Project title:

treatment of multiple adjacent gingival recessions with interproximal attachment loss with an acellular dermal matrix and apical buccal access. Randomized clinical trial.

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Aim and Purpose

the aim of this randomized clinical trial is to evaluate the clinical efficacy and patient perception of a surgical intervention for the treatment of multiple adjacent gingival recessions that combines an apical buccal access flap with the use of either an acellular dermal matrix or an autologous connective tissue graft in terms of complete root coverage and patient reported outcome measures.

Project design

the study will be a prospective randomized clinical trial with a follow-up of 12 months. Patients presenting multiple adjacent gingival recessions with interproximal attachment loss (RT3 from Cairo et al 2011 Classification) will be treated with an apical buccal flap and acellular dermal matrix (Oracell®) (test) or autologous connective tissue graft (control) randomly. The randomization and treatment allocation to the experimental and control groups will be performed using sealed envelopes.

Test hypothesis

the use of acellular dermal matrix (Oracell®) in the treatment of multiple adjacent gingival recessions in teeth with attachment loss reduces the patient morbidity, surgical intervention time and offers non inferior clinical outcomes in terms of complete coverage of the recession, percentage of coverage or reduction of the recession, increase of keratinized tissue thickness and width and volumetric changes.

Statistical method

The statistical analysis will take into account all the data collected before, during and after the surgical intervention. A descriptive statistic of the data obtained in both groups will be carried out during the study. For the analytical statistics a Shapiro-Wilk normality test will be performed for the quantitative variables. The changes in the means obtained between the initial situation and 12 months of follow-up will be evaluated using a McNemar test. The patient is the unit of analysis. The data obtained will be analyzed through the SPSS SPSS Statistics Desktop program, V21.00 (SPSS Inc., Chicago, IL, USA)

Material and method

1. **Pre-screening.** The clinical component of this randomized clinical trial will be conducted in Clínica Ortiz-Vigón from January 2024 to January 2029. The study will study running with the approval of the local ethics committee and after registering at isrctn.com

2. **Clinical Screening:** a complete medical and dental history will be obtained. Patients will be informed of the study purpose. Consent will be obtained by both, written and verbal explanations of the potential risks and benefits of participating, along with other possible treatment options. Ample time will be designated for questions and answer, if needed.

3. P**re-Surgical records:** complete intra-oral photographs, periapical x-ray (2D), CBCT (3D) and intra-oral scan (STL). 7 days before to these records a supportive periodontal maintenance will be performed.

4. Inclusion criteria:

- Age ≥ 18 years
- Periodontally and systemically healthy
- Patients presenting multiple (at least 2) adjacent gingival recessions with interproximal attachment loss - RT3 gingival recessions from Cairo et al 2011 Classification, including gingival recessions in upper and lower maxilla from premolar to premolar area.
- Full mouth plaque score and full mouth bleeding score ≤ 20% (measured at four sites per tooth)
- The patient must be able to perform food oral hygiene

5.Exclusion criteria:

- Contraindications for periodontal surgery or systemically unhealthy
- Patients pregnant or attempting to get pregnant
- Uncontrolled periodontal disease
- Gingival recessions in molar area
- Single gingival recession

6. **Randomization**: before the surgical intervention each subject will be randomly assigned with the assistance of computer software to one of the following groups: control group: treatment of gingival recessions with apical buccal access flap/approach and autologous connective tissue graft. Test group: treatment of gingival recessions with apical buccal access flap/approach and acellular dermal matrix (Oracell®)

7. **Baseline measurements:** a periodontal metallic probe will be used to record gingival and plaque indexes, probing pocket depth, width of keratinized tissue and vestibulum depth. An intra-oral scan will be used to assess the volumetric the volumetric changes, changes in soft tissue thickness and root coverage (percentage and record of complete root coverage).

8. **Surgical intervention:** control group: treatment of gingival recessions with apical buccal access flap/ approach and autologous connective tissue graft. Test group: treatment of gingival recessions with apical buccal access flap/approach and acellular dermal matrix (Oracell®)

9. **Postoperative care:** Subjects will receive detailed written and verbal post-operative instruction. Subjects will be instructed to avoid mechanical disturbance of the surgical site for the first week. Oral hygiene instructions included 0.12 clorhexidine mouth rinses after 24hours and no direct brushing of the surgical site for one week . All subjects will prescribe oral antibiotics. Azithromycin 250mg 1 per day for 3 days will be the medication of choice. An anti-inflammatory (Enantyum 25mg every 8 hours for 3-5 days) will be prescribed to all subjects.

10. **Follow up visits:** 2 weeks (photo and patient questionnaire), 4 weeks (photo and patient questionnaire), 12 weeks (photo and patient questionnaire), 6 months (clinical measurements, photo, peri-apical X-ray, patient questionnaire and intra-oral scan for volumetric changes, professional questionnaire), 12 months (clinical measurements, photo, periapical X-ray, patient questionnaire and intra-oral scan for volumetric changes, professional questionnaire).

11. **Primary endpoint:** the primary outcome will be complete coverage of the recession. Time frame: 6 months and 12 months with a periodontal probe and intra-oral scanning file (STL) and digital software overlapping different files.

12.Secondary endpoints:

- Reduction of the gingival recession or percentage of coverage of the recessions [Time Frame: 6 months and 1 year] using a periodontal probe and intra-oral scanning file (STL) and digital software overlapping different files.
- Esthetic score [Time Frame: 6 months and 1 year]Esthetic score measured using numeric values from 0 to 10

- Patient-reported post-operative pain [Time Frame: 2 weeks]Patient-reported post-operative pain, based on VAS scale, measured as numbers from 0 to 10.
- Patient satisfaction: [Time Frame: 1 year] based on VAS Scale, measured as numbers from 0 to 10.
- Keratinized tissue width (KTW) gain [Time Frame: 6 months and 1 year]KT gain measured in mm with a manual periodontal probe
- Keratinized tissue thickness (KTT) [Time Frame: 6 months and 1 year]KTT gain measured in mm an intra-oral scanning file (STL) and digital software
- Professional-reported esthetics [Time Frame: 6 months and 1 year]Blinded examiner reported esthetics measured using numeric values from 1 to 5

13. **Indication:** multiple adjacent (at least 2) gingival recessions with inter proximal attachment loss (RT3 from Cairo et al 2011 classification)

14. **Sample Size calculation:** calculated number: 40 patients.

15. **Rationale:** To calculate the sample size, the reduction of recession was used. For the standard deviation, a value of 0.38mm was used (CAIRO 2016). The minimum value considered statistically significant for the difference in recession reduction was 0.5mm, with an alpha error of 0.05 and a statistical power 0f 90%. Considering dropout rate of 30%, there were a total of 40 patients, 20 per group.

Relevance of the project:

There is no enough evidence in the treatment of multiple adjacent gingival recessions in teeth with inter proximal attachment loss and scientific literature in this field reports heterogeneous outcomes in terms of clinical outcomes with non superiority of different surgical approaches or flap designs. Furthermore there is no evidence supporting the clinical benefit and patient perception when using different biomaterials or soft tissue substitutes in these type of situations. The hypothesis of this study is that the use of acellular dermal matrix in the treatment of multiple adjacent gingival recessions with inter proximal attachment loss reduces the patient morbidity, surgical intervention time and offer non inferior clinical outcomes. Furthermore, intra-oral scan, digital tools and software will be used to measure diferente clinical variables in order to improve the quality of data acquisition and precission in this type of clinical research.

Summary for public information:

The treatment of multiple adjacent gingival recessions in teeth with inter proximal attachment loss is probably one of the most challenging situations in the field of periodontal plastic surgery. Furthermore, usually these clinical condition is combined with reduction of keratinized tissue and vestibulum depth. Several surgical approaches have been proposed to treat these recessions with heterogeneous results. Recently, scientific literature has reported that apical buccal access flap combined with an autologous connective tissue graft could be a successful surgical design. Nevertheless the quantity of connective tissue graft for multiple adjacent gingival recessions is high and the use of different substitutes as acellular dermal matrixes is associated with lower patient morbidity. The aim of this prospective randomized clinical trial is to evaluate the clinical efficacy and patient perception with the use of an acellular dermal matrix called Oracell® combined with apical buccal access flap in terms complete root coverage, reduction of the recession or percentage of coverage and changes in volumetric terms, keratinized tissue width and thickness and patient perception and reported measurements.