

# A RETROSPECTIVE ANALYSIS OF PREFERRED CHOICE OF TREATMENT FOR GINGIVAL RECESSION COVERAGE

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## ABSTRACT

Periodontal plastic surgeries have gained popularity in recent years and tremendous advancements and documentations have been published using various allogeneic materials, allogeneic grafts, and guided tissue regeneration. This study aims to find out the frequency of the techniques used for the recession coverage procedure in private dental college, Chennai. This was a single university based study where retrospective analysis was carried out using data collected from digital patient data recording software. More inclination for using grafts over flap techniques was found amongst the screened individuals. 81.3% procedures performed in the study population had a preference for autogenic grafting over flap for recession coverage procedure. The percentage of connective tissue graft (CTG) procedures was 54.9%. Within the limits of the study it could be concluded that surgeons had inclinations towards using grafting procedures over flap techniques as the outcomes were predictable in grafting procedures.

**Key Words :-** Free autogenous graft, gingival recession, pedicle grafts, recession coverage

## INTRODUCTION

Historically periodontal procedures have only been concerned with pocket elimination, disease control and furcation maintenance. In recent years periodontal plastic surgeries have gained popularity in recent years and tremendous advancements and documentations have been published using various allogeneic materials, allogeneic grafts and guided tissue regeneration. American academy of periodontology defines Gingival recession as “the displacement of marginal gingiva apical to the cemento-enamel junction (CEJ).” (American Academy of Periodontology 1992) The term “marginal tissue recession” is considered to be more accurate than “gingival recession,” since the marginal tissue may have been alveolar mucosa (AAP). (‘Tooth brushing and gingival recession’, 2008; Thamaraiselvan *et al.*, 2015)

One of the most common aesthetic problems faced is the receding marginal gingival tissue due to various reasons. Causes of the recession can be attributed to disease conditions, poor or improper oral hygiene maintenance, trauma or anatomical factors such as malposed or missing teeth, clefts etc. (Allen and Miller, 1989; Agudio *et al.*, 2008; Rai, Janardhanam and Rai, 2015; Cairo *et al.*, 2016; Cairo, 2017)

Most of the treatments are primarily aimed towards cessation of the progression of marginal tissue recession and to enhance the esthetic outcome. Exposed root surfaces are one of the cordial causes of hypersensitivity. Furthermore gingival recession may also lead to in-adequate attached tissue which may hamper proper plaque removal, root caries, favourable contours for excessive plaque formation. Periodontal surgical procedure aimed at covering the gingival recession not only resolves the aesthetic problems also restores the functionality of the tooth.

Various procedures have been advocated towards the root coverage some of the most common techniques are use of different flap techniques such as laterally advanced flap, coronally advanced flap, and pedicle flaps; autogenic grafting procedures include connective tissue grafts , free gingival graft, and guided tissue regeneration (GTR).(Baelum, Fejerskov and Karring, 1986; Allen and Miller, 1989; Cairo *et al.*, 2011; Aroca *et al.*, 2013; Jepsen *et al.*, 2018). The aim of this retrospective study was to evaluate the prevalence of recession coverage techniques used and correlating with other factors such as age and suturing techniques.

## **MATERIAL AND METHODS**

A single university based study setting was carried out in Saveetha Dental College And Hospital Chennai. University setting was chosen to ensure a maximum number of samples due to affordable treatment. Patient records from the university database were reviewed and the study samples were selected. The data collection was done for the period from June 2019 to March 2020. Inclusion and exclusion were as follows.

### **Inclusion criteria**

1. Complete patient records
2. Patient consent for the treatment
3. Preoperative , intraoperative and immediate postoperative images
4. No systemic conditions.
5. Millers class I and class II recessions cases

### **Exclusion criteria**

1. Incomplete patient records
2. Incomplete or improper photographic records of the case.
3. Millers class III and class IV recession cases.

After reviewing the patient records, 43 case records met the inclusion criteria and were selected to be included in the study. Patients were segregated according to the choice of technique to treat the gingival recession , they were divided into 2 groups as following

1. Recession coverage done using flap technique .
2. Recession coverage done using grafting procedure.

## **Parameters Assessed**

### **Primary parameter:**

- Treatment modalities: CTG (connective tissue grafts), FGG (free gingival grafts) , LAF (laterally advanced flap) and CAF (coronally advanced flap)

### **Secondary parameters :**

- Demographic details such as name , age , sex , medical and dental history
- Suturing technique

## **Statistical Analysis**

IBM SPSS version 20 was used to statistically analyse the collected data. Tendency of the individuals to prefer a specific technique of the recession coverage was calculated and statistical analysis was done using chi square test, ANOVA test and correlations.

## RESULTS AND DISCUSSION

CTG (48%) is the most commonly performed procedure for gingival recession coverage followed by FGG (36%), LAF (9%) and CAF (7%) (Figure 1). Distributions of mean age in the various treatment modalities showed no statistical significance (Figure 2). The prevalence of the suturing techniques used in the various techniques showed the following significant findings: Anchor suturing was only done in the CTG cases; Holbrook Oschlenbein suturing was only done in FGG cases. and Horizontal mattress, sling and direct loop suturing were used significantly in the CTG cases. (Figure 3)

In recent years researchers and periodontal surgeons have shown great amount of interest in the periodontal plastic surgeries to augment mucogingival soft tissue around teeth, implants for correcting the defects such as insufficient keratinized tissue thickness, defects in the level of the gingiva and exposed root surface.(Pini-Prato *et al.*, 2010; Cairo *et al.*, 2016; Cairo, 2017)

Although recession is accepted to be a multifactorial condition in recent years, high association between faulty tooth brushing and gingival recession was found in multiple studies(Pini Prato *et al.*, 2005; Cortellini *et al.*, 2009; Cairo, 2017). In the 1970's Goldman & Cohen put forward the role of inflammatory process in progression and aetiology of the gingival recession(Goldman, 1973). Localised proliferation of epithelial cells into connective tissue due to inflammation can be one of the causes for the recession.(Pini Prato *et al.*, 2005; Cortellini *et al.*, 2009; Matas, Sentís and Mendieta, 2011)

Systematic review (Roccuzzo *et al.*, 2002) showed that all the techniques were successful in significantly covering the exposed root surface and connective tissue grafts was found most effective for the treatment over other techniques such as guided tissue regeneration, FGG, PRF and other techniques hence it has been recognised as gold standard in treating recession. As low data of free gingival grafts and laterally advanced flaps is available the outcome predictability cannot be assured for these treatments. These results coincide with the findings from the present study as most procedures done have utilised connective tissue graft (48%) followed by free gingival grafts (36%), laterally advanced flaps (9%) and coronally advanced flaps (7%) (figure 1). Study also stated that root bio-modification does not have significance on the root coverage. Over the years it has been proven that CTG results in a better shade match of the grafted site also provides better vascular bed for the grafted tissue hence more predictable results.(Heß, no date; Kasaj, 2018; Adam *et al.*, 2019) (Bouchard, Nilveus and Etienne, 1997; Amarante *et al.*, 2000; Roccuzzo *et al.*, 2002)

Choice of the technique to be chosen for a particular case depends on various factors such as recession classification, site, availability of the attached gingiva, residual bone level, operator skill, material availability, local factors, individual tooth prognosis, technique sensitivity of the procedure etc. there mainly two types of procedures 1) recession coverage with flap also known as pedicle grafting / pedicle flap and 2) free grafts. In pedicle flaps the flap can be rotated, laterally stretched / advanced, coronally advanced etc. In free grafts CTG – connective tissue graft, FGG – free gingival grafts, PRF (platelet rich fibrin) etc. (Bernimoulin, Luscher and Muhlemann, 1975; Allen and Miller, 1989; Prato, Clauser and Cortellini, 1995; Gapski, Parks and Wang, 2005; Hawkins, Virani and Ceconi, 2013; Varghese *et al.*, 2015; Avinash, Malaippan and Dooraiswamy, 2017; Ramesh, Ravi and Kaarthikeyan, 2017; Ravi *et al.*, 2017; Kavarthapu and Thamaraiselvan, 2018; Hwang, 2020)

All the grafts heal in one of the following ways: 1) either by formation of a long junctional epithelium or 2) scar formation; healing and prognosis also depends on the type of suturing technique, suturing material and the skills of the operator. Newer suturing techniques such as modified horizontal mattress, modified suspensory suturing technique, criss-cross suturing technique etc.(Matthews *et al.*, 1978; Tjan, Miller and

Josephine G. P. The, 1984; Miller, 1993; Allen, 1994; Rebele, 2009; Wang, Modarressi and Fu, 2012; Aschheim, 2014; Barros *et al.*, 2015; Rai, Janardhanam and Rai, 2015). Multiple techniques and modification have been made in the recession coverage procedure along with the tremendous advancements in artificial materials mimicking the autogenic tissue to avoid the second surgical site as well as advancements in suture material and modified suturing techniques has an huge impact on the treatment outcome in recent days(Ronco and Dard, 2016) . Use of autogenous grafts , PRF , alloplastic materials , different flap techniques , minimally invasive procedures such as tunnel and pouch , pinhole technique are the tip of the iceberg(Chao, 2012; Dani, Dhage and Gundannavar, 2014; Beck, 2016) When treating any recession case overcorrecting the defect is always advisable to ensure better longevity of the treatment.(Cortellini and Prato, 2012; Panda *et al.*, 2014; Thamaraiselvan *et al.*, 2015; Khalid *et al.*, 2016, 2017; Mootha *et al.*, 2016; Ramesh, Sheeja Saji Varghese, *et al.*, 2016; Ramesh, Sheeja S. Varghese, *et al.*, 2016; Priyanka *et al.*, 2017; Ravi *et al.*, 2017; Kavarthapu and Thamaraiselvan, 2018; Ramamurthy and Mg, 2018; Arunachalam and Varghese, 2019; Ramesh *et al.*, 2019)

### **Limitations**

1. Single university based sampling / convenience sampling.
2. Limited sample.

### **Future scope of the study**

Study can be useful in spreading awareness amongst the periodontal surgeons also would help to motivate the operators as well as the patients about the newer techniques and treatment possibilities. It is important to understand that periodontal drape plays an equally important role in the smile designing.

### **CONCLUSION**

Periodontal plastic surgery plays a key role in the smile designing along with the prosthetic and restorative factor. Within the limits of the study it can be concluded that connective tissue grafts is most frequently used in the selected sample

### **AUTHORS CONTRIBUTION**

1. Conception and design of study : Gaurav Ketkar , Karthickraj SM
2. Acquisition of data : Gaurav Ketkar
3. Analysis and /or interpretation of data : Gaurav Ketkar , Karthickraj SM
4. Drafting of the manuscript : Gaurav Ketkar
5. Revising the manuscript critically for intellectual content : Gaurav Ketkar , Karthickraj SM
6. Approval of the version of the manuscript to be published : Karthickraj SM

### **CONFLICT OF INTEREST**

The authors state that there are no competing factors.

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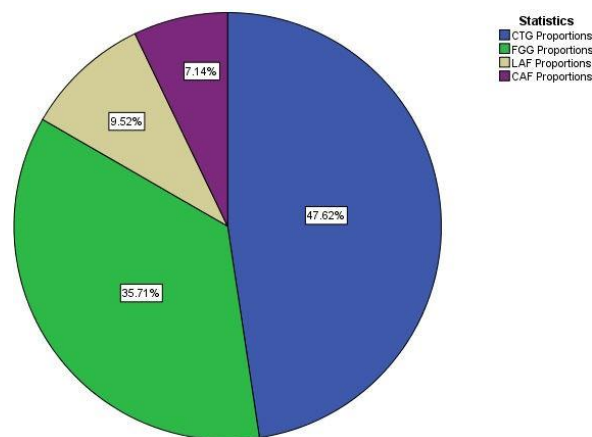


Figure 1: Pie chart showing distribution of individual techniques performed for recession coverage. Connective Tissue Grafts (CTG) accounting for 47.62% was the highest preferred treatment modality next to Free Gingival Grafts (FGG) accounting for 35.71%, Laterally Advanced Flap accounting for 9.54% and Coronally Advanced Flap accounting for 7.14%.

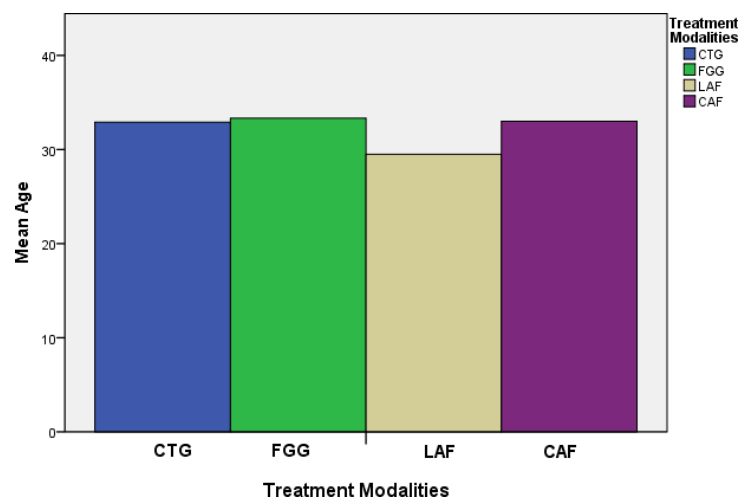




Figure 2: Mean Age plots of the various treatment modalities in the study. X axis represents the type of treatment used for recession coverage procedure where CTG: Connective Tissue Grafts; FGG: Free Gingival Grafts; LAF: Laterally Advanced Flap; CAF: Coronally Advanced Flap and Y axis represents the mean age of the individuals falling into each category. Mean age of the individuals did not differ with the type of treatment modalities. There was no statistically significant difference between the age and the chosen treatment modality. (ANOVA Test F Value: 0.229; p value:0.876)

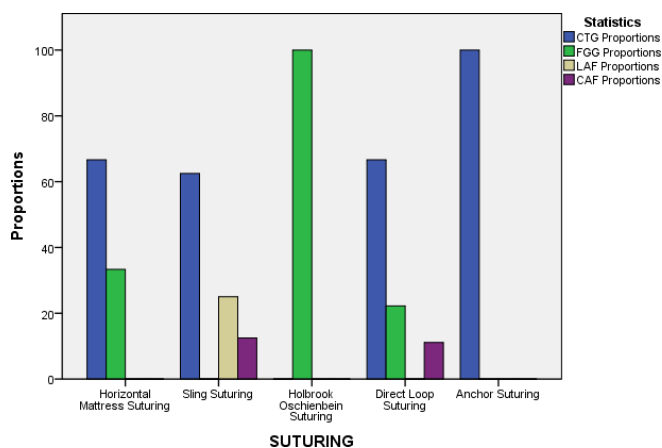


Figure 3: Bar chart showing distribution of various suturing techniques across treatment modalities. X axis represents the various suturing techniques done for various recession coverage procedures. Y axis represents the proportions of suturing techniques used in various recession coverage procedures. Blue color bar indicates the proportions of Connective Tissue Graft (CTG) procedures; Green color bar indicates the proportions of Free Gingival Graft (CTG) procedures; Yellow color bar indicates the proportions of Laterally Advanced Flap (LAF) procedures; Magenta color bar indicates the proportions of Coronally Advanced Flap (CAF) procedures. Pearson Chi-Square Value: 37.858 p value: 0.001, which is statistically significant. The following significant findings could be interpreted from the graph: Anchor suturing was only done in the CTG cases; Holbrook Oschlenbein suturing was only done in FGG cases. and Horizontal mattress, sling and direct loop suturing were used significantly in the CTG cases.