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Treatment of Gingival Recession by Platelet-Rich Plasma

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Abstract

Gingival recession is one of the most important esthetic problems for dentists. Several methods have been used in dealing with and covering gingival recession-exposed root. This article aimed to study the treatment of gingival recession using platelet-rich plasma. 155 patients at the University of Dentistry in Baghdad, Iraq at Period ontological Clinic performed this clinical study. Each patient was systemically healthy and did not have a significant history of systemic disease. The baseline plaque index and gingival index were not statistically significantly different to the postoperative index observed. At the end of 3 weeks, the baseline depth dropped gradually to three and two weeks, and the P-value dropped moderately significantly by 0.019. The average sampling depth at 1 week was 1.57 mm (0.13 mm below the base line) and 1.07 mm (0.63 mm below) and 0.81 mm (0.89 mm lower) at 2 weeks at the end of the 3-week period. Predictability data showed that 90% or more defect coverage was attained 39% of the time. Plasma rich in platelets can be applied instead of surgery in certain cases of gum recession. She is autologous, does not have postoperative pain or complication associations, is considered free of cross infection and is less expensive for the patient. Taking into consideration the comprehensive available information on the properties of PRP and improved clinical parameters, it may be considered useful to treat the gingival recession in conjunction with collagen sponge. Amina fluoride, and stannous fluoride rinses and toothpastes have been found to control gingival recession plaque buildup in aggressive periodontitis in addition to mechanical oral hygiene procedure for gingival recessions.

Keywords: Gingival recession, Platelet-rich plasma, Treatment, Plaque, Patient, Periodontitis

Introduction

The gingival recession (GR) is defined by denuding a root surface of the marginal part of the genome as transition to the cement-enamel connection. Anatomical, pathological, and traumatic conditions cause gingival recession (AKcan and Ünsal, 2020).

One of the most important esthetic issues for dental patients is the gingival recession. Various methods were used to deal with and cover the root exposed to gingival recession. Most of these are surgical techniques. A new non-surgical technique is to use plasma rich in platelets to cover the exposed root (Ali et al., 2018).

Gingival recession is due to a loss of periodontal attachments and currently is a common clinical finding that the Gingival Margin in relation to the cement enamel junction (CEJ) is displaced apically. Gingival recession is etiologically related to periodontal disease, poor oral hygiene, frenulum dehiscence, improper tooth rash, dental malposition, gum infections and an accumulation of subgingival plaque (Ahrari et al., 2020). In the course of the gingival recession tooth-brushing trauma, particularly in young people, can play a role. The recession of Gingival can compromise esthetics and affect chewing function (Ahrari et al., 2020).

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Gingivitis, which is directly associated with dental plaque, is 70% –100% of the world's population for oral health reasons. Gingivitis can develop inappropriate orals and eventually affect the entire periodontal adhesive system of the teeth, leading to additional harmful consequences, including periodontitis, tooth loss and lower quality of life. Gingivitis can be reversible through plaque control. Efficient plaque control thus plays an important role in the resolution and prevention of gingivitis and associated conditions (Cai et al., 2020).

Gingival recession is root exposure due to apical migration to the cement enamel junction of the gingival margin. Gingival recessions, like periodontal diseases, aggressive and incorrect brushing of the tooth, traumatism or dominant roots, could be caused by several causes (Ali et al., 2018). Gingival recession can lead to tooth hypersensitivity, pain and difficulties in oral hygiene procedures, caries of the radical surface, anesthetic gingival and loss of periodontal fixation (Jenabian et al., 2018).

Given the advantages of PRGF over other techniques of isolating growth factors, the additional use of PRGF can be a possible option if additional biological factors are warranted (Jenabian et al., 2018).

Plasma-rich platelet (PRP) is a material used for repairing and preventing periodontal complications of the second molar distal root next to the third molar extracted. It contains many autological growth factors such as PDGF and transforming growth factor (AKcan and Ünsal, 2020). This includes a number of factors.

Platelet concentrates (PCs) are used to promote healing and promote regeneration in the field of periodontics treatments for key cells and growth factors. The slow dissolution and long-lasting structure of the fibrin network have been demonstrated by platelet-rich fibrin (PRF). Structures such as (AKcan and Ünsal, 2020) provide a matrix containing large numbers of growth, thrombocytes and leucocytes.
Treatment with the aim of completing root coverage of multiple adjacent gingival recessions (MARRs) poses specific clinician challenges. A number of periodontal surgical techniques for MAGRs, including advanced coronary flaps, with or without connective tissue graft (CTG), modified CAFs and modified cardiovascular tunnel techniques, were proposed. A number of different methods have been suggested. Lately, autologous platelet-rich plasma (PRP) has suggested that regeneration and healing of wounds can be increased and speeded up because of the different growth factors it contains (Çetiner et al., 2018). Hence, this research article aimed to investigate the treatment of gingival recession by platelet-rich plasma.

Methodology

Study Design

This clinical study was carried out by 155 patients at the College of Dentistry University of Baghdad, Iraq, at the Periodontology Clinic. Between 15 and 50, there were 90 men and 65 women. Every patient has completed a general medical history, age, sex and smoking questionnaire prior to their selection. Every patient was systemically healthy and had no significant systemic disease history. In the same way, all patients received complete mouth and periodontal exams. Periodontitis was not diagnosed for patients. Professional dents consisting of prophylaxis, scaling, root planning and oral sanitation instructions were received to all patients. The study features were reported to the patients and the procedures were approved in writing (Çetiner et al., 2018).

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PRF protocol

A 10 mL tube containing anticoagulants was taken to the blood and immediately centrifuged in 3000 rpm for 10 minutes (about 400 g). The PRF centrifuge blood processing permits articulated fibrin coagulation to composition in the center of the tube between the bottom red body and the top acellular plasma. By removing the serum from the coagulum to the resistant autologous fibrin membrane, the collection of PRF was facilitated (Çetiner et al., 2018).

Pre-treatment procedures

The pre-operative assessment included an analysis of the dental brushing techniques and practices of the patient. A soft technology for toothbrush guiding has shown that trauma from tooth brushing to gingival margins on teeth have been reduced. Pre-operative therapy included scale, root plan, polish and oral hygiene in general. The level of the interproximal alveolar bone has been assessed through pre- and postoperative standardized radiographs. It was not planned until a plaque or bleeding was inserted to test for recession defects (Verma et al., 2019).

Surgical protocol

The exposed root regions have been scaled and flattened in both groups after adequate anesthesia by hand and ultrasound instruments. The initial intramuscular inspections in the recipient area were placed in the neighboring interdental papilla on or slightly coronally to the radiation surface exposed by the CEJ. A full-thickness flap was reflected beyond the clot and 5 mm apical to the apical osseous dehiscence episode. The flap has been released by sharp dissection. The mesiodistal incision was extended to the nearest angle of the most distal teeth. The mesial and distal vertical release incisions were followed by each procedure. The PRF membrane was positioned and stabilized with a horizontal mattress suture at the specified position. In the treated areas the flap was positioned to completely cover the PRF membrane with a vertical mattress suture and periodontal dressing. Sutures were removed 3 weeks after the surgery. All patients had 0.12% mouth rinse chlorhexidine for 3 weeks and should follow postoperative routine instructions for cystic operation (AKcan and Unsal, 2020).

Post-surgical care

It was said that few weeks after the surgery they stopped brushing around the surgical sites. The plaque control was performed twice a day using a serum physiological rinsing during this post-chirurgical stage. As analgesics for postoperative disorder, no steroidal antimicrobial products were prescribed. After 21 days, the sutures were taken out. The patients were instructed to continue with a soft toothbrush and rolling technology mechanical dental purification in the treated areas a month after the operation. All the patients were recalled once weekly in the first month, quarterly to the third month, once per month prior to the end of the professional prophylaxis and plaque control test (Elkhatat, 2017).

Results

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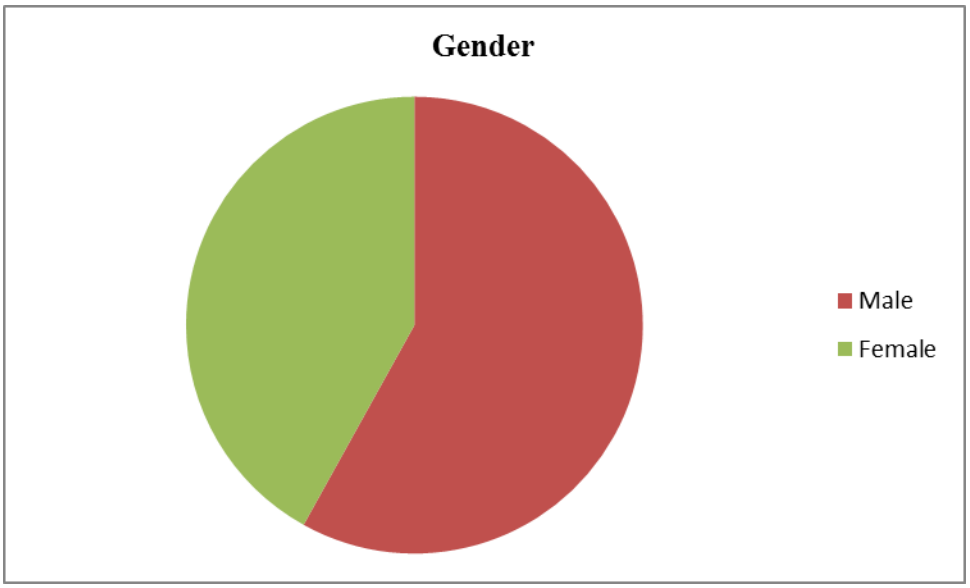

Figure 1: Respondents' gender percentage

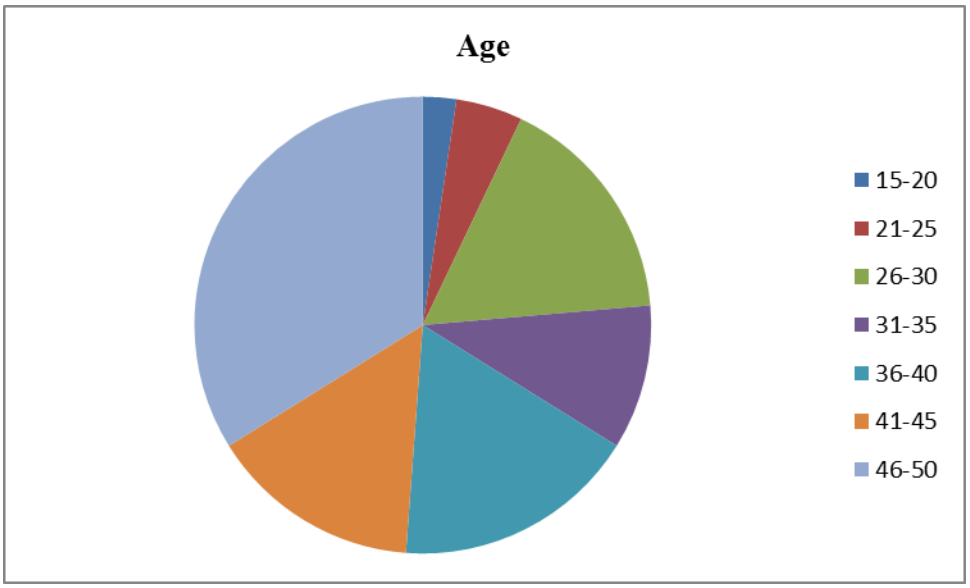

Figure 2: Respondents' age percentage

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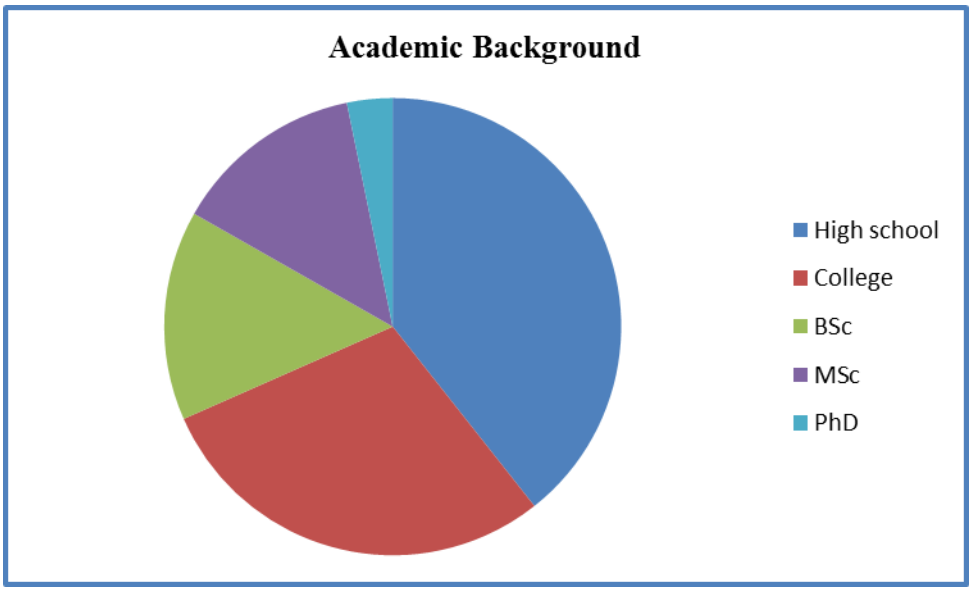

Figure 3: Academic background percentage of respondents

Table 1: Plaque Index

Study period	**Range**
Baseline	0.0-0.75
At 1 weeks	0.0-0.75
At 2 weeks	0.0-0.75
At 3 weeks	0.0-1.00

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Table 2: Gingival Index

Study period	**Range**
Baseline	0-0.50
At 1 weeks	0-0.75
At 2 weeks	0-0.50
At 3 weeks	0-0.50

Table 3: Treatment of Gingival **Recession using Platelet-rich plasma**

Gingival Treatments	**Baseline**	**1 weeks**	**2 weeks**	**3 weeks**
Probing depth	1.70 ± 0.56^{a}	1.57 ± 0.47^{ab}	1.07 ± 0.49^{c}	0.81 ± 0.37^{cd}
Clinical attachment level	3.97 ± 0.64^{a}	2.63 ± 0.88^{b}	2.10 ± 0.76^{c}	1.43 ± 0.49^{cd}
Recession width	2.63 ± 0.52^{a}	1.47 ± 0.97^{b}	1.57 ± 1.03^{bc}	0.94 ± 0.82^{bcd}
Recession depth	2.33 ± 0.41^{a}	0.87 ± 0.67^{b}	0.80 ± 0.62^{bc}	0.50 ± 0.53^{bcd}
Surface area	5.27 ± 0.73^{a}	2.20 ± 1.87^{b}	2.63 ± 1.04^{bc}	1.63 ± 1.51^{bcd}
Width of keratinized gingival	2.63 ± 0.66^{a}	3.27 ± 0.49^{b}	3.43 ± 0.46^{bc}	3.50 ± 0.46^{bcd}

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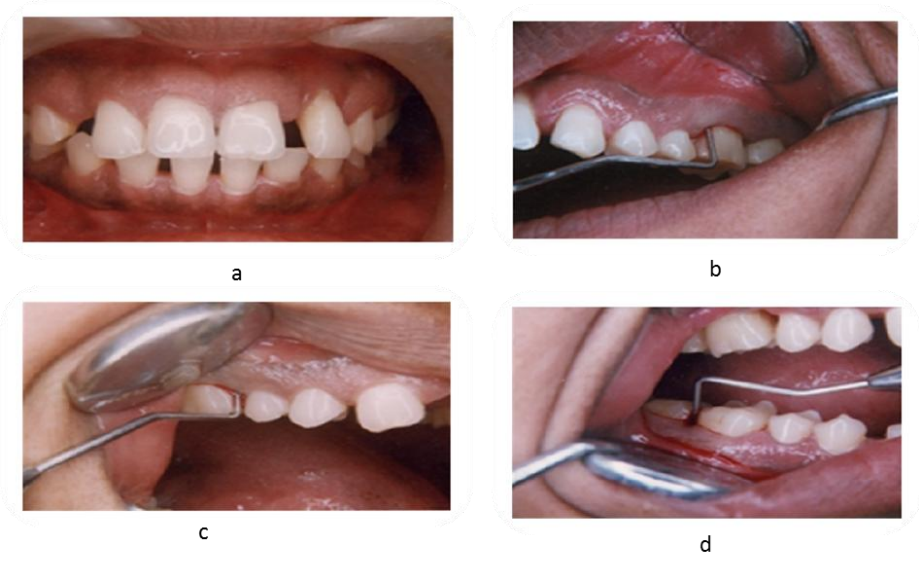

Plate 1: There were deep pockets, although signs of inflammation were absent other than bleeding during testing

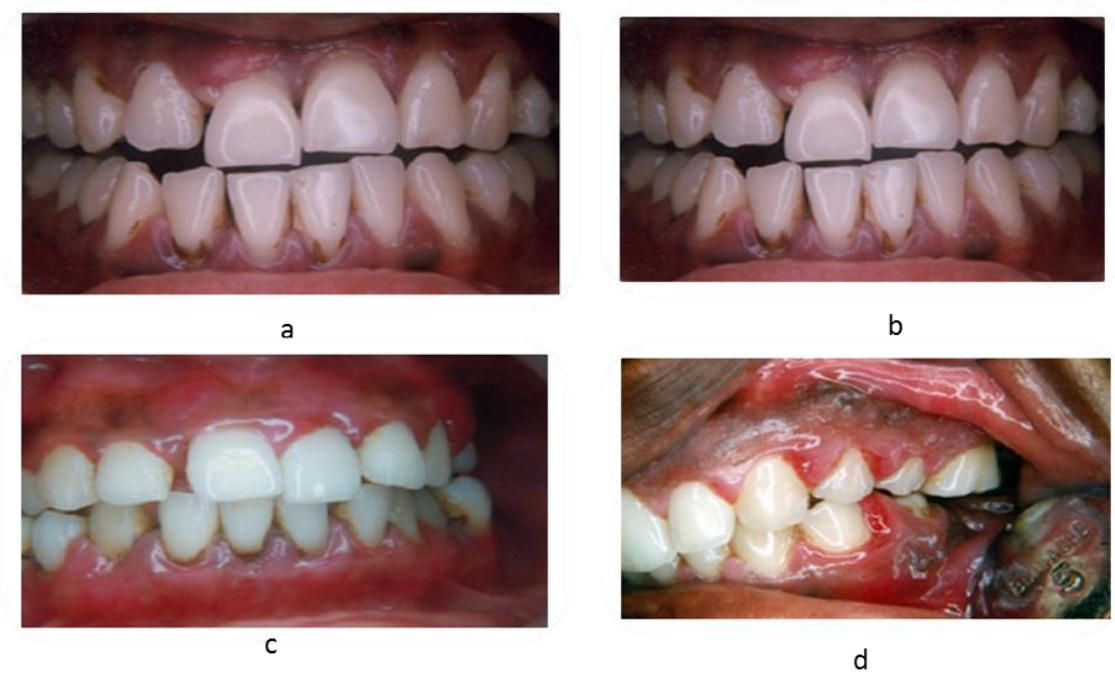

Plate 2: Severe inflammatory gingival characteristics in active disease

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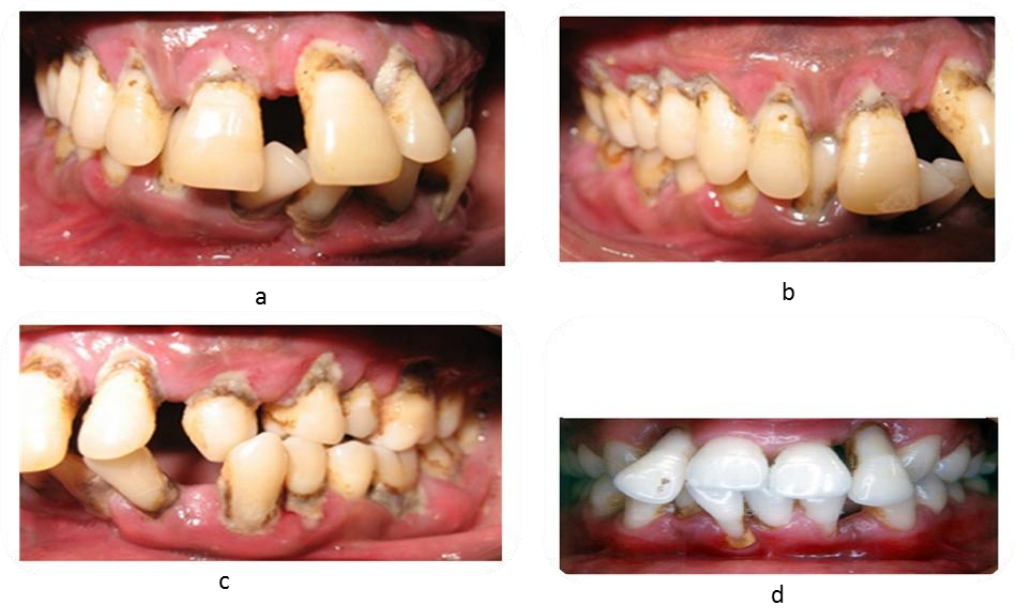

Plate 3: Clinical and radiographic appearance of poor oral hygiene demonstrating severe periodontal destruction

Discussion

The demographic study of these findings is shown in Figures 1 – 3. Figure 1 indicated that the gender percentage of the respondents is higher than that of women. Figure 2 shows that the age of participants in the study ranges from 15 to 50 years. The academic background of high school to PhD respondents was shown in Figure 3 of the study. The figure showed the highest proportion of high school participants and the secondary school, so PhD has the lowest proportion of high school students.

In the postoperative period there was no increase beyond 0.5 in the postoperative defect specific plaque index and gingival index. The plaque index and gingival index at the baseline did not differ statistically significantly from that observed postoperatively (P =.584 and P =0.274, respectively) (Tables 1 and 2). A gradual decline in the baseline depth to 3 and 2 weeks and a moderately significant decline in the P value of 0.019 were achieved at the end of 3 weeks. At 1 weeks, the average sampling depth was 1.57 mm (0.13 mm less than at base line), while at the end of the 3-week period it was 1.07 mm (0.63 mm lower) and 0.81 mm (0.89 mm lower) at 2 weeks (Table 3). CAL was 3.97 mm in the mean baseline. At the average of 1 week, the CAL of 2.63 mm was 1.34 mm. The average CAL was 2.10 mm and 1.43 mm at 6 and 3 weeks, respectively, with a fixing gain of 1.87 mm. The mean CAL for 2 weeks was 2.10 mm, showing a 1.87 mm increase in fittings. At the time of three weeks the average CAL was again 1.43 mm with an additional 2.54 mm. The change in $P < 0.001$ was extremely important (Table 3). In the baseline, average RW was 2,63mm, which decreased by 1 week to 1,47 mm, 2 weeks to 1,57 mm and 3 weeks to 0,94 mm. The decrease in RW was extremely marked ($P<0.001$), with a decrease in RW of 61.3% in 3 weeks (Table 3). At baseline the mean recession depth decreased at 1 week to 0.87 mm and at 2 weeks to 0.80 mm. At 3 weeks, recession depth decreased

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substantially to 0.5 mm. The decline in the depth of the recession was very significant (P<0.001) and 78.5% improved at 9 months (Table 3). SA was 5.27 mm2, down to 2.20 mm2 in 1 week and 2 weeks after surgery, down from 2.500 mm2. In addition, mean SA decreased considerably at 3 weeks to 1.63 mm2 (69.1% declining) P < 0.001; (Table 3). The baseline medium width of KG was 2.63 mm. The width rose to 3.27 mm and 3.43 mm over 2 weeks at a mean time of 1 week. The width was raised to 3.50 mm at the end of 3 weeks. The change was very significant, P < 0.001 representing a 33.1 percent increase in KG gain (Table 3).
Data of 2 weeks and 3 weeks show that CAF PRP operations are as effective as the other root coverage procedures. At 2 weeks the average roots coverage was 65.33% and at 3 weeks 78.75%. Studies reveal average defect coverage of 50% to 98% with an average of 78% for all studies. Data for predictability showed that 90% or greater coverage of defects has been achieved 39% of the time.

The patient has been motivated by a thorough gingival scaling to improve plaque control. The patient was educated on the use of an interdental cleaning device, including dental flows and interdental brushes. Additional help in plaque control for the washing of the chlorhexidine mouth was recommended (Ali et al., 2018). The patient was recalled after a three week treatment response assessment and systemic antibiotic products were prescribed (Amoxicillin, and Metronidazole, 250 mg each threesome daily). The patient was trained to maintain oral hygiene by means of gingival scaling. After a gingival scaling the patient was told to continue washing the mouth of chlorhexidine. The re-evaluation showed a worsening of the test depth and a lack of bleeding during the test 3 weeks after a subgingival scaling (Chambrone et al., 2019).

Bone grafts with vertical or intrabony defects were mainly detected in molar areas involving the surgical surgery of four-sided full mouth flap. In the molar regions, a modified Widman flap procedure with bone substitution grease was performed while the sulcular incision flap (Kirkland flap) was performed in the maxillary and anterior jaw areas to minimize the post-cure recession for esthetic purposes (Miron et al., 2017).
An antimicrobial rinse has been performed to minimize bacteria in the mouth. After a proper anesthetic of the surgical site with infiltration anesthesia and nerve blocks, the first cut (internal bevel incision) was taken 0.5 meters from the gingival margin to the alveolar crest. The flap was found to remove the tissue wedge following the lay incision and interdental incision. After sub-aging deposition and root planning, Curettage was conducted for the removal of granulation tissue (AKcan and Unsal, 2020). For root conditioning, the defect was irrigated using normal saline and tetracycline. The grease was a xenograft, blended with blood from an operating site and placed into the defect after stitching with silk sutures. The sniper used to be the graft. Please make sure to fill the graft at a realistic level rather than over pack the defect. After the oral and lingual flats were well adapted, suturing was done. Periodontal packaging was put in place and 5 days of patient prescription for antibiotics and analgesics. The patient was prescribed post-surgical fluoride-containing mouthwash (Isler et al., 2018).
These results are consistent with literature reports for gingival recession treatment with plasma rich in platelets. A statistically significant gain in the KTW was the main finding in this study. Increased KTW in the CTG-Group is linked to a further stability of the injury and fast neoangiogenesis of fibrin fibers (Turer et al., 2020). The improvements made in the PRF group's Healing Index values can also be explained by concentrating PDGF, VEGF and TGF; the key growth factors in PRF. These growth factors could improve soft tissue cure by enhancing the angiogenesis and matrix biosynthesis of the wound. Regardless of the slow release and

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acceleration of regenerative potential of growth factors in PRF mesh, the Fibrin network structure is the essential component of the improved PRF healing process (Isobe et al., 2017).
Although the root coverage is a desirable result, an increased KG zone, reduced test depth and gain in CAL are required. PRP was shown to be rich in growth factors that increase the healing of soft tissues and flap and grafts in root coverage procedures, promoting initial stabilization of cail. However, there is currently limited evidence to verify these claims. This study was therefore carried out to study the CAF effects of PRP (Moraschini and Barboza, 2016).

The results of this survey have shown that the use of PRP in CAF may result in a consistent reduction in RD and significant improvements in root coverage. In this study PRP was prepared 1 hour before surgery and the number of platelets was randomly checked, 4 times the base value. PRP has been verified. This was similar to the value of Marx, showing it is sufficient to generate clinical benefits. The preferred method is because it only takes 8 ml of blood and less time to prepare (Castro et al., 2017).
In all cases the appearance of gingival was nearly normal, varied from "no gingival and a mild edema" to a gingival erythema." Patient discomfort occurred only on the first day and with minimal postoperative pain. This shows that the soft tissue is accelerated. Higher levels of PRP, the changing of growth and VEGF, are known to have a PDGF that is known to enhance soft tissue curing by accelerating angiogenesis and biosynthesis in the matrix during an early wound healing process (El Bagdadi et al., 2019).
During the experimental period, Plaque and gingival indexes remained relatively consistent at all times. Depth testing was considered as an evaluation parameter to detect whether a treatment had a negative effect on the increase of oral test depth. There was a decline in the test depth from the preoperative to postoperative exam of 0.63 mm. This was moderately significant (Kuka et al., 2018).

The differences in results from treatment in the study and other studies can be attributed to technical and anatomical factors. The differences between the researches can also be explained by technical factors such as experience with the operator, operating abilities and the curve during the course of the study (AKcan and Unsal, 2020). Some studies also differ in the methods used for measuring. All these variables were not taken into account and might have had less beneficial results, as well as other anatomical factors such as root prominence, vestibule depths and soft tissue quality. Postoperative assessments showed that the bleeding did not take place in normal testing and testing depths 3 weeks after surgery. The patient received regular recalls of gingival, periodontal status and treatment (El Bagdadi et al., 2019). A 2 weeks after postoperative radiation in molar regions indicated important bone filling where grafting was done in other crest areas with corticated bone formations, with the increase of the bone density of the alveolar crest. The patient had excellent oral hygiene and conformity and there was no evidence of the disease's recurrence throughout the maintenance. Since the patient was interested in the esthetic appearance of the anterior teeth after three weeks of the operation, therapy was advised for adults with a specialist in orthodontics and periodontal monitoring was carried out on a regular basis (Arbildo et al., 2017).

Early diagnosis is essential for successful treatment. Early diagnosis helps prevent progression of disease and therefore prevents further destruction of tissues and alveolar bone loss. The better the forecast for the teeth is the earlier the diagnosis. Furthermore, as the family tends to aggregate, parenthood testing are necessary to support family members in early diagnosis of the disease for

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their siblings and other close parents of the patient. The management of patients with gingival recession is primarily non-surgical treatment and interdisciplinary therapy (Gobbato et al., 2016).

The primary line of antimicrobial therapy is non-operative therapy in gingival recession patients. Nonsurgical therapy with systemic antibiotics as an instrument for mild to moderate periodontal and bone destruction can manage the early stages of disease in complete detail (Stefanini et al., 2018).
Control or removal attempts at etiological agents control and alterable disease risk factors should begin with the therapy. The condition is highly genetically sensitive. Current treatment measures are critical to pathogenesis and the expression of the disease and the genetic determination of the host reaction by the patient or the person susceptible to pathogens. However, due to the influence of microbial and environmental risk factors on the disease expression in sensitive individuals, it can be successfully maintained by controlling microbial and environmental factors. This emphasizes the importance of improved plaque control both by patient methods and by the professional plaque management measures of the dental team. Even a little amount of plaque is sufficient in those disease-prone patients to produce an upswing reaction, whereby a significant emphasis is plaque-controlled in full compensates for the reduced invasion resistance (Culhaoglu et al., 2018).

The successful implementation of mechanically-controlled plaques can be done by training and motivating the patient if necessary by providing improved plaque control solutions, brush demonstration, and the use of interdental cleaning devices, such as dental fluids and interdental brushes. The dental team must support and encourage this behavioral change from the patient. The effectiveness of plaque control measurements by the patient needs regular recall appointments (Oncu et al., 2017).

The smoking of patients who smoking on the affected tooth and loss of clinical attachment are documented as being the main risk factor in aggressive periodontitis, as are patients suffering from gingival recession (Cai et al., 2020). Moreover, both non-chirurgical and surgery, regenerative and implant therapy react to periodontal therapy, but the previous smocks are similar to non-smokers. The therapy effect of a cessation and other forms of tobacco is based on this, and by increasing the periodontal status of patients, it is important to advise on the benefits of cessation of smoking and possible risks related to smoking (Arbildo et al., 2017).

Conclusion

Although the prevalence of aggressive periodontitis is substantially lower than chronic periodontitis, managing aggressive periodontitis as an unalterable risk factor is more challenging than chronic periodontitis. Researchers use a range of new technologies to regenerate pended periodontium, including tissue engineering and genetic engineering. In treating certain gum recession cases plasma rich in platelets can be applied rather than surgery. It is autologous, is not associated with postoperative pain or complication, is considered to be free of cross-infection and costs less for the patient. Considering the extensive information available on the properties of PRP and the improvements observed in different clinical parameters, PRP along with collagen sponge can be assumed to be beneficial for the treatment of gingival recession. A large sample study with histological support requires clinical trials to demonstrate the impact of PRP on wound cure and to support the clinician's search for periodontal regeneration. To implement

additional plate control in chemical insulation agents such as 0.12% or 0.2% mouth cleaning and 1% povidone iodine, the plate controls must be applied. In addition to mechanical oral hygiene procedure in gingival recessions, amine fluoride and stannous fluoride rinses and toothpastes were effectively found to control gingival recession plaque build-up in aggressive periodontitis. Further fluoride washers are recommended to help clean exposed root surfaces and for patients who denounce hypersensitivity the application of desensitizing toothpastes and mouthwashes is required.

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