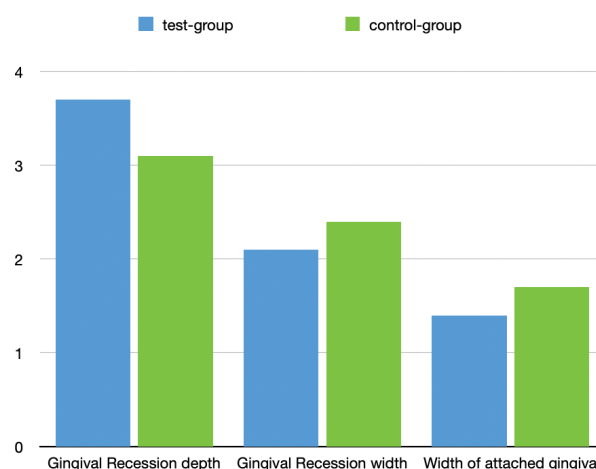


Figure 1. Measurements of gingival recession and attached gingiva in mm before the procedure.

Two months after the surgery, 6 patients reported having moderate pain and 24 were without any pain. In the control group, 4 patients reported having severe pain, 22 with moderate pain and 4 were without pain (Fig. 4).

Both surgical techniques showed the highest percentage gain in coverage of recession depth as well as gain in

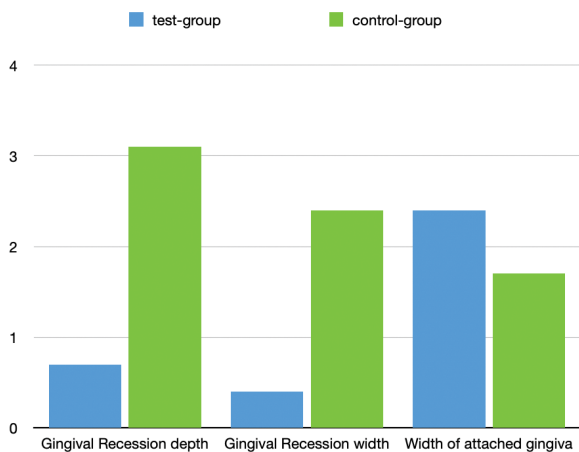


Figure 2. Measurements of gingival recession and attached gingiva in mm 2 months after the procedure.

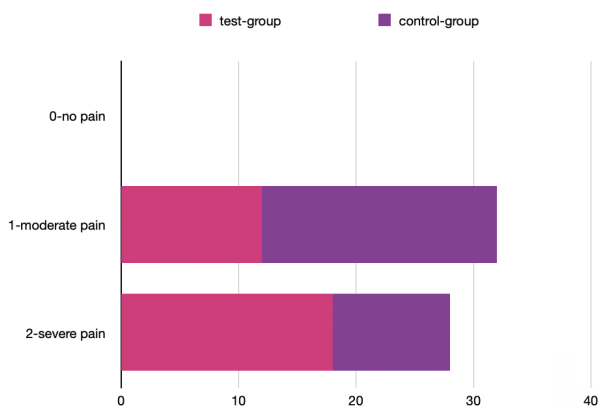


Figure 3. Assessment of root hypersensitivity in both groups before the procedure.

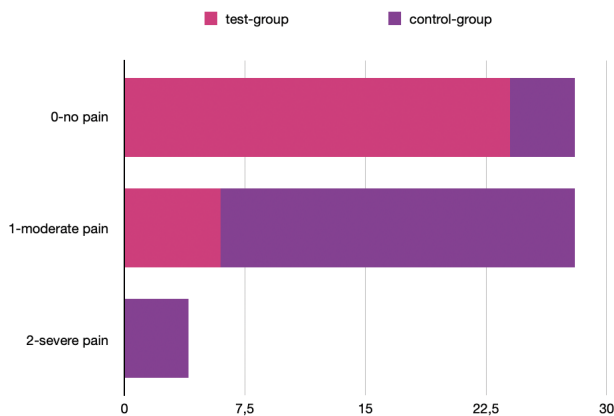


Figure 4. Assessment of root hypersensitivity in both groups two months after treatment.

keratinized gingiva and reduction of hypersensitivity. In the control group (group B), there was partial elimination of root sensitivity without any root coverage or augmentation of attached gingiva.

DISCUSSION

The main goal of periodontal surgery is to improve the periodontal health of patients and maintain their functional dentition throughout their whole lives. Esthetic concerns are nowadays an inseparable part of dental therapy. Gingival defect may cause hypersensitivity, impaired esthetics, and root caries. Many periodontal plastic surgery techniques have been proposed to allow the coverage of exposed roots.^[2]

Treatment of gingival recessions with surgical procedures depends on several factors: the size of the defect, bone loss, presence or absence of keratinized tissue adjacent to the defect, and the thickness of gingiva, which are related to the defect and/or patient.^[3] The aim of patient centred outcome treatment is to improve esthetics and other related problems such as dentin hypersensitivity and every effort should be made to achieve complete root coverage.^[3]

To clarify the definition of complete root coverage, Miller^[4] included the following additional criteria:

1. The soft tissue margin must be located at the cemento-enamel junction.
2. There is a clinical attachment to the root.
3. The sulcus depth is no more than 2 mm.
4. There is no bleeding on probing.^[5]

The main goal of the root coverage procedure in our study is to achieve complete coverage of the gingival recession with good appearance of adjacent soft tissues and minimal probing depth and reduction of DH. Several surgical procedures such as pedicle flaps, free soft tissue grafts, combinations of pedicle flaps, and grafts or barrier membranes may be indicated to improve the condition.^[6]

Gingival recession should be thoroughly assessed in order to offer the most suitable treatment, especially if patients have hypersensitivity. The treatment options in these patients are able to improve their oral health-related quality of life. In our study, we compared surgical and non-surgical modalities in these patients. Different surgical techniques using free graft procedures were evaluated in cases with gingival recession with hypersensitivity: coverage and assessment of the root sensibility.

Coronally advanced flap nowadays is the first choice of surgical techniques when there is adequate keratinized gingiva apical to the recession defect. It assures optimum root coverage results, good colour blending of the treated area and recuperation of original morphology of the soft tissue margin can be predictably accomplished by this technique. The coronally advanced flap is a very effective technique in treating multiple recession defects affecting adjacent teeth and could be used alone or in combination with soft tissue grafts, acellular dermal matrix, barrier membrane, enamel

matrix derivative, platelet-rich plasma, platelet rich fibrin and living tissue-engineered human fibroblast-derived dermal substitute.^[7-10]

This procedure is based on the coronal shift of the soft tissues on the exposed root surface.

In 1982, Langer et al.^[11] described the subepithelial connective tissue graft technique to augment the edentulous ridge. Later, in 1985, Langer et al.^[12] described the same technique in detail for covering gingival recessions on both single and multiple adjacent teeth. By incorporating the advantages of the pedicle graft such as double blood supply from the overlying flap and periosteal connective tissue bed coupled with the genetic potential of the connective tissue from palate, it is possible to maximize the graft survival which provides excellent esthetics. Although auto grafts have proven predictable when proper technique is used, they have their drawbacks: the donor tissue is usually harvested from hard palate which necessitates an additional surgical procedure. Use of connective tissue grafts in periodontal surgery has been increasing tremendously over the last few years.^[13]

Sanctis et al.^[14] proposed a hypothesis in an attempt to explain the increase of keratinized tissue after connective tissue graft and coronal advancement of flap based on Ainamo and Karring theory. As described by Ainamo, the mucogingival line always regains its original, “genetically determined” position.^[15-18]

A possible benefit following root coverage procedures may be augmentation of keratinized tissue.

Although many comparisons have been made using different surgical approaches, of both coronally advanced flap and the subepithelial connective tissue graft techniques for root coverage.^[19-23] No studies can be found in literature that directly compare these and other techniques. Comprehensive reviews of these techniques clearly indicated that there were no significant differences in efficacy and the reported results showed high variability because of the selection of defects, magnitude of defects, location of recession, mean initial depth, and operator skill.^[23-27]

Our study showed statistically significant reduction of the gingival recession (**Table 2**), with concomitant attachment gain following treatment with all tested surgical techniques, which is supported by other authors.^[24-27]

Table 2. Assessment of root hypersensitivity, root coverage, and augmentation of attached gingiva in both groups

	Test-group	Control-group	P
2 - severe pain	18	4	0.043
1 - moderate pain	12	22	NS
0 - no pain	0	4	NS
Root coverage	30	0	<0.05
Attached gingiva augmentation	30	0	<0.05

Both surgical techniques showed the highest percentage gain in coverage of recession depth as well as gain in keratinized gingiva. In the non-surgical group, there was no satisfying reduction of DH. In our study, we didn't support the use of root modification agents to improve root coverage.

On the basis of this study the following conclusions were made:

1. All surgical techniques produced significant improvements in gingival recession coverage, clinical attachment level, and width of attached gingiva.
2. Free grafts tissue procedures were significantly superior to nonsurgically treated gingival recession in cases with hypersensitivity.

CONCLUSIONS

In the surgically treated group with both techniques, we achieved resolution of dentin hypersensitivity and coverage of the root surface with healthy keratinized tissues. These techniques can be considered as treatment of gingival recession with dentin hypersensitivity depending on the indication for each procedure to achieve root coverage.

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Лечение рецессии десны с гиперчувствительностью с использованием процедур трансплантации мягких тканей

Денислав К. Емилов¹, Елица Г. Деливерска-Александрова²

¹ Кафедра пародонтологии, Факультет дентальной медицины, Медицинский университет – София, София, Болгария

² Кафедра дентальной, оральной и челюстно-лицевой хирургии, Факультет дентальной медицины, Медицинский университет – София, София, Болгария

Адрес для корреспонденции: Денислав К. Емилов, Кафедра пародонтологии, Факультет дентальной медицины, Медицинский университет – София, София, Болгария; Email: d.emilov@fdm.mu-sofia.bg; Тел.: +359 898 462 093

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Резюме

Введение: Основной целью процедуры закрытия корня является полное закрытие дефекта рецессии с хорошими эстетическими результатами в отношении окружающих мягких тканей и минимальной глубиной зондирования после процесса заживления.

Цель: Целью данного исследования было сравнение эффективности хирургических и нехирургических методов лечения у пациентов с рецессией десны и гиперчувствительностью дентина.

Материалы и методы: В исследование были включены 60 пациентов с рецессией десны I и II класса по Miller, гиперчувствительностью и эстетическими проблемами. Из них 30 пациентов лечили процедурами свободной трансплантации мягких тканей, а 30 человек в качестве контрольной группы лечили антигиперчувствительным гелем. Прооперированные больные были разделены на две группы: 20 из них с коронально смещенным лоскутом с субэпителиальным соединительнотканым лоскутом и 10 со свободным десневым лоскутом.

Результаты: Мы добились полного покрытия открытых поверхностей корней у 19 пациентов, пролеченных коронально выдвинутым лоскутом и деэпителизированным трансплантатом, и частичное покрытие корня у одного из них.

Пациенты, пролеченные методом свободной десневой трансплантации, достигли полного закрытия корней у 7 из них и частичного у 3 из них (рецессия десны = 1 мм после операции). Хирургическое лечение позволило решить эстетические проблемы пациентов и устранить или уменьшить гиперчувствительность дентина. В контрольной группе произошло частичное устранение корневой чувствительности.

Заключение: В группе хирургического лечения с использованием обеих методик мы достигли устранения гиперчувствительности дентина и покрытия поверхности корня здоровыми кератинизированными тканями. Эти методики можно рассматривать как варианты лечения гиперчувствительности дентина в зависимости от показаний.

Ключевые слова

коронально выдвинутый лоскут, свободный десневой трансплантат, рецессия десны, чувствительность корня
