A Study to Measure Pain Perception Following De-Epithelized Free Gingival Graft Harvesting.

Study Protocol & Statistical Analysis Plan

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1. Study Protocol 1. Objectives/Specific Aims:
The purpose of this study is to compare the effect of a hemostatic collagen sponge, a collagen sponge sealed with a bio-adhesive material, a Platelet rich fibrin and a physical barrier(stent) on the palatal donor sites with the purpose of minimizing postoperative pain after epithelialized gingival graft harvesting.

2. Materials and Method:
Study population:

A total of 80 patients seeking treatment at the UAB SOD Graduate Periodontology clinics will be recruited to participate in this study. The potential candidates will be approached during the treatment planning and/or pre-surgical visit in the periodontal clinic. The investigator/research staff will give the information sheet to the potential participants, explain the study and obtain the patient demographics if the patient participate in the study. Conventional oral impressions will be made to fabricate a customized acrylic stent for the patient who will receive palatal stent.

This study will conduct a survey using the (VAS) Visual Analog Scale of the postoperative pain following the (FGG) Free Gingival Graft procedure technique with four different methods for coverage of the palatal donor site and evaluating differences in the patient painkiller consumption and willingness to repeat the surgery in the future. On the day of the surgical procedure participants will be given copies of a pain survey (Visual Analog Scale) to be filled every day for two weeks (14 days). The participants will receive a reminder phone call daily to complete the survey. The completed survey (VAS) forms will be collected/returned to the research staff on the day of their follow-up visit.

Study Group:

1: Collagen Plug + Sutures (CPS)

2: Collagen Plug with cyano-acrylate (CPC)

3: Platelet-rich Fibrin (PRF) + sutures

4: Palatal Stent (PS)

3. Study Background:
Periodontal plastic surgery has long been successfully performed for the treatment of gingival recessions and mucogingival deformities. Numerous techniques have been proposed in an attempt to obtain predictable root coverage outcomes. However, the results do not only depend on the technique selected but also on a variety of factors including but not limited to patient- and site-related factors.

Harris in 1997 developed a technique based on a special scalpel for including an epithelial margin into the harvested CTG. Years later, several variations for CTG harvesting were described aiming at reducing the postoperative morbidity by ensuring healing by primary intention. However, these techniques required a certain amount of palatal thickness in order to avoid desquamation of the undermined superficial flap due to compromised vascularization. Indeed, as highlighted by Zucchelli and colleagues, a common complication of these harvesting techniques is the

dehiscence or the necrosis of the primary flap if it was too thin or if sutures failed to secure it over the palatal wound.

To avoid the necrosis of the primary flap, a certain amount of the sub-epithelial connective tissue should be preserved and because of this, the deeper connective tissue harvested is less dense, less stable, richer in fatty and glandular tissue, and more prone to shrinkage. Some clinical studies have reported higher postoperative pain and morbidity following EGG when compared to CTG. Hence, several attempts were undertaken to control the palatal pain following EGG harvesting techniques, such as irradiating the palatal wound using lasers, the addition of platelet-rich fibrin, or a collagen matrix over the donor wound site. These techniques reported different levels of success. Recently, bio-adhesive materials, such as cyanoacrylate surgical glue, have been successfully introduced in ophthalmology, in the treatment of massive hemoptysis, in embolization, and for wound closure in dermatology due to their strong sealing, bacteriostatic, and hemostatic properties. Among the advantages of bioadhesive materials, their high tissue compatibility and long half-life have also been described.

This study will evaluate the postoperative pain following the EGG technique with four different methods for coverage of the palatal donor site. The control group will not be protected with any material. Test group 1 will be protected with Platelet rich Fibrin (PRF) while the test group 2 will consist of collagen protection with the additional layer of cyanoacrylate surgical glue. Test group 3 will consist of collagen protection with the application of a physical barrier (Stent) to cover the donor area.

4. Statistical Analysis

Patients' demographics and clinic characteristics at baseline will be summarize with descriptive statistics such as mean, standard deviation (SD), frequency, and proportion where appropriate. The group comparisons at baseline will be conducted with analysis of variance (ANOVA) or Fisher's exact test. Outcome variables – number of analgesics consumed and need for additional analgesics – will be summarize as median and range in each group and the group comparisons will be conducted with Kruskal-Wallis's test followed by post hoc Bonferroni-corrected Wilcoxon rank-sum tests. All the other outcome variables including pain score, swelling level, amount of bleeding, activity tolerance, and the need for additional analgesics will be summarize with mean ± SD, and analyzed using a general linear mixed regression model to account for the repeated measures. Similar general linear mixed regression models will also use to explore the associations between outcome variables and graft length, width, area, and thickness. All analysis will be conducted using SAS 9.4 (Cary, NC, USA) under the significance level of 0.05.

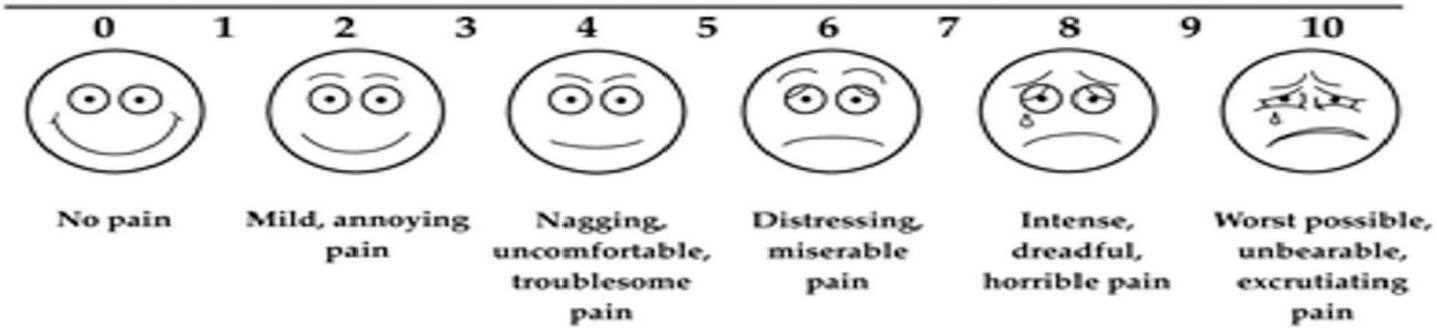
Visual Analog Scale (VAS)

Site: _____

Subject ID #: _____ Date: _____

Please circle a number for each:

1. *Pain*



2. *Swelling*

0 1 2 3 4 5 6 7 8 9 10
No Swelling — Moderate Swelling — Severe Swelling

3. *Bleeding*

0 1 2 3 4 5 6 7 8 9 10
No Bruising — Moderate Bruising — Severe Bruising

4. *Activity Tolerance Scale*

0 1 2 3 4 5 6 7 8 9 10
No Limitation — Can be Ignored — Interferes with Tasks — Interferes with Concentration — Interferes with basic Needs — Bedrest Required

5. *Did you need to take more painkillers due to palatal pain?* *Total No. of pills:* ___

0 1 2 3 4 5 6 7 8 9 10
No I didn't need any — I took some — I almost finished them. — I needed them badly

6. *Will you do this surgery again?*

0 1 2 3 4 5 6 7 8 9 10
OMG,Definitely Not — If I need to — I Dont mind