Type of study: ***Original Research***

Prevalence of Complications after Gingival Recession Coverage Procedure - A Retrospective Cohort Study

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Abstract

Gingival Recession is one of the common esthetic problems reported by patients for which recession coverage procedures like either flap or gingival grafting techniques are routinely practiced with high predictability and outcome. However these procedures also endup in morbidities like bleeding, necrosis etc. Hence the aim of the present study is to assess the complications after the recession coverage procedure. A retrospective evaluation was conducted to find out subjects who had undergone the gingival recession coverage procedure between June 2019- March 2020 at the University Dental Hospital. For the included subject, data regarding complications if present, demographic factors, other clinical factors associated with the complication were extracted. Out of 23 subjects, the prevalence of complications after gingival recession coverage procedure is 60.8%. Out of this post operative bleeding was the highly prevalent complication (43.5%), followed by tissue necrosis (17.3%) associated with subepithelial connective tissue graft. There were no reports of postoperative infection. A significant association was found with class 3 Miller's recession defect and tissue necrosis.(P=0.05, chi square analysis). However considering the retrospective nature of the study, future literatures must be emphasised to analyse better patient outcomes and minimise the complications.

Keywords: *Gingival recession coverage,tissue necrosis, postoperative bleeding, infection*

Introduction

Gingival recession has become one of the common dental complaints reported by patients nowadays. It is the apical shift of marginal gingiva from its normal position on the crown of the tooth[1]. The etiology of gingival recession is found to be multifactorial such as traumatic toothbrushing, lack of oral hygiene leading to plaque accumulation, abnormal oral habits and frenal pull which may lead to tooth sensitivity, unaesthetic appearance and caries [2]. Surgical treatments like free graft and pedicle flap are indicated when the gingival recession causes functional or esthetic problems [3]. The pedicle flap technique includes coronally advanced flap, laterally displaced flap, rotational flaps, double papilla technique in which adjacent gingival tissue is displaced to the defect site. In graft techniques like free gingival graft & connective tissue graft, it requires a second surgical site to procure the connective tissue either from palate or tuberosity to be placed over the defect site[4]. Of this subepithelial connective tissue graft (SCTG) is considered the gold standard technique till now, for its higher predictability and esthetic outcomes [5–13].However in spite of this good clinical outcome, it always requires a second surgical site for the graft procurement which predisposes the patient to operative & post operative complications [14,15]. During operative procedure especially while procuring graft from palate, nicking of greater palatine blood vessels can lead to profuse bleeding [15,16]. Also postoperatively this technique especially free gingival graft (FGG) leaves an open surgical wound that may start bleeding even on slight provocation during

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regular oral activities, and also contribute to pain, infection, swelling[17]. Sometimes the graft placed over the defect site if not of adequate thickness or handled improperly may undergo necrosis [18,19]. Necrosis can also develop due to inadequate revascularisation that results from improper stabilisation of the graft etc [20–25]. All these together predisposes to greater morbidity and to less acceptance of these treatment procedures by the patients [26,27]. A thorough knowledge on the appropriate selection of suitable technique for a specified gingival recession defect and identification of the risk factors associated with the complication can greatly prevent this occurrence. Hence the aim of this study is to assess the prevalence of complications after gingival recession coverage procedures and identify the risk factors associated with it.

Materials and Methods

This is a retrospective clinical study that is performed to evaluate the complications of recession coverage procedure in University dental hospital. After obtaining the ethical clearance form the Institutional Review Board of University Dental Hospital, the list of all the subjects treated with gingival recession coverage were retrieved by reviewing the 86000 patient's record who have visited the hospital during the study period from June 2019 to March 2020 based on the following criteria.

Inclusion criteria:

- Subjects above 18 years of age
- Subjects who underwent gingival recession coverage procedure between June 2019 and march 2020
- Subjects who have finished at least 2 consecutive postoperative followup.
- Subjects with gingival recessions associated with either anterior or posterior teeth or both
- Records with complete data and photographs during followup visits

Exclusion criteria:

- Smokers
- Records with incomplete data of clinical examination

The search resulted in a total of 23 patients who underwent one of the following recession coverage procedures like Subepithelial connective tissue graft, free gingival graft, and coronally advanced flap with 13, 4 and 6 subjects respectively. All the procedures in this study were performed by the post graduate students specialising in periodontics. Before the start of surgery, all the included subjects underwent a scaling and root planing. After the appropriate recession coverage surgical procedure, hemostasis was achieved in all the cases before disposal. Standard oral hygiene and post operative instructions with medication as required were prescribed for the patient. For suture removal and post operative review, the patient was recalled after 14 days during which the healing was documented and photographed. The age range of patients included for this study was 19-47 years.

From the preoperative and postoperative clinical clinical finding documented and photographs available for the included subject the demographic data like age, gender, site of gingival recession, clinical data like gingival recession defect characteristics, type of recession coverage attempted, operative and post operative clinical observations and findings were retrieve and summarised in Table 1. The collected data was tabulated in excel sheet. The data is imported and transcribed in Statistical Package for the Social Sciences, version 17(SPSS, IBM corporation). Descriptive analysis was based on quantitative variables and frequencies for categorical variables. Pearson chi square test was employed. P less than or equal to 0.05 was considered statistically significant with a confidence interval of 95%.

Results and Discussion

Table 1: Shows the Descriptive Statistics on frequency and distribution of all the study variables like Age, Gender, Characteristics of Recession Defects, Type of Recession Coverage Procedure and the Site Performed.

VARIABLE	FREQUENCY	PERCENTAGE (%)
Number of included subject	23 (1 defect in each subject)	-
Gender		
Male	13	58.8
Female	10	41.2
Age (Mean - 34.06)	Range (19-47)	-
Recession defect Characteristics (Based on Millers Classification)		
Class I	9	34.7
Class II	5	19.2
Class III	12	46.1
Recession coverage technique used		
Recession coverage with flap	6	26.1
Recession coverage with graft	17	73.9
Site of recession coverage procedure		
Incisor	18	78.3
Canine	4	17.4
Premolar	1	4.3

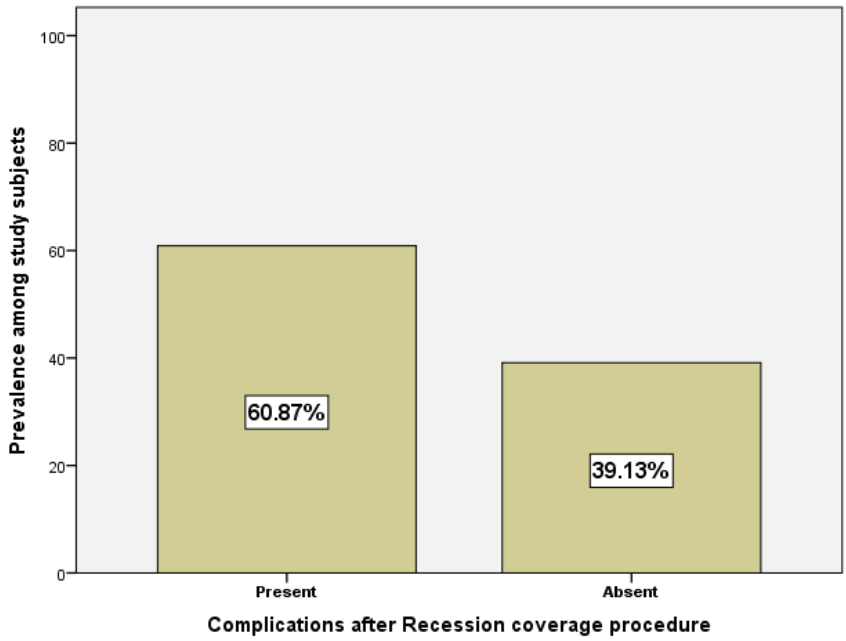

Figure 1: Bar graph shows the prevalence of complications after recession coverage procedure. X axis represents the complications after recession coverage procedure and Y axis represents the percentage of participants. Out of 23 subjects, 60.8%(14) showed postoperative complications whereas 39.1%(9) does not show any complications.

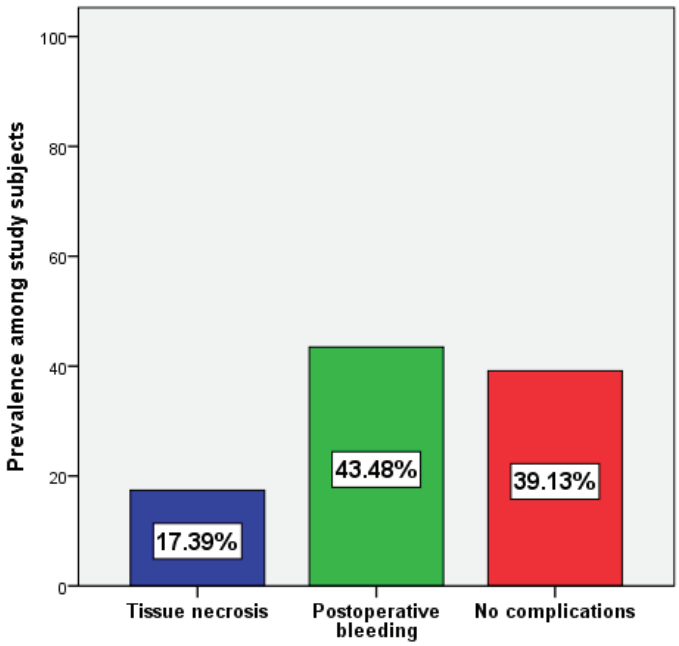

Figure 2: Bar graph shows the prevalence of each postoperative complications after recession coverage procedure. X axis represents the different postoperative complications and Y axis represents their respective prevalence (blue- tissue necrosis, green- postoperative infection, red- no complications). From the graph, the prevalence of tissue necrosis and postoperative bleeding was found to be 17.3% and 43.4% whereas no postoperative infection was reported. Only 39.1% does not show any complications.

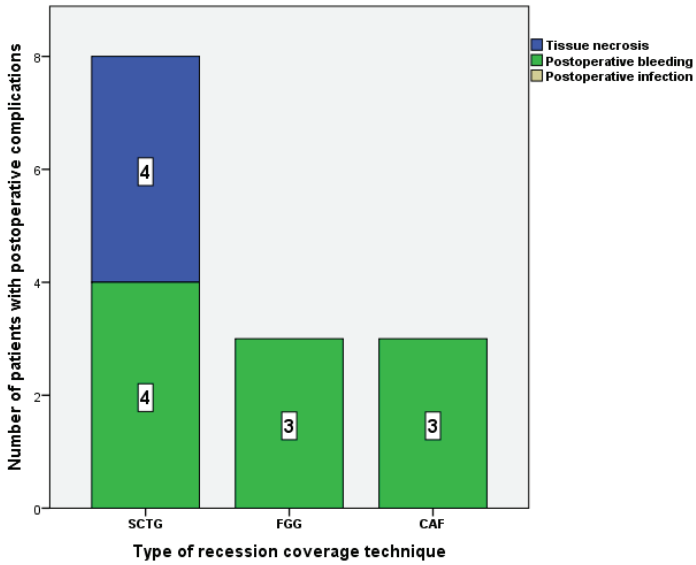

Figure 3: Bar graph shows the association of postoperative complications and the type of recession coverage technique used. X axis represents the type of recession coverage technique and Y axis represents the frequency of postoperative complications (Blue-tissue necrosis, green-postoperative bleeding, green-infection). Chi square test was done and showed statistically significant association between postoperative complication and SCTG technique. Chi-square test value:2.240 ,df:2, P=0.05 p<0.05 significant.Hence, the postoperative complications after recession coverage procedure are significantly higher among SCTG technique compared to FGG and CAF. (SCTG - Subepithelial Connective Tissue Graft, FGG - Free Gingival Grafts, CAF - Coronally Advanced Flap).

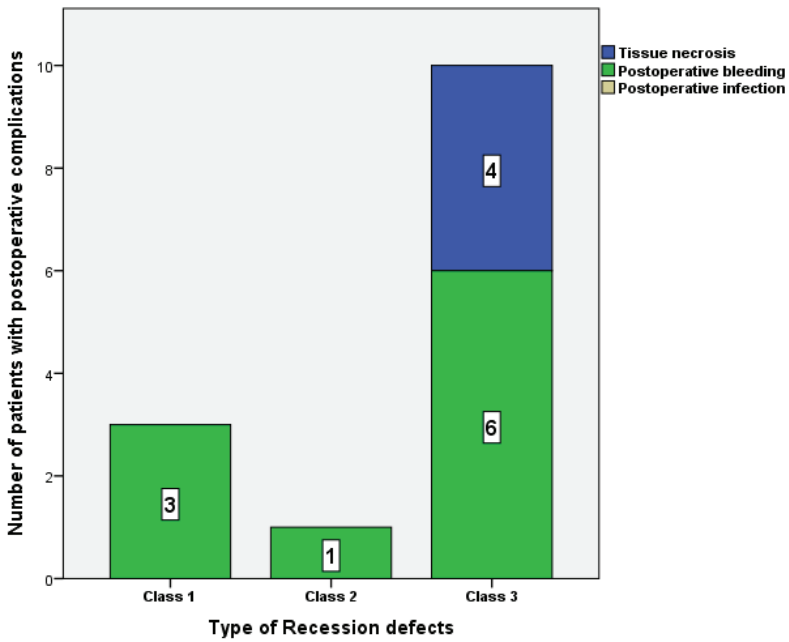

Figure 4: Bar graph shows the association of postoperative complications and type of recession defects. X axis represents the type of recession defects and Y axis represents the frequency of patients with postoperative complications (Blue - tissue necrosis, green - postoperative bleeding). Chi square test was done and was found to be statistically significant. Chi-square value -4.439, df:2, P=0.05, significant. Hence the total number of complications were higher among class 3 recession defects when compared to class 1 and 2 defects.

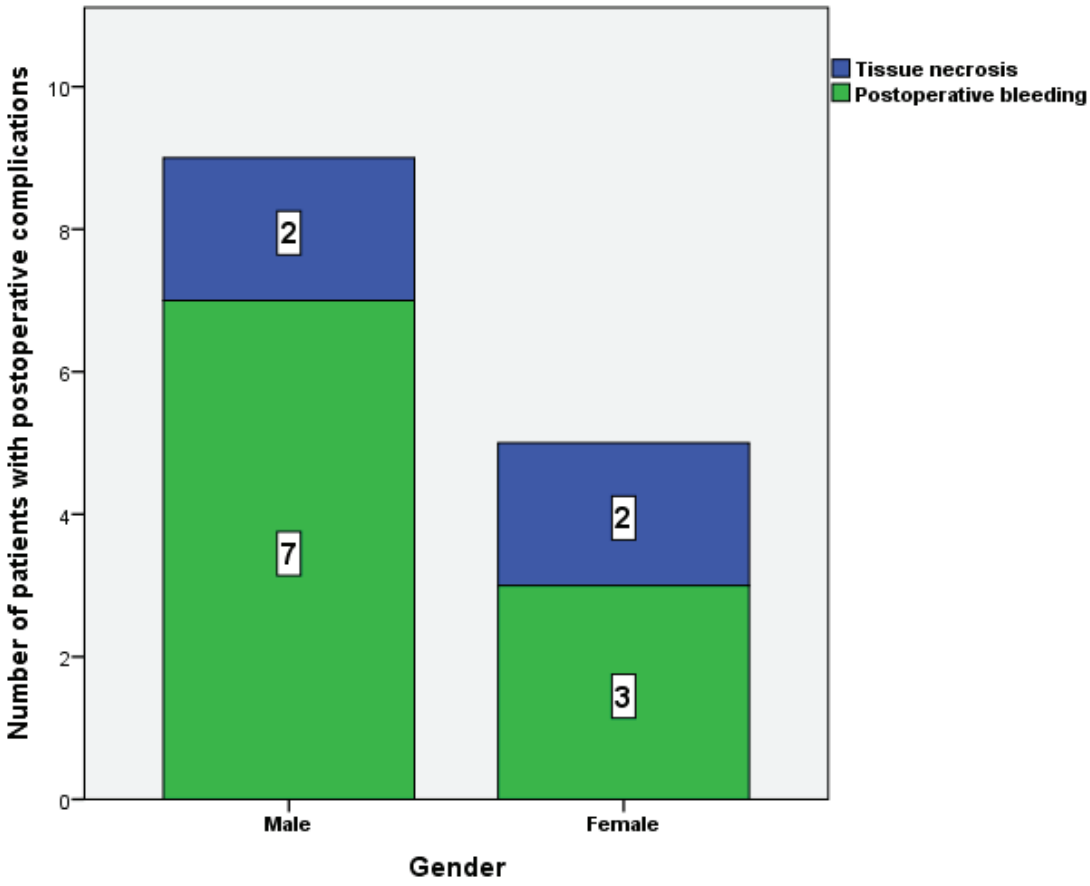

Figure 5: Bar graph shows the association of gender and postoperative complications of gingival recession coverage procedure. X axis represents the gender of the participants and Y axis represents the frequency of patients with postoperative complications. (Blue - tissue necrosis, green - postoperative bleeding). Though males reported more postoperative complications than females, there was no statistically significant association found between the prevalence of complications and the gender (Chi-square value:0.750,df:1,P=0.38). Hence postoperative complication after recession coverage procedures are equally prevalent among both genders.

In the present study, the results show there is a higher prevalence/ incidence (60.8%) of postoperative complications with gingival recession coverage procedures at the university dental hospital. Post operative bleeding was the most commonly reported (43.5%) complication among the study subjects. The results are concurrent with earlier reports by Del Pizzo et al, where 33% of the cases reported postoperative bleeding with respect to FGG[28] . This is evident in our study, where subjects who underwent graft technique for recession coverage contributed to higher incidence of postoperative bleeding than the pedicle flap techniques. The major causes for postoperative bleeding after graft techniques from the donor could be the mechanical trauma from oral activities that could distort the blood clot that was achieved during operative procedure. However the trauma can be prevented by use of protective acrylic stents that should be worn until initial healing of the open wound site is observed[29]. The chances of bleeding complications are even higher when the graft donor site lies in the course of the greater palatine vessels. This can be mostly prevented by adequate knowledge about the course of the blood vessels, but cannot be ruled out in all cases due to anatomic variation in the course[30].

Next to postoperative bleeding, tissue necrosis was reported in four patients (17.3%) who underwent SCTG technique. Similar findings are seen in the study conducted by Zorzano et al who reported a 25% prevalence rate of tissue necrosis[18] . Another study conducted by

Gobbato et al reported a 17% prevalence rate of tissue necrosis in SCTG which is slightly lower compared to the present study[20]. Necrosis usually happens when the tissue vascularity is compromised especially in case of gingival grafts transplanted from palate to recipient site, unless the graft is properly stabilized over a vascular bed, the revascularization of the graft is questionable and can highly result in necrosis. It also depends on the presence of adequate thickness of graft for initial survival and to resist surgical trauma[31]. No necrosis was seen at defects treated with pedicle flaps which might be due to adequate vascularity of flaps which are still connected to the donor sites. In contrast, Harry et al reported no graft necrosis in relation to SCTG [27].

A significant association was found between class III recession defect (40%) and tissue necrosis but not with class I and class II. According to Machtei et al., in their study analysed the root coverage among patients with class III millers recession reported that initiation of graft necrosis is one of the factors for partial root coverage [26, 32, 33].

The Current study reported no postoperative infection at the surgical sites. Similar to this Zorsano et al, also reported no incidence of infection with CTG[18] . The absence of postoperative infection in our study might be due to the strict aseptic surgical protocol carried out, with good oral hygiene maintenance and prescription of systemic antibiotics and mouthwashes.

The limitations of the study are the retrospective study design and smaller sample size. Hence further research with prospective longitudinal study design and larger samples are necessary to come up with stronger evidence.

Conclusion

Within the limits of the study, recession coverage procedure results in higher prevalence of complications especially postoperative bleeding and tissue necrosis and Class III recession defects increase the risk of the complications.

Acknowledgement: The authors would like to acknowledge the help and support rendered by the Department of Periodontology and Department of Information Technology of Saveetha Dental College and Hospitals and the management for their constant assistance.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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