

EFFECT OF SMOKING ON THE PERIODONTAL MICROSURGERY TECHNIQUE ON THE TREATMENT OF GINGIVAL RECESSION

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Abstract

This paper aims to evaluate the effects of smoking on periodontal microsurgery technique using the subepithelial connective tissue graft (SCTG) for treatment of gingival recession on smokers. 14 patients nonsmokers and 12 smokers were selected, presenting Miller's Class I and II gingival recession ≥ 2.0 mm. For both groups, the subepithelial connective tissue graft was used with the aid of a surgical microscope. The clinical parameters of width and height of the gingival recession, height and thickness of keratinized tissue, probing depth and clinical attachment level were evaluated before and six months after surgery. At the end of the study, there were obtained an average percentage of 96.66% of root coverage on nonsmokers and 82.49% on smokers ($p=0.03$). Complete root coverage was observed in 78,57% and 50% of patients, respectively. Therapy can benefit both groups, but smokers have less favorable outcomes to root coverage with periodontal microsurgery using the SCTG.

Keywords: Tabacco. Gingival recession. Surgery.

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INTRODUCTION

In addition to acceptable results based on clinical data, periodontal plastic surgery seeks the development of less invasive techniques that promote rapid healing, less postoperative discomfort and greater patient satisfaction. This goal can become more tangible if the surgical microscope is used, since this provides optimal working instrument illumination and magnification of the operating field allowing a more accurate and atraumatic manipulation of tissues, an elaborate coaptation edges of the wound, and as result, a healing by first intention.^(1,2) Moreover, clinical studies⁽³⁻⁸⁾ has shown that smoking negatively influences the rate of root coverage and significantly reduces the possibility of Complete Root Coverage (CRR). Given the above, this study aims to evaluate the levels of root coverage achieved with the technique of periodontal microsurgery with SCTG employed in the treatment of gingival recession in smokers and nonsmokers.

MATERIALS AND METHODS

This is a controlled, parallel and masked clinical study, which included a total of 26 patients, selected from the period between August 2010 and October 2011. Patients were divided into smokers and nonsmokers, with buccal gingival recessions class I and II Miller⁽⁹⁾ and were all treated with root coverage using a subepithelial connective tissue graft with the aid of the operating microscope.

The following inclusion criteria were used: Presence of buccal gingival recessions Class I and II of Miller (≥ 2.0 mm), located in canines or premolars, probing depth (PD) ≤ 3 mm without bleeding on probing, absence of caries, restorations, orthodontic appliances and pulp changes in the areas to be treated and also should present an aesthetic complain and/or hypersensitivity reason indicating the root coverage surgery. All included patients had good general health, absence of contraindications to surgical procedure and did not use drugs that could interfere with periodontal tissue health or healing. About the smoking criteria, were included in the

non-smoking group patients who reported never having smoked and placed in the group of smokers, those who reported greater than or equal to 10 cigarettes per day for at least 5 years consumption. This study was approved by the local research ethics committee EBMSP under number 025/2011 and the patients were selected at the Faculty of Dentistry of the Bahiana School of Medicine and Public Health (EBMSP), Salvador - Bahia and were included in the study protocol after the review of the inclusion/exclusion criteria, careful reading and signing the form consent. Prior to surgical procedures, each participant was enrolled in the plaque control program through oral hygiene instruction (Stillman modified technique), periodontal instrumentation (if required) and coronal polishing.

The clinical measurements were obtained 28 days after the completion of initial therapy and reevaluated 6 months after surgery. All evaluations were performed by the same examiner and quantified using a digital caliper accurate to 0.01 mm.

The clinical parameters evaluated were: height of gingival recession (HGR), height of keratinized tissue (HKT), thickness of keratinized tissue (TKT), width of gingival recession (WGR), probing depth (PD), clinical attachment level (CAL).

Gingival recession of the test groups (smokers) and control (non-smokers) were treated using the same surgical technique, advocated by Tibbetts and Shanelec⁽¹⁾ and modified by Campos et al.⁽¹⁰⁾ with the aid of the operating microscope. All surgeries were performed by a single experienced surgeon (SB).

The analysis was performed using descriptive statistics using tables containing the absolute and relative frequencies and parameters of mean and standard deviation. The data of HGR and WGR variables were analyzed non-parametrically way. Analysis of variance with repeated measures was used for PD, CAL, HKT and TKT (SAS, version 9.1) variables. The analysis of HGR and WGR variables was performed using the Mann-Whitney test for comparisons between groups and the Wilcoxon test for comparisons between times. The %RC was compared by Student's t test for heterogeneous

variances (Bioestat, version 5.0). In all statistical tests we used a significance level of 5 %.

RESULTS

There was homogeneity between groups for the clinical parameters evaluated (CAL, HKT, TKT, PD, HGR and WGR) at baseline. At 6 months, both groups

had improvements in the parameters of CAL, HKT, TKT, HGR and WGR ($p < 0.05$), but there was no intergroup difference. At the end of the study, it was obtained a mean percentage of root coverage of 96.66 % in nonsmokers and 82.49 % in smokers ($p = 0.03$) and complete root coverage was observed in 78.57 % and 50 % of patients, respectively. Table 1 shows the distribution of sites operated in accordance with the %RR obtained.

Table 1. Frequency of root coverage and its distribution among the different percentages of root coverage after 6 months

GROUPS	PERCENTAGE OF ROOT COVERAGE						
	100%	99-90%	89-80%	79-70%	69-60%	59-50%	49-40%
NONSMOKERS (14)	11	0	3	0	0	0	0
SMOKERS (12)	6	0	3	0	0	1	2

DISCUSSION

Results indicated that with adequate plaque control maintainance during the study, periodontal microsurgery with SCTG presented at the 6th postoperative month, clinically satisfactory results for both groups. The mean percentage of root coverage in smokers becomes relevant in view of the results of the studies published so far with macrocirurgia. (3-8,11,12,13-15)

The clinical parameters of CAL, HKT, TKT, HGR and WGR showed statistically significant improvements ($p < 0.05$) 6 months after surgery in both groups, however, no statistically significant differences between smokers and nonsmokers were observed. These findings are in agreement with the sistematic review(16) published on the effects of smoking in root coverage procedures, with respect to improving these parameters after 6 months. However, it was observed significant statistical difference ($p < 0.05$) with greater reduction in gingival recession and clinical attachment gain in nonsmoking patients compared to smokers.

As for % RC, smokers had a lower mean (82.49 \pm 23.99 %) compared to non-smokers (96.66% \pm 6.83), with statistically significant difference

($p = 0.03$). Martins et al.⁽³⁾ Erley et al.⁽⁴⁾ and Souza et al.⁽⁸⁾ used the technique of Langer and Langer and obtained mean root coverage of 58.84% and 74.73%, 69.9% and 93.7%, 58.02% and 83.35% in smokers and nonsmokers, respectively. Silva et al.⁽⁵⁾ evaluated the technique of Coronally Positioned Flap (CPF) with vertical incision and reported percentages of 69.3% and 91.3% for smokers and non-smokers, respectively. Reino et al.⁽¹²⁾ conducted a study in smokers with split-mouth model comparing two surgical techniques with SCTG and observed mean root coverage of 43.18% (Langer and Langer) and 44.52% (Barros et al.). A sistematic review⁽¹⁷⁾ reported that the percentage of root coverage for macrosurgery techniques vary between 64.7% and 95.6% in nonsmokers. It is noteworthy that, when compared with studies using macrosurgery techniques for root coverage, the results of the present study were better, especially for smokers.

Evaluating studies that used the operating microscope, Burkhardt and Lang⁽¹⁸⁾ compared the results using Harris' technique for macro (control

group) and microsurgery (test group) with split-mouth model, only in smokers, and obtained after one year the mean root coverage of 98% for the test group and 89.9% for the control group. Bittencourt et al.⁽¹⁹⁾ also used the split-mouth model, in nonsmokers, following the same surgical technique of the present study, and obtained after one year the mean root coverage of 98% and 88.3 % in micro macro surgery. The results of this study are consistent with the literature data available on microsurgery when evaluating non-smoking patients.

It is noteworthy that among the studies cited earlier, only Bittencourt et al.⁽¹⁹⁾ used the same surgical protocol of the present study. These authors reported that the %RC obtained in nonsmokers with macro surgery technique, after 6 months, was 84.4%. This result was very close to those achieved in smokers in this study (82.49%).

The results also demonstrated a lower frequency of CRC in smokers (50%) than in nonsmokers (78.57%). A systematic review published in 2009⁽¹⁶⁾ reported that the percentage of CRC for the SCTG ranged from 27-80% in nonsmokers and between 0-25% in smokers. These data are consistent with the findings of this study when comparing non-smoking, however, smoking patients showed a frequency well above demonstrated by these authors. Studies inserted in the systematic review, however, did not use the operating microscope. Burkhardt and Lang⁽¹⁸⁾ reported a frequency of CRC of 87.5% and 50% after one month, and 62.5% and 25% after 12 months, for micro and macro surgery techniques, respectively. The results achieved in this study after 6 months for the group of nonsmokers, approaches that obtained after one year by Burkhardt and Lang,⁽¹⁸⁾ although there are differences between time and the techniques employed. Bittencourt et al.⁽¹⁹⁾ obtained 87.5% of CRC in the group undergoing microsurgery and 58.3% for macro technique. Again, the percentage of smokers that obtained CRR with microsurgical (50 %) approached the results obtained in non-smoking patients with macro (58.3%).

Since the mid- 60s, several studies in order to evaluate the procedures for treatment of gingival recessions were published. However, only in 1997

the first clinical study evaluating the root coverage in smokers undergoing the procedure of Guided Tissue Regeneration (GTR), with the use of polytetrafluoretilen membrane was published.⁽¹³⁾ This was a retrospective study with 6-month evaluation. Since then only 11 controlled clinical studies^(3-8,11,12,13-15) involving smokers were published, some of these being a republication of the same work with longer monitoring periods.^(6,7,13) The articles assessed the outcome of the procedures of GTR, CPF and SCTG with the technique of Langer & Langer. This is the first study conducted with the technique of SCTG associated with the CPF without vertical incisions with the aid of the operating microscope in the treatment of gingival recession in smokers.

This controlled clinical study creates new expectations for further studies within this line of research. Studies comparing macro- and microsurgical techniques in the treatment of gingival recession in smokers should be developed. Further studies should adopt similar methodologies and surgical techniques for better comparison of the results, as well as performing the cotinine test to establish a criteria for comparison between groups of different studies and explaining the different results presented.

CONCLUSIONS

Smokers have less favorable outcomes to root coverage compared to nonsmokers, however, may have higher percentages of root coverage and higher frequency of complete root coverage with the use of periodontal microsurgery, compared to previously published controlled clinical trials.

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