



Treatment Modalities for Multiple Gingival Recession– A New Prospects

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i631190

Editor(s):

(1) Dr. S. Prabhu, Sri Venkateswara College of Engineering, India.

Reviewers:

(1) Sonu Mishra, Mewar University, India.

(2) Dasan Swaminathan, Malaysia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/65150>

Received 05 December 2020

Accepted 10 February 2021

Published 02 March 2021

Case Study

ABSTRACT

This case series reports the various treatment modalities to treat the multiple recessions. Gingival recession is a widespread clinical manifestation affecting single or multiple root surfaces at all teeth types. Periodontal reconstructive surgery consists of various mucogingival procedures. The primary goal of these procedures is to benefit periodontal health through the reconstruction of lost hard and soft tissues, or by preventing its additional loss, and also enhancing the esthetic appearance. Platelet-rich fibrin is a second generation platelet concentrate and is defined as an autologous leukocyte and platelet-rich fibrin biomaterial. Care was taken not to extend the incisions till the tip of the interdental papilla. A full thickness mucoperiosteal flap was reflected, extending beyond the mucogingival junction. A wide range of surgical techniques has been proposed for the treatment of the gingival recessions, each with its advantages and disadvantages. To provide predictable and long-term results, it is of paramount importance that the surgical technique is individually selected, taking into account several crucial factors such as the size of the defect, the width of the keratinised gingiva apical to the defect and the thickness of the flap.

Keywords: Periodontal health; mucoperiosteal; modalities; platelet-rich fibrin.

1. INTRODUCTION

Gingival recession is a widespread clinical manifestation affecting single or multiple root surfaces at all teeth types [1]. Root hypersensitivity, aesthetic problem and abrasion may accompany gingival recession and lead patients to seek treatment [2]. When multiple Miller Class I and II recessions are present, an approach to address all adjacent defects in one surgical visit is the first choice [3]. The periodontal reconstructive procedures was done to achieve complete and predictable coronal displacement of the gingival margin on all root surfaces.

Periodontal reconstructive surgery consists of various mucogingival procedures. The primary goal of these procedures is to benefit periodontal health through the reconstruction of lost hard and soft tissues, or by preventing its additional loss, and also enhancing the esthetic appearance. In the last years several surgical techniques have been offered with variable clinical outcomes [4].

The various plastic procedures performed to enhance esthetics or relieve hypersensitivity due to exposed root surfaces are, the Laterally Positioned Flap Technique, Free Gingival Graft Technique, Connective Tissue Graft Techniques, Free Gingival Graft/Coronally Positioned Flap Technique, Guided Tissue Regeneration Technique, and the Acellular Dermal Matrix Technique. A recent systematic review reported the best predictability in complete root coverage when adjacent Miller class I and II recession defects were treated by the coronally advanced flap with or without the connective tissue graft [5,6]. However, the disadvantages of using subepithelial connective tissue are the second donor site and difficulty in procuring sufficient tissue for multiple recessions. Hence, various other additive materials are available like the acellular dermal matrix, PRF as a membrane or amniotic membranes.

This case series reports the various treatment modalities to treat the multiple recessions which include

1. Coronally advanced flap with platelet rich plasma
2. Coronally advanced flap with platelet rich fibrin
3. Coronally advanced flap with Amniotic membrane
4. Pouch and tunnel technique

5. Vista technique
6. Free gingival graft

1.1 Case Presentation

1.1.1 Case 1

Platelets contain high quantities of key growth factors, such as PDGF-AB (platelet- derived growth factor AB), TGFb-1 (transforming growth factor b-1) and VEGF (vascular endothelial growth factor), which are able to stimulate cell proliferation, matrix remodelling and angiogenesis. The use of these growth factors to enhance healing is an interesting option [7].

Platelet-rich fibrin is a second generation platelet concentrate and is defined as an autologous leukocyte and platelet-rich fibrin biomaterial. It was first developed by Choukroun et al [8]. This membrane consists of a fibrin 3-D polymerized matrix in a specific structure, with the incorporation of platelets, leukocytes, growth factors, and the presence of circulating stem cells. A patient reported to the department of periodontics with class II multiple recession wrt to 13-17 .Coronally advanced flap raised along with platelet richfibrin membrane (autologous membrane derived from patient own blood by centrifuging the 10 ml of blood at 3000 rpm for 10 minutes) was placed on surgical site , suturing done and periodontal pack was given and with 2 years follow up 85% of root coverage was achieved.

1.1.2 Case 2

A patient with class II gingival recessions w.r.t 13,14 reported to us. Coronally advanced flap raised then platelet rich plasma along with collagen membrane(Healiguide) placed and flap was coronally advanced and suturing done . Patient was followed up 2 and half years with 95% of root coverage.

1.1.3 Case 3

The amniotic membrane is a composite membrane consisting of a pluripotent cellular element embedded in a semipermeable membranous structure [9]. The human amniotic membrane (HAM) has been used in the field of oral and maxillofacial surgery from 1969 onwards, because of its immunological preference and its pain-reducing, antimicrobial, mechanical, and side-dependent adhesive or anti-adhesive properties [10]. Another case of class I multiple recession wrt 23, 24 has been

reported and coronally advanced flap was raised. The commercially available amniotic membrane (Aminoguard) was cut into the desired shape and length with scissors and placed onto the recession site and suturing was done and patient after follow up of one year and 91% of coverage achieved.

1.1.4 Case 4

In 1985 Raetzke, described a different version of connective tissue graft called "Envelope technique" [11]. Allen in 1994 [7], in a modification of Raetzke's technique, described the "Tunnel or supraperiosteal envelope technique," for treatment of multiple adjacent gingival recession. Santarelli et al. [8] adapted the tunnel technique using a single vertical incision.

Class II multiple recession w.r.t 13,14 has been reported and pouch and tunnel technique was done in which a pouch is created along with the gingival margins in recession area these pouches has been connected by making tunnel with the help of periosteum elevator . In this technique sulcular incisions through each recession area were given with a number 15 blade. Care was taken not to extend the incisions till the tip of the interdental papilla. A full thickness mucoperiosteal flap was reflected, extending beyond the mucogingival junction. This was done so as to reduce the tension on the flap to facilitate coronal displacement following placement of the graft. Each pedicle adjacent to the recession was undermined gently, without detaching it completely to prepare a tunnel. The undermining of tissues to prepare the tunnel was done by extending it laterally about 3-5 mm and then PRF membrane is placed in pouch and suturing was done by advancing the suture more coronally and to avoid displacement of sutures composite was placed on the sutures on the incisal ends of the teeth and patient was followed up for 2 years and 4 months and 97% of coverage was achieved.

1.1.5 Case 5

The current case introduce a novel, minimally invasive approach applicable for both isolated recession defects as well as multiple contiguous defects in the maxillary anterior region. Access to the surgical site is obtained by means of an approach referred to as vestibular incision subperiosteal tunnel access (VISTA).

A case of class II multiple recession in the maxillary anterior region from 13-23 was reported. The VISTA approach began with a vestibular access incision in the midline of the maxillary frenum , which provided access to the entire anterior maxilla. Subperiosteal tunnel was created by passing the incision through the periosteum and inserting a periosteal elevator between the periosteum and bone through the vestibular access incision. To mobilize gingival margins and facilitate coronal repositioning, the tunnel was extended at least one or two teeth beyond the teeth requiring root coverage. In order to achieve a low-tension coronal repositioning of the gingiva, the tunnel was sufficiently elevated beyond the mucogingival junction as well as through the gingival sulci of the teeth being augmented. Subperiosteal tunnel extension was carried out interproximally also below each papilla without making any surface incisions. Freshly prepared platelet-rich fibrin (PRF) membrane was then trimmed to fit the dimensions of the recipient site and the width was adjusted to extend at least 3-4 mm beyond the bony dehiscence's overlying the root surfaces. The PRF membrane was then carefully inserted into the subperiosteal tunnel and repositioned below the gingival margin of each tooth. The membrane and mucogingival complex were then advanced coronally and stabilized in the new position with a coronally anchored suturing technique. Direct interrupted sutures at approximately 2-3 mm apical to the gingival margin of each tooth were placed using 3-0 silk suture. Sutures were tied, and the knots positioned at the mid coronal point of each tooth and stabilized at that position by placing composite stops. Periodontal dressing was placed to cover the surgical site. Patient was put on strict maintenance regime and after 2 years follow up it was notice that 96% root coverage was achieved.

1.1.6 Case 6

1.1.6.1 Free gingival graft

A 25-year-old female patient complained of hypersensitivity in the lower anterior teeth region since 2 months and was concerned about the esthetics. Patient had gingival recession on the mandibular right and left central incisor .e 31, 41 at the first examination The clinical attachment loss was 5mm from the CEJ. The incisors represent the class II recession. Recipient site was prepared by giving vertical and horizontal incision at 90 degree angle and then free

mucosal graft was harvested from the palatal region trimmed to a thickness of 2 to 3mm. Within minutes of removal, the donor tissue was placed at the recipient site. Vertical stabilizing sutures (4-0 resorbable sutures -vicryl) were used to

secure the graft. Postoperative healing after 6 months reveal excellent healing of the site and complete coverage of recession was achieved than patient was followed up for 2 years and 94% of root coverage was achieved.

Pictures of free gingival grafts

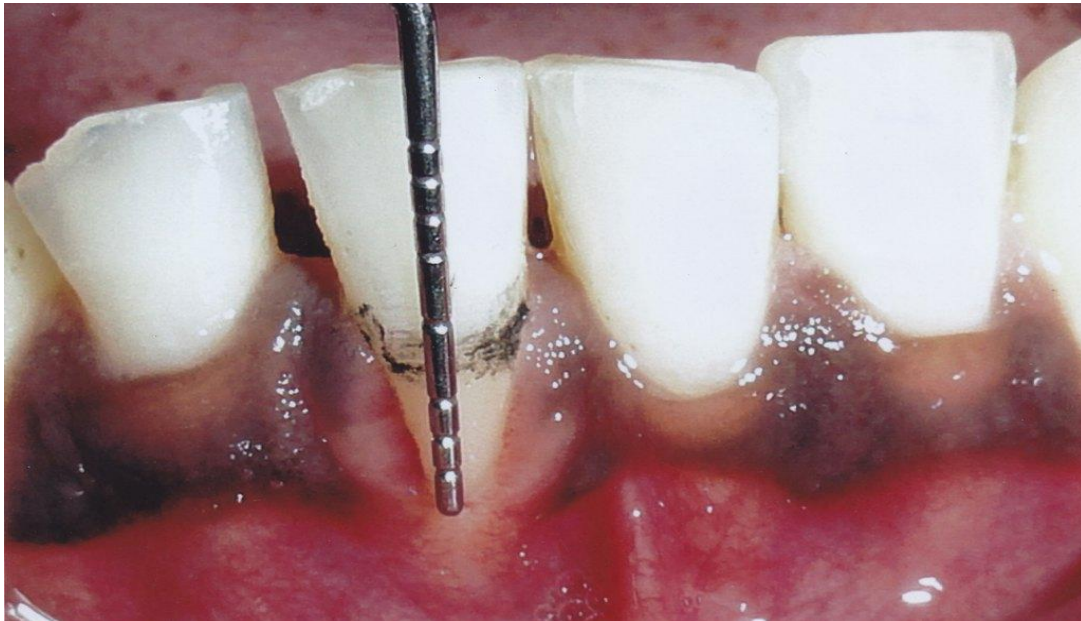


Fig. 1. Pre operative



Fig. 2. Incision given



Fig. 3. Recipient site

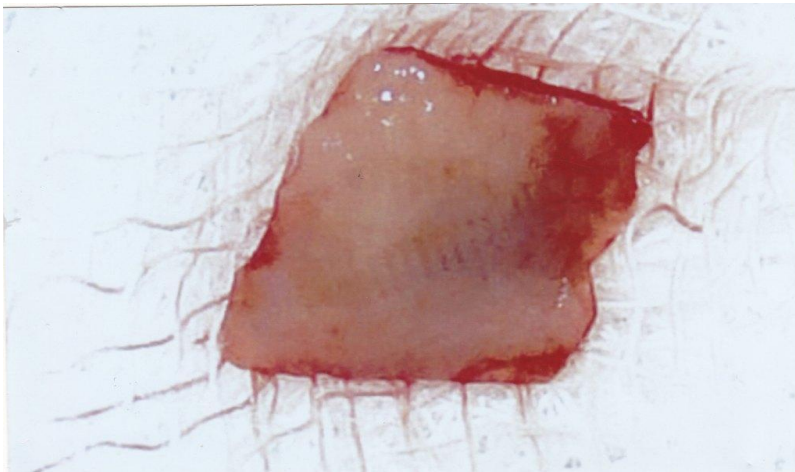


Fig. 4. Free gingival graft harvested from palate

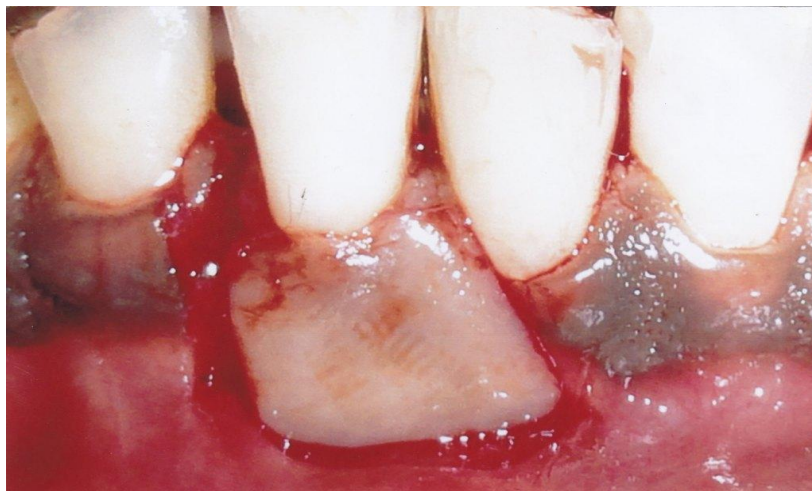


Fig. 5. Graft placed on recipient site

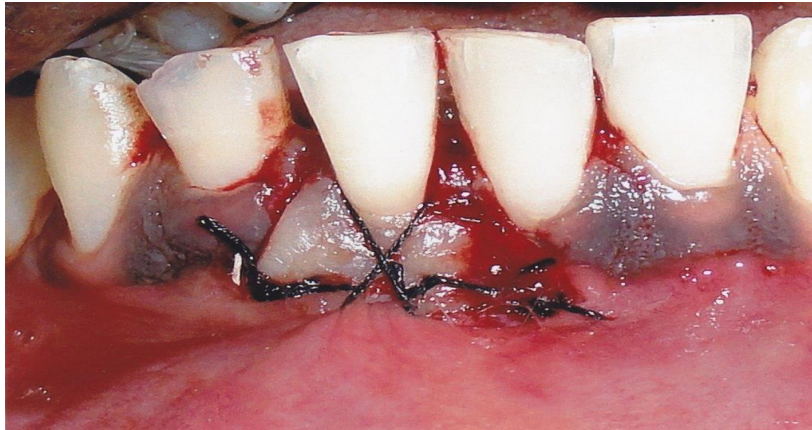


Fig. 6. Suture placed



Fig. 7. Post operative followup of 2 years

Multiple recession covering with amniotic membrane



Fig. 8. Pre operative view & Incision Given

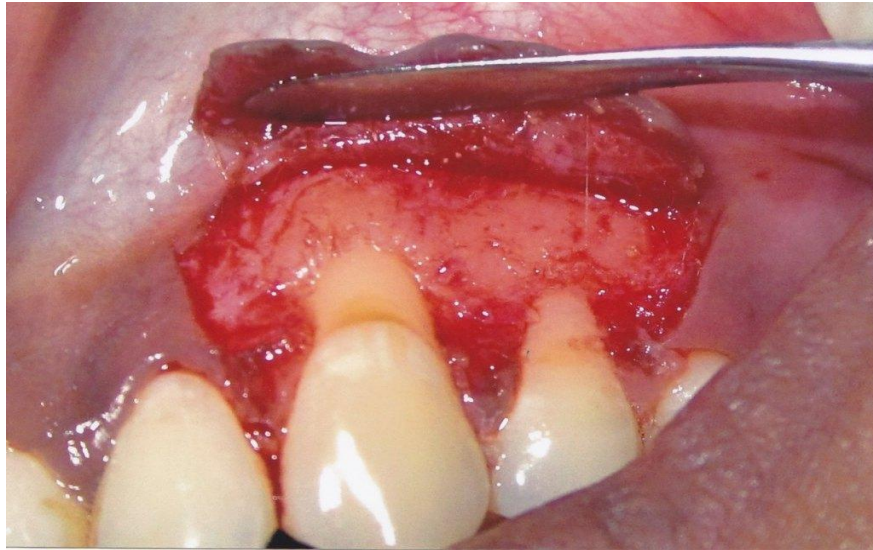


Fig. 9. Split thickness flap raised



Fig. 10. Amniotic membrane

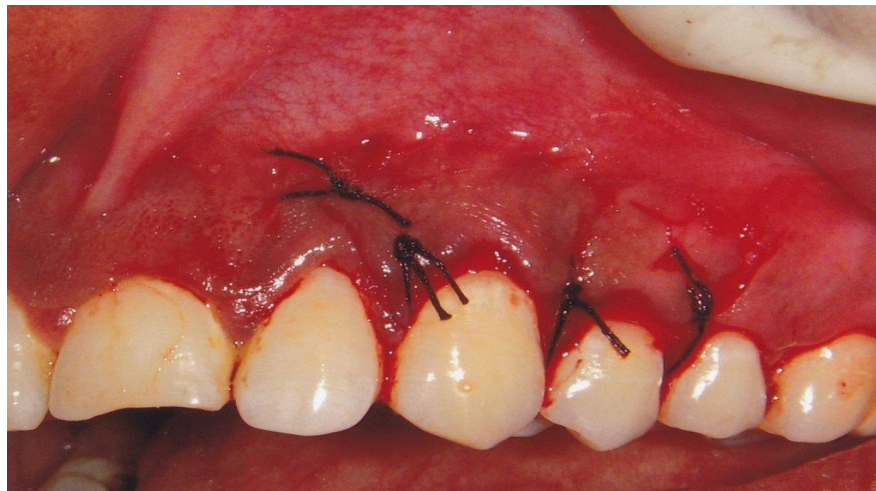


Fig. 11. Suture placed



Fig. 12. Post operative

Multiple recession covering with PRP and GTR



Fig. 13. Pre operative view



Fig. 14. Incision given

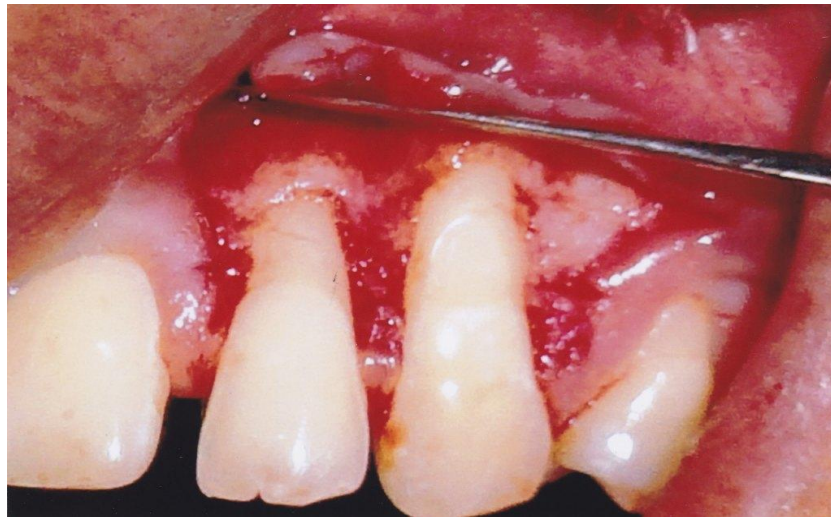


Fig. 15. Split thickness flap raised



Fig. 16. Root biomodification with doxycyclin

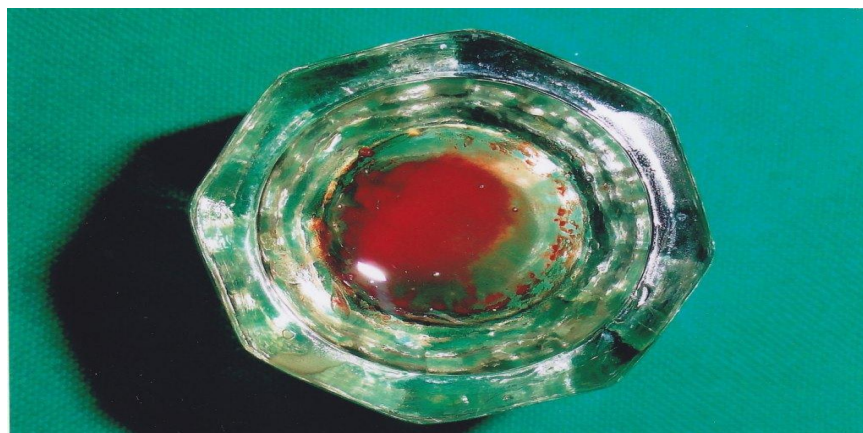


Fig. 17. PRP - Platelete rich plasma

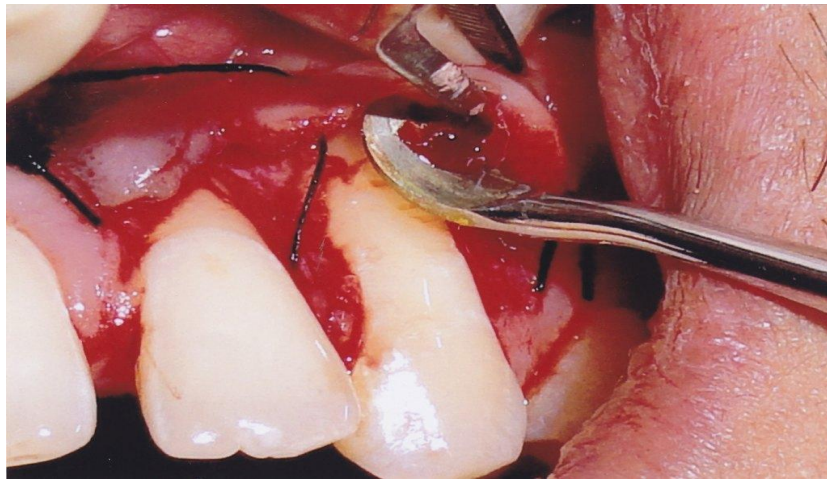


Fig. 18. PRP placed w.r.t recession



Fig. 19. GTR membrane placed

Multiple recession covering with PRF - platelete rich fibrin



Fig. 20. Pre operative view



Fig. 21. Incision given

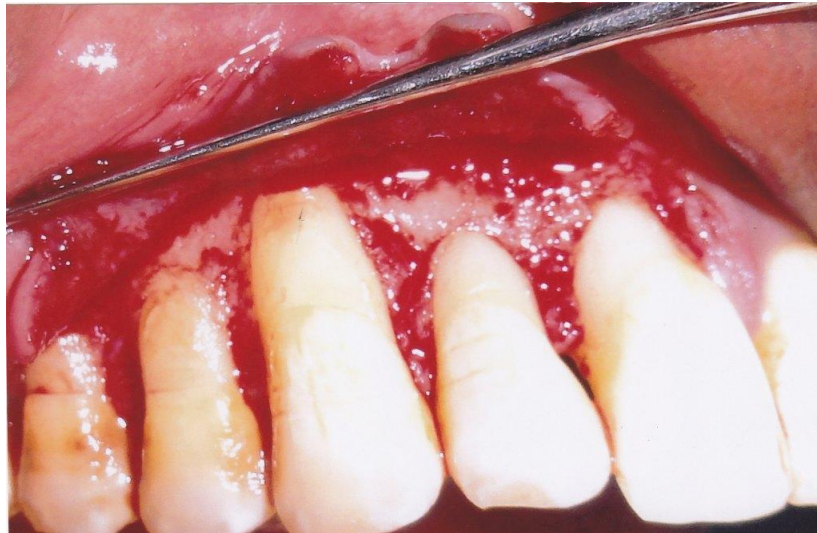


Fig. 22. Full thickness flap raised

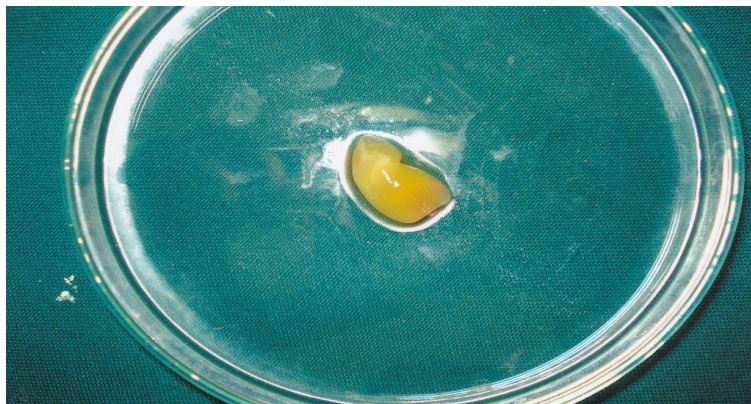


Fig. 23. PRF - platelete rich fibrin

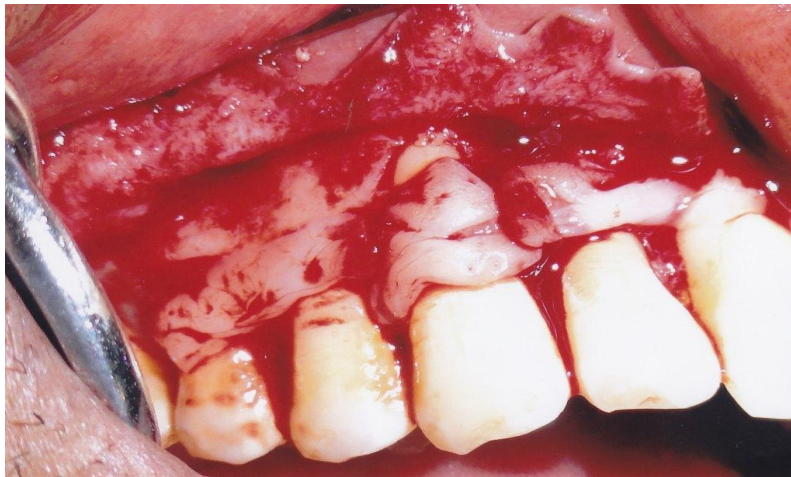


Fig. 24. Platelete rich fibrin placed



Fig. 25. Suture placed



Fig. 26. Post operative view - after 1 yr

Multiple recession covering with pouch and tunnel technique

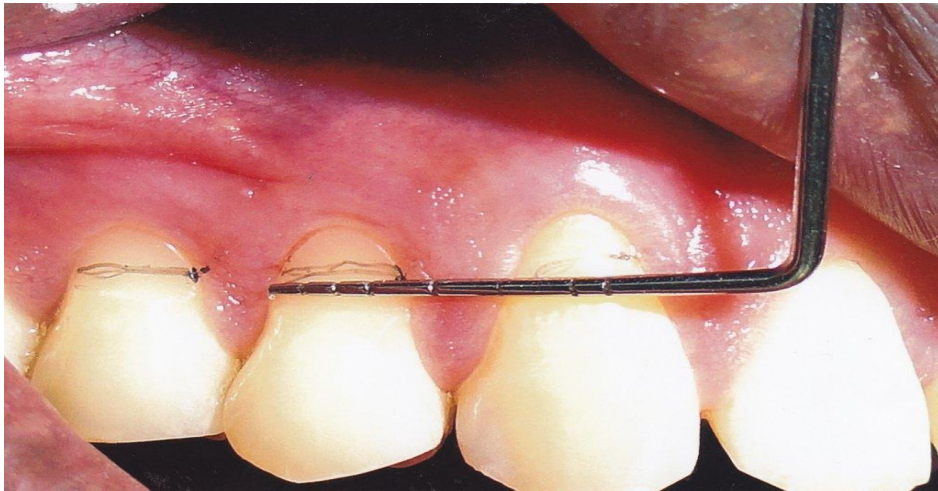


Fig. 27. Pre operative view



Fig. 28. Incision given

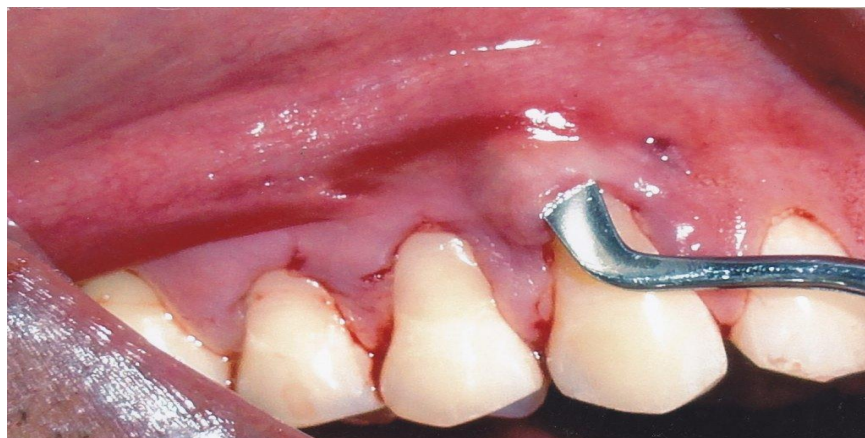


Fig. 29. Pouch and tunnel created

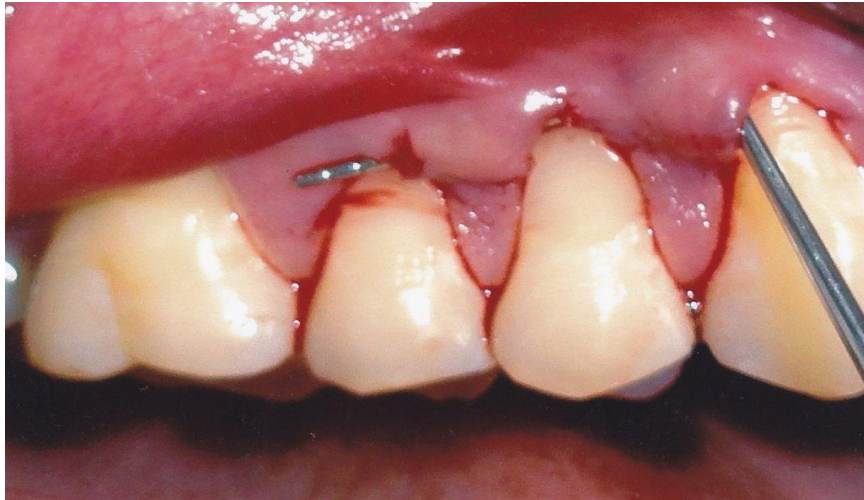
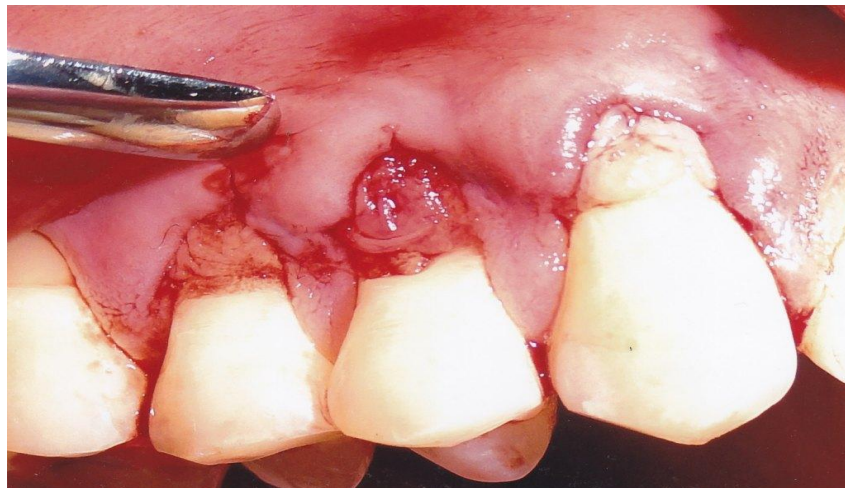


Fig. 30. PRF membrane placed



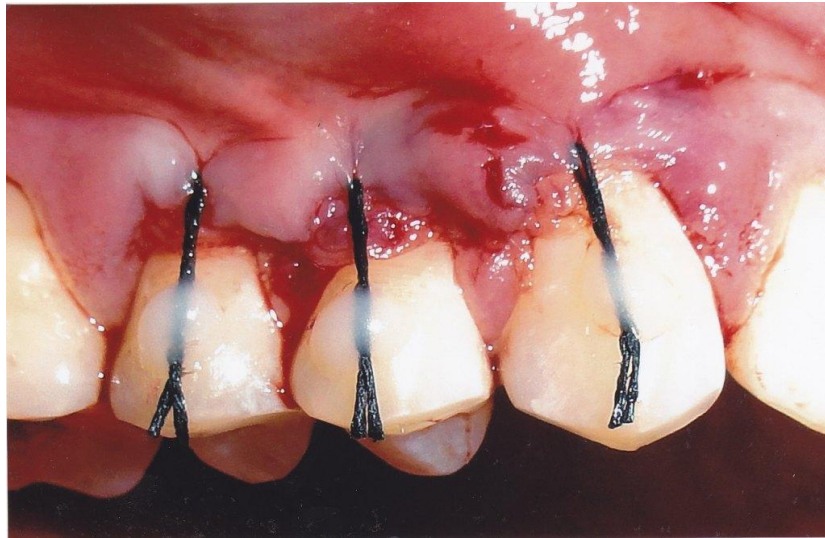


Fig. 31. Suture placed with composite Buttons



Fig. 32. Post operative view after 2 years

Multiple recession covering with vista technique



Fig. 33. Pre operative view



Fig. 34. Incision given

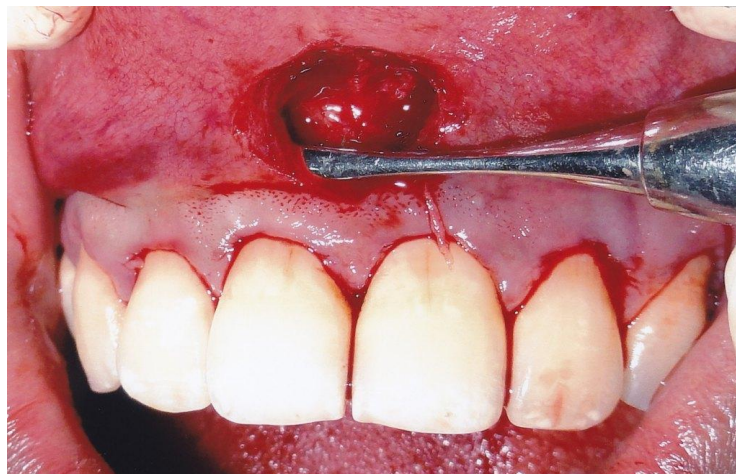


Fig. 35. Sub periosteal tunnel created



Fig. 36. PRF membrane placed

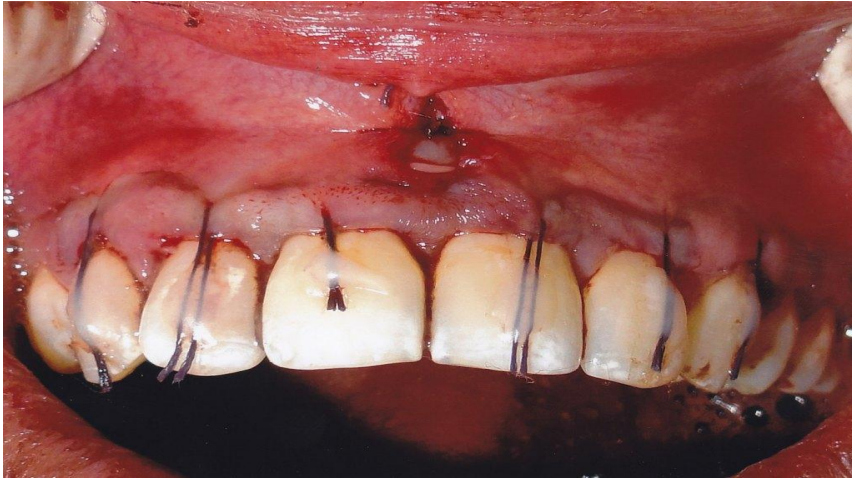


Fig. 37. Suture Placed with composite buttons



Fig. 38. Post operative view with 1.5 year followup

2. DISCUSSION

Gingival recession treatment can no longer be considered as a single treatment approach. In fact, there is evidence to consider mucogingival plastic surgery as a multifactorial treatment approach comprising careful selection of patients and defects, different surgical techniques, many suturing approaches, and various types of adjunctive materials. All the cited components should be variously combined to develop different treatment strategies with different degrees of technical difficulties. In multiple adjacent recession type defects (MARTD) the avascular surface is more extensive.

Furthermore some anatomical characteristics such as thin biotype, decreased keratinized tissue (KT) width, root prominence and root proximity make much more difficult the choice of surgical treatment compared to localized gingival recession type defects.

The predictability of treatments aimed to provide root coverage in cases of localized gingival recessions (LGR) has been reviewed extensively in several systematic reviews (Roccuzzo et al. 2002, Cheng et al. 2007, Oates et al. 2003) of Miller's Class I and II recession type defects (Miller 1983). However scientific literature is sparse regarding the treatment of MARTD and randomized control trials (RCTs) are needed to identify the indication for each surgical technique and any prognostic factors (Chambrone et al. 2009).

Both localized and multiple gingival recessions may be a concern for patients for a number of reasons. In addition to root hypersensitivity, erosion and root caries, aesthetic considerations may also come into play (Wennström 1996), particularly in those patients who have a high lip smile line.

Recently, new techniques have been suggested for the surgical treatment of multiple adjacent recession type defects (MARTD). These are mainly derived from the coronally advanced flap (CAF) [3], a supraperiosteal envelope technique (SET) in combination with a subepithelial connective tissue graft (CTG) [7], or its evolution as a tunnel technique (Azzi & Etienne 1998, Zabalegui et al. 1999, Tozum & Dini 2003)8. The main goal of these plastic periodontal surgery procedures is to obtain root coverage and optimal aesthetic appearance with complete root coverage and blending of the mucosa and/or gingiva.

So as increase the efficacy of the root coverage treatment, reduce the morbidity of the technique and improve clinical outcomes, proposals have been made for the addition of biological factors such as; enamel matrix derivative (EMD) (Ito et al. 2000, Pilloni et al. 2006); Amniotic membrane [9]; platelet rich fibrin (PRF) (Aroca et al. 2009).

The autologous Platelet Rich Fibrin clot (PRF) was used initially in implant surgery in order to improve bone healing (Choukroun et al. 2000). In spite of a lack of scientifically proven clinical benefit, the homogeneous fibrin network that is obtained is considered by the promoters of the technique to be a healing biomaterial and is commonly utilized in implant and plastic periodontal surgery procedures (Choukroun et al. 2006) to enhance bone regeneration and soft tissue wound healing. Compared to PRP, there are few references in the literature to the biological properties of PRF. However, it contains platelets, growth factors and cytokines that may enhance the healing potential, not only of bone, but also of soft tissues (Soffer et al. 2003). PRP and PRF differ in their preparation protocols. PRF is used without any addition of anticoagulant and is centrifugated once.[10,11]

Multiple adjacent recession type defects (MARTD) present a further challenge since:

- in order to minimize patient discomfort and to improve clinical outcomes , several recessions must be treated in a single surgical session.
- the management of Class III recession defects, combined with interproximal bone loss and cervical recession presents a complex challenge to the periodontist for the regeneration of soft tissues and bone.

MARTD is a good model to evaluate surgical protocols aiming at regeneration with stimulatory wound healing agents, growth factors or tissue engineering. The complexity remains however, since it may be necessary to adapt our surgical techniques to these modulating agents, which have various physical and chemical configurations.

3. CONCLUSION

In conclusion, gingival recessions present challenging soft tissue pathology, with multiple aetiology and a high prevalence which increases with age. Its successful surgical management is closely related to the identification and the elimination of its etiologic factors, the careful selection of the surgical technique and its correct

implementation because the procedure is very technique-sensitive. A wide range of surgical techniques has been proposed for the treatment of the gingival recessions, each with its advantages and disadvantages. To provide predictable and long-term results, it is of paramount importance that the surgical technique is individually selected, taking into account several crucial factors such as the size of the defect, the width of the keratinised gingiva apical to the defect and the thickness of the flap. So far, the combination of the subgingival connective tissue graft with the coronally advanced flap represents the gold standard in the treatment of the gingival recessions. More recent techniques such as the combination of CAF with enamel matrix derivative, or with platelet-rich fibrin or with xenogeneic collagen membrane, need further evaluation through more extensive studies.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/65150>