

Evaluating the Efficacy of Advanced Platelet-Rich Fibrin with Vestibular Incision Subperiosteal Tunnel Access Technique in Treating Cairo Class I Gingival Recession: A Clinical Study

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Abstract

Background: The study's objective was to assess the clinical outcomes of Advanced Platelet-rich fibrin (A-PRF) used in conjunction with Vestibular Incision Subperiosteal Tunnel Access (VISTA) in treating Cairo Class I (RT1) gingival recession.

Materials and methods: The study included 12 participants with multiple adjacent gingival recessions in Cairo's Class I (RT1). The surgical intervention was conducted using the VISTA technique in combination with advanced platelet-rich fibrin membrane and the results were monitored for 3 months postoperatively.

Results: The study found that the A-PRF group had significantly better improvements in the gingival index (GI) and plaque index (PI) at 3 months postoperatively but with no statistically significant difference.

Conclusion: the A-PRF membrane appeared a favourable option in combination with the VISTA technique. and could serve as a cost-effective alternative for treating multiple gingival recessions.

Keywords: Vestibular incision subperiosteal tunnel access; Advanced platelet-rich fibrin; Gingival recessions.

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I. Introduction

Gingival recession is defined as "the migration of the gingiva to a point apical to the cemento-enamel junction." It may also be called "Periodontal recession" since the gingiva's apical displacement will result in periodontium loss. Gingival recession is a frequently encountered phenomenon in individuals, resulting in an unpleasing appearance and heightened root sensitivity. Within the realm of clinical practice, a wide array of cases displays distinct clinical manifestations of gingival recession. Thus, numerous classification systems of gingival recession defects have been proposed over the last few decades. ⁽¹⁾

Gingival recession represents a clinical challenge that necessitates diverse therapeutic interventions with variable efficacy, dependent on the etiology and chosen treatment approach. Zadeh⁽²⁾ recently presented a novel minimally invasive method for addressing multiple gingival recession defects in the aesthetic zones of both the upper and lower jaw called the vestibular incision subperiosteal tunnel access (VISTA) technique.

Platelet-rich fibrin (PRF) has emerged as a potential alternative therapeutic approach for gingival recession. This method offers the advantage of being minimally invasive and does not necessitate an additional surgical site. PRF is a biologically active matrix containing growth factors, platelets, and leukocytes, which can enhance and expedite the healing process of soft tissues. ⁽³⁾

Advanced platelet-rich fibrin (A-PRF) is an adaptation of the conventional PRF technique, distinguished by its heightened release of growth factors, particularly within the initial ten-day period. Scientific evidence indicates that A-PRF exerts a stronger influence on the healing process compared to classical PRF. Moreover, A-PRF is straightforward to prepare and can be applied in various surgical procedures, enhancing its versatility and usability. ⁽⁴⁾

II. Materials and Methods

This study was conducted to evaluate the amount of root coverage using the VISTA technique with the A-PRF membrane for multiple gingival recessions.

The patients who attended the Department of Periodontology and Oral Medicine to seek treatment for multiple gingival recessions Cairo Classification (RT1) The total calculated sample size was 12. After the ethical committee's approval from the institute, an informed consent document from the patients, which explained all procedures involved in the protocol and the possible benefits and harm associated with the proposed study was put forth.

Surgical Procedure:

Participants were subjected to scaling and root planning along with oral hygiene instructions 1 month before surgery. Following oral scrubbing with betadine in both groups, local anaesthesia was administered to patients.

VISTA Technique:

The VISTA approach was initiated by making a vestibular access incision. The location of the access incision was determined based on the specific areas being treated. The midline frenum was chosen for the maxillary anterior region, while the frenal area between the canine and lateral incisor was selected for the maxillary posterior region. In cases involving the mandibular anterior and posterior regions, the area between the canine and lateral incisor was considered. The access incision was performed by cutting through the periosteum to create a subperiosteal tunnel. This tunnel allowed for the exposure of the facial bony plate and any areas where the roots were exposed. In cases where multiple gingival recessions required root coverage, the tunnel was extended to mobilize the gingival tissues and allow for coronal repositioning using the VISTA kit (Devmed Tunnel Inst).

The A-PRF (Advanced Platelet-Rich Fibrin) membrane was trimmed to fit the dimensions of the surgical area. It was adjusted to extend at least 3-5 mm beyond the bony dehiscence that was covering the root surfaces. Each tooth was prepared for the attachment of sutures. The facial enamel surface of each tooth was briefly acid etched for less than 5 seconds, thoroughly washed, and dried. To prevent the apical relapse of the gingival margin (GM) during the initial stages of healing, the 5.0 monofilament polypropylene sutures were secured to the facial aspect of each tooth by applying a small amount of flowable composite resin over the knot. The access incision was then closed and sutured using multiple 5.0 monofilament polypropylene sutures, with a periodontal dressing placed. Sutures at the access incision were removed after one week. The coronally anchored bonded sutures were typically removed during the postoperative visit at three weeks to allow for the immobilization of the gingival margin.

Post-Operative care:

All subjects were provided with postoperative pain relievers, to be taken three times a day for three days. They were also prescribed antibiotics (amoxicillin 500 mg) to be taken three times a day for three days. Routine postoperative instructions were given to the patients. They were advised not to brush their teeth at the surgical site for four weeks. Instead, they were instructed to rinse their mouth with a 0.2% chlorhexidine gluconate mouthwash daily for six weeks. The patients were specifically instructed to notify the healthcare provider immediately if the periodontal dressing became displaced within less than two weeks. After 3 weeks, patients were recalled for the removal of midline sutures and composite bonded sutures.

Periodontal parameters:

With the aid of a periodontal probe, these clinical measurements will be recorded at preoperative and 3 months postoperative:

- 1) Plaque index (PI).
- 2) Gingival index (GI).

Statistical analysis

Data was analyzed using SPSS (Statistical Package for Social Sciences) version 28. Qualitative data was presented as numbers and percentages, Quantitative data was tested for normality by the Kolmogorov-Smirnov test and then described as mean and standard deviation for normally distributed data and median and range for non-normally distributed. The appropriate statistical test will be applied according to the data type with the following suggested tests: Chi-Square for categorical variable.

III. Results:

Twelve patients were included in the current study. The recession defects were classified as Cairo class I (RT1). Table (1) demonstrated no significant differences in the gingival index (GI) and Plaque Index (PI) between and within the study group at baseline, 3 months, with the A-PRF group showing a slight improvement in GI after 3 months.

Table (1): Comparison between the two studied groups of clinical parameters in each period:

Parameter	Baseline	3 months	P value
Gingival index (GI)	0.36 ± 0.12	0.28 ± 0.09	0.117
Plaque Index (PI)	0.49 ± 0.17	0.46 ± 0.15	0.849

SD: Standard deviation.

N. S: no significant difference.

p: p-value for comparing between three periods.

IV. Discussion:

Obtaining full root coverage for gingival recession defects is a complex task in periodontal treatment because of the high occurrence, potential complications of surgery, and the expertise needed for successful connective tissue grafts. Therefore, it is important to evaluate alternative options to CTG in periodontal plastic surgery.⁽⁵⁾ This study was for the assessment of using A-PRF as graft materials alongside the VISTA technique for treating multiple gingival recessions.

The study included participants who underwent rigorous medical screening to confirm their suitability for periodontal surgery and minimize risks. Additionally, individuals with no history of recent periodontal surgery at the treatment site within the last 24 months were chosen to uphold the treatment plan's effectiveness.

The research revealed no statistically significant difference in gingival index (GI) at baseline, 3 months. Nevertheless, the study group exhibited notable enhancements clinically in GI, suggesting that the healing process was accelerated and improved by the anti-inflammatory growth factors released from A-PRF.⁽⁶⁾ A-PRF has the potential to enhance angiogenesis and neovascularization by releasing pro-angiogenic factors in the early stages of wound healing, leading to a quicker healing process. Vascular Endothelial Growth Factor (VEGF) plays a role in promoting angiogenesis by stimulating the migration and division of endothelial cells, forming blood vessel lumens, and attracting macrophages and granulocytes. These data agreed with those published by Tadepalli, A. et al.⁽⁷⁾

Regarding the Plaque Index (PI) results, there were notable PI improvements after 3 months due to regular monitoring and improved oral hygiene guidance. These results indicate the potential of A-PRF and n as beneficial additions to standard periodontal treatment.

V. Conclusion

The data presented in this study suggested that the VISTA+A-PRF techniques had a good influence on improving the gingival condition. In summary, VISTA+A-PRF could serve as an alternative to conventional techniques, but further research is required to verify these results and determine the optimal combination of materials for treating gingival recession.

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