Fibrin-assisted soft tissue promotion (FASTP) as a simple root coverage technique: A case report

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Abstract

Objective: This article presents fibrin-assisted soft tissue promotion (FASTP), a simple root coverage surgical procedure associated with the use of A-PRF as a source of autogenous growth factors that allow the recipient soft tissue to promote the fabrication of new keratinized and attached tissue without a donor site.

Methods: A 20-year-old non-smoker female patient was referred to the Universitas Airlangga Dental Hospital with a chief complaint of tooth hypersensitivity to cold stimuli at the posterior right maxilla and mandibular. A 1-1.5 mm gingival recession was found on the buccal aspect of teeth number 14, 15, 44 and 46. A final diagnosis of clinically healthy gingiva on reduced periodontium in a non-periodontitis patient was made. The treatment plan included dental health education with a focus on brushing methods and scaling procedures that were performed as non-surgical therapy. A FASTP procedure was planned for root coverage treatment on the buccal aspect of teeth number 14, 15, 44 and 46.

Results: A 1-year evaluation was done and showed complete root coverage with an acceptable gingival phenotype.

Conclusion: FASTP is a simple root coverage surgical technique without harvesting tissue from a donor site, thereby decreasing procedure-related morbidity. Case selection plays an important role in proper surgical technique consideration.

Keywords: A-PRF, FASTP, Gingival recession, Root coverage, Human and health
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Introduction

Gingival recession is a periodontal disease that most commonly affects adults, worsens with age, and affect people with high and low standards of oral hygiene.1,2 According to recent research, 88% of adults aged 65 and 50% of those aged 18 to 64 have one or more sites of gingival recession.3 Gingival recession is clinically significant for several reasons. Gingival recession can affect the appearance of a smile, which many patients find undesirable; it can also lead to dentin hypersensitivity. This causes the root surface to expand, exposing it to the oral environment, and is associated with non-carious cervical lesions such as abrasion or erosion.4,5

Gingival recession in untreated facial areas in subjects with good oral hygiene is very likely to result in an increase in the severity of the recession in the long term. The increasing life expectancy and the need for people to retain more teeth cause gingival recession to raise more problem that will be experienced more often in the population, so aspects of prevention and treatment of gingival recession need to be of particular concern in the field of periodontics.4,5

Various methods of plastic and aesthetic periodontal surgery have been offered to treat attachment loss and correction of soft tissue deformities, both associated with the use of self-or donor-derived connective tissue. However, the concern of patient safety, the increasing possibility of morbidity and the high cost of treatment are problems for each treatment method.6-8

On this article we describe the fibrin-assisted soft tissue promotion (FASTP), a simple root coverage surgical procedure associated with the use of A-PRF as a source of autogenous growth factors that allow the recipient soft tissue to promote the fabrication of new keratinized and attached tissue without a donor site.7,9,10

Case Report

A 20-year-old female patient came to the periodontics clinic of Universitas Airlangga Dental Hospital with the chief complaint of hypersensitivity in the upper and lower right back teeth, especially when drinking cold drinks. The pain has been felt for the last five months. The patient used special toothpaste for sensitive teeth, but the pain did not decrease. The patient’s medical history and social history were within normal limits and did not contribute to the disorder complained in dental history, the patient had the habit of brushing his teeth in a back and forth motion.

Extra-oral examination results were within normal limits. On intra-oral examination, a gingival recession was found on the buccal side and there was no calculus and bleeding on probing of teeth number...
Table 1. Classification of mucogingival conditions and gingival recessions

<table>
<thead>
<tr>
<th>Teeth</th>
<th>RT</th>
<th>RD (mm)</th>
<th>GT (mm)</th>
<th>KTW (mm)</th>
<th>CEJ (A/B)</th>
<th>Tooth Site</th>
<th>Step (+/-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>RT 1</td>
<td>1.5</td>
<td>&gt;1</td>
<td>3</td>
<td>A</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>RT 1</td>
<td>1</td>
<td>&gt;1</td>
<td>3</td>
<td>A</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>RT 1</td>
<td>1.5</td>
<td>&gt;1</td>
<td>3</td>
<td>A</td>
<td>-</td>
<td></td>
</tr>
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</table>

RT = recession type, RD = depth of the gingival recession, GT = gingival thickness, KTW = keratinized tissue width, CEJ = cemento-enamel junction (Class A = detectable CEJ; Class B = undetectable CEJ); Step = root surface concavity (Class = absence of a cervical step > 0.3 mm; Class = presence of a cervical step > 0.3 mm)

14, 44, and 46 figure 1 and figure 2. The assessment of the recession condition and gingival phenotype was carried out using the UNC15 probe.

The condition of the teeth and other periodontal tissues was within normal limits. The final diagnosis according to the new classification was gingival health in a reduced periodontium in a non-periodontitis patient, with a good overall prognosis.

The treatment plan included DHE for a proper tooth brushing technique using the modified Stillman method and a scaling root planing procedure as a phase I (non-surgical) treatment. In phase II (surgical), coronally repositioned flap treatment with the FASTP concept was planned in areas experiencing a gingival recession and periodic control was planned in the maintenance phase.

Following the evaluation of the non-surgical phase and during the maintenance phase, the surgical phase of treatment was carried out. To get consent for the action, the patient was given an explanation. The surgical therapy was divided into two stages, with the first being the treatment of region 14, followed by the treatment of regions 44, 46. Before surgery, phlebotomy was used to prepare 30cc of A-PRF (figure 5), which was then divided into three tubes without EDTA. The second phlebotomy took up to 10cc to make I-PRF 15-20 minutes before application. Before local anesthetic (Lidocaine HCl + Epinephrine 1:80,000), intra- and extraoral asepsis with 10% povidone-iodine was conducted.

Root surface biomodification was carried out mechanically by curettage and biochemically by using a 100mg/ml tetracycline/NaCl solution of 0.9%. A sulcular incision was made using an MB64 microblade (Hu Friedy, USA), and tunneling was performed using a TKN 1 blade (Hu Friedy, USA). The tunnel access that had been made was checked using the UNC 15 Probe. 3 layers A-PRF membrane were applied to the tunnel area and fixed with horizontal sutures in the facial area. The flap margins were coronally 2 mm from the CEJ using composite-fixed sutures. The interdental area was fixed using a sling suturing technique with nylon material. Apply I-PRF by injection through the sulcular area.

Treatment in the teeth number 44 and 46 regions was carried out using the Zucchelli technique, incision, using the interdental papilla area as an anchor, and fixation with a sling suturing technique. After the surgery, the patient was instructed to take mefenamic acid 500 mg if necessary and amoxicillin 500 mg 3 times a day for 5 days. Patients were instructed to rinse their mouths with 0.12% chlorhexidine twice daily for 10 days. Periodic controls were carried out 1 week and 2 weeks after surgery. Suture removal was performed in the second postoperative week. The 1-year postoperative control showed complete root coverage with an adequate gingival phenotype and non-reversed tooth hypersensitivity.

Discussion

The basic mechanism of the Fibrin-Assisted Soft Tissue Promotion (FASTP) technique is referred to as fibro-promotion. The concept of fibro-promotion is a concept whereby PRF will promote and encourage the formation of vascularization and new tissue at the recipient site. The quality of the results is highly dependent on the recipient tissues. If the receiving tissue has a large area of keratin, then the tissue will be triggered to form more keratinized tissue. If the receiving tissue is loose connective tissue, the quality of the resulting tissue will also be poorer than that of
keratinized tissue. This condition is different from the concept of using a connective tissue graft (CTG) as the gold standard to change the gingival phenotype. Connective tissue grafts taken from the palate will transfer their genetic expression (keratinization) from the donor area to the recipient area. The receiving area plays less of a role in the quality or quantity of the final tissues obtained.1,6,10,15

Platelet-rich fibrin (PRF) is a second-generation platelet concentrate prepared by single centrifugation without the use of anticoagulants. The obtained PRF is a physiological tridimensional matrix saturated with platelets and leukocytes. Alpha granules secreted by platelets and trapped in the membrane will secrete growth factors to form a natural and slow rate of membrane resorption (about 15 days). The released growth factors include platelet-derived growth factor (PDGF), transforming growth factor-β (TGF-β), vascular endothelial growth factor (VEGF), epidermal growth factor (EGF), and insulin-like growth factor-1 (IGF-1).1,6,10,15

A-PRF is based on the same protocol as PRF, but the tubes used are changed from plastic to glass to increase the chelation effect, and centrifugation and spin times are reduced from 2700 rpm/12 min to 1300 rpm/8 min. By changing these two parameters, the A-PRF membrane contains an increase in VEGF, which plays a role in accelerating the formation of neovascularization, and monocytes, which plays a role in the release of BMP and extracellular matrix (fibronectin).20,21 Injectable PRF (I-PRF, 700 rpm/3 min) can induce fibroblast migration and release high concentrations of growth factors such as PDGF, TGF-β, and collagen type I, which can promote soft tissue healing, which is critical in the management of gingival recession.15

The clinical application of the FASTP technique requires two basic aspects of understanding, namely the mechanism of action and biological principles of PRF and the surgical technique required to meet the criteria for flap relaxation, ease of placing the membrane on the surgical surface, changes in the physiological position of the flap (biotensegrity) and flap closure without tension.7,9,15

The use of A-PRF as a fibropromotion agent requires a maximum number of platelets and leukocytes to increase the quantity of growth factor produced. Growth factor A-PRF will be absorbed within 15 days. The use of three to four A-PRF membranes is recommended to increase the results achieved. Using three to four layers of membrane and a pressure-free flap area helps to coronalize the flap margins when the tunnel technique is chosen and the outcome of fibropromotion can be more clinically predictable.7,9,15

Case selection is the key to selecting a treatment plan using the FASTP technique. In the
surgical technique of root closure due to gingival recession, it is important to obtain a flap thickness of more than 0.8 mm, tension-free (±0.4 g) flap closure, and be able to position the gingival margin of 1.5-2 mm coronal to the CEJ. The flap design without vertical incisions can reduce trauma, reduce postoperative discomfort, increase the ability of complete root coverage, and reduce the risk of scar tissue formation, thereby improving esthetics.1-22

Conclusion
FASTP is a simple root coverage surgical technique without the need to harvest tissue from a donor site, thereby decreasing procedure-related morbidity.

Case selection plays an important role in proper surgical technique consideration.

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Conflict of Interest
The authors report no conflict of interest

References