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Periodontal Plastic Surgery For Treatment of Gingival Recession: A literature review

A Project Submitted to

The College of Dentistry, University of Baghdad, Department of Periodontics in Partial Fulfilment for the Bachelor of Dental Surgery

By

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Certification of the Supervisor

I certify that this project entitled "Periodontal plastic surgery for treatment of gingival recession" was prepared by the fifth-year student under my supervision at the College of Dentistry/University of Baghdad in partial fulfilment of the graduation requirements for the Bachelor Degree in Dentistry.

Supervisor name:

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Dedication

I dedicate this project to God Almighty our creator, our strong pillar, our source of inspiration, wisdom, knowledge and understanding. He has been the source of our strength and on His wings only we have soared and with all the love and respect, I dedicate this project to my lovely mother, father, brothers and our friends for their great support and for always believing in us to our all friends and colleagues finally to our supervisor who encourages us to keep go

Acknowledgment

First of all, we would like to thank almighty Allah for inspiring us the energy, patience and strength to accomplish this work.

Many thanks to my supervisor my professor Dr.Saif Sehaam for continuously supporting the writing of this project.

Special Thanks for my family and friends for their care, love and support Great appreciation to everyone who helped in the completion of this scientific research review.

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Introduction

Mucogingival therapy is a general term used to describe periodontal treatment involving procedures for correction of defects in morphology, position, and/or amount of soft tissue and underlying bone support at teeth and implants **(Glossary of Terms in Periodontology, 2001).**

A more specific term, mucogingival surgery was introduced in **(1950) by Friedman** and was defined as surgical procedures designed to preserve gingiva, remove aberrant frenulum or muscle attachments, and increase the depth of the vestibule. Frequently, however, the term "mucogingival surgery" was used to describe all surgical procedures that involved both the gingiva and the alveolar mucosa. Consequently, not only were techniques designed to enhance the width of the gingiva and to correct particular soft tissue defects regarded as mucogingival procedures but certain pocket elimination approaches were also included in this group of periodontal treatment modalities.

In **(1993), Miller** proposed the term periodontal plastic surgery, considering that mucogingival surgery had moved beyond the traditional treatment of problems associated with the amount of gingiva and recession type defects to also include correction of ridge form and soft tissue esthetics. Periodontal plastic surgery would accordingly be defined as "surgical procedures performed to prevent or correct anatomic, developmental, traumatic or disease-induced defects of the gingiva, alveolar mucosa or bone. **(Proceedings of the World Workshop in Periodontics, 1996)**

Among the many treatment procedures available this literature review will cover Gingival augmentation and Root coverage.

Aim of the study

To understand the definition, etiology and classification system of gingival recession and the available treatment options for patients.

Chapter one: Review of literature

1.1 Gingival recession

1.1.1 Definition

Gingival recession can be defined as the exposure of the root surface due to an apical shift in the position of the gingiva. Normally, the gingival margin is positioned 1 to 3 mm coronal to the tooth's cementoenamel junction circumferentially, such that the coronal portion of the root is totally covered with gingival tissue **(Carranza 1997).**

Exposed roots may cause hypersensitivity or esthetic concerns for the patient **(Gorman WJ, 1967)**. and can be covered by a variety of mucogingival surgical procedures described in this chapter.

1.1.3 Causes:

Localized gingival recession may be caused by traumatic tooth-cleaning techniques, especially when teeth are prominent in the dental arch and the overlying soft tissue is thin **(O'leary T; Drake R, 1972)**. Localized gingival recessions such as gingival clefts have been attributed primarily to local irritants such as plaque and calculus, possibly influenced by excessive occlusal forces, severe orthodontic tipping of teeth, provisional crowns, periodontal surgery, mechanical traumatic factors such as fingernail-biting habits, and the extraction of adjacent teeth **(Lammie G; Posselt V, 1965)**.

In general, the causal factors implicated in gingival recession include oral hygiene habits, high muscle attachments and frenal pull, tooth malpositioning, bone dehiscences, and iatrogenic factors related to various restorative and periodontal procedures **(Thomas G et al, 2003)**.

1.1.4 Classifications:

Miller PD (1985) classified gingival recession and predicted the outcome of the corrective surgery based on his classification. Class I defects, where marginal tissue recession does not extend to the mucogingival junction and here is no loss of interproximal periodontium, full coverage of the exposed root can be predicted as a postsurgical outcome. Total root coverage can also be anticipated in the correction of Class II recessions, which differ from Class I recessions only in that they extend to or beyond the mucogingival junction with interproximal tissues intact. Partial root coverage can be expected in Class III recessions where modest interproximal tissue loss decreases the chance for new attachment gain on the midradicular aspect. Due to the pronounced Severity of interdental bone and gingival tissue loss and/or tooth malpositioning in the Class IV situation, full root coverage cannot be expected (Figure 1). Miller's classification does not consider all the cases of recession. For example, a marginal tissue recession with inter□proximal bone loss that does not extend to the mucogingival junction is not classified. In fact, this recession cannot be included in class I because of inter□proximal bone loss and it cannot be categorized in class III because the gingival margin does not extend to the mucogingival junction. In addition, palatal recessions are not mentioned in this classification system. This is because of the lack of the mucogingival junction on the palatal side, it is impossible to classify these lesions.

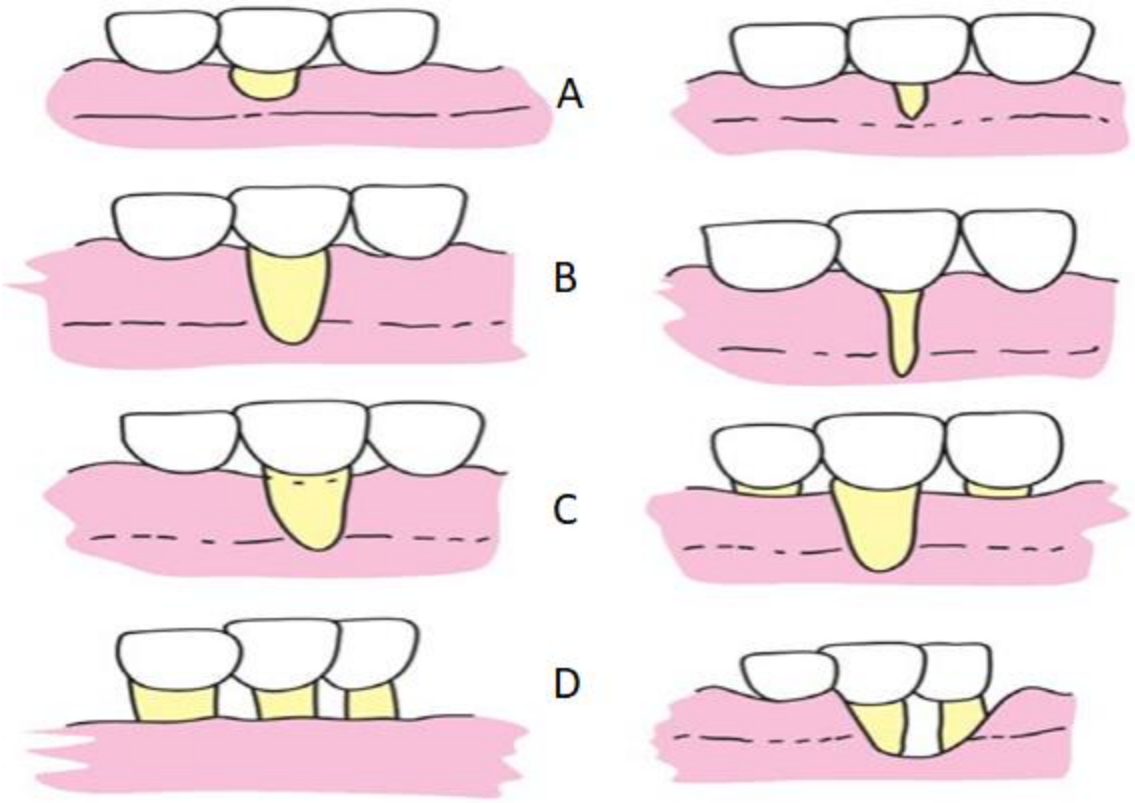

Figure (1) **A.** Class I Miller defect **B.** Class II Miller defect **C.** Class III Miller defect **D.** Class IV Miller defect **(Miller PD, 1985)**

Cairo et al. (2011) classified gingival recession based on the assessment of CAL at both buccal and interproximal sites.

• Recession Type 1: Gingival recession with no loss of interproximal attachment. Interproximal CEJ was clinically not detectable at both mesial and distal aspects of the tooth

• Recession Type 2: Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the interproximal pocket) was less than or equal to the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket)

• Recession Type 3: Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the pocket) was higher than the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket).

This classification provides a simplified method of categorizing gingival recession and also emphasizes the role of interproximal attachment level. However, it does not consider the remaining width of attached gingiva, relationship of gingival margin, and MGJ, which play a very important role.

1.1.2 Indications for treatment:

Even if a tooth does not exhibit gingival recession at the outset, planned dental therapeutic procedures such as orthodontics, which may cause tooth roots to be more prominent in the dental arch, or the invasive placement of subgingival prosthetic crown margins into areas previously occupied by attached connective tissue fibers or areas of minimal attached keratinized gingiva can promote gingival recession, requiring subsequent surgical correction **(Stetler K; Bissada N, 1987).**

The mere presence of gingival recession may not substantiate treatment in the absence of tooth sensitivity, objectionable visibility in the cosmetic zone, or progressive recession. Patients may be unconcerned about the appearance of clinical crowns lengthened by gingival recession, or they may have long upper lips that cover the gingiva, even during a broad smile. If a patient is concerned about the cosmetic effect of "receding gums," correction is appropriate. Teeth that are scheduled for fixed partial dentures may not require surgical techniques for root coverage where the prosthesis will cover the sensitive or unesthetic exposed root. Therefore, where indicated, a complete restorative treatment schedule should be mapped out prior to planning corrective surgical procedures **(Thomas G et al, 2003)**.

1.2 Augmentation of Attached gingiva

Attached gingiva refers to the gingival tissue that is firmly bound to the underlying tooth and bone. this is differentiated from keratinized gingiva, which includes both the attached gingiva and the free gingival margin. It was originally believed that a minimum width of attached gingiva was required to maintain optimal gingival health and prevent recession, However, several longitudinal studies have demonstrated that neither the lack of nor the presence of minimal amounts of attached gingiva necessarily results in the progression of soft tissue recession. Therefore, the concept of adequate attached gingiva is subjective and describes that amount of tissue that is conducive to gingival health in the clinician's opinion. However, there are factors to help guide the clinician in determining whether a particular site will require a mucogingival procedure to augment the width of attached gingiva **(Proceedings of the World Workshop in Periodontics, 1996)**.

1.2.1 Indications for Increasing the Width of Attached Gingiva:

gingival augmentation should be considered in situations where the patient experiences discomfort during toothbrushing and/or chewing due to an interfering lining mucosa. Furthermore, when orthodontic tooth movement is planned and the final positioning of the tooth can be expected to result in an alveolar bone dehiscence, an increase of the thickness of the covering soft tissue may reduce the risk for development of soft tissue recession. An increase of the thickness of the gingival margin may in certain situations also be considered when subgingival restorations are placed in areas with a thin marginal tissue. **(Jan lindhe et al, 2003)**

1.2.2 Surgical augmentation:

Various techniques have been developed for the augmentation of attached gingiva to prevent further gingival recession. Gingival augmentation operations comprise a number of surgical techniques, the majority of which have been

developed mainly on an empiric basis and without sufficient knowledge about the biology of the involved tissues. The earliest of these techniques are the **"vestibular extension operations"**. Those were specifically designed to extend the depth of the vestibular sulcus. s **(Bohannan, 1962)**

In 1963, the autogenous free gingival graft was introduced and have become the most commonly used techniques in the management of "insufficient" gingival dimensions, because of higher predictability of the healing result. **(Bjorn H, 1963)**

1.2.3 Vestibular/gingival extension procedures:

The denudation technique involved the removal of all soft tissue starting from the gingival margin and extending to an area apical to the mucogingival junction leaving the alveolar bone completely exposed. Healing following this type of treatment resulted often in an increased height of the gingival zone. However, the exposure of alveolar bone produced severe bone resorption with permanent loss of bone height **(Wilderman et al. 1961)**

Carranza & Carraro, (1963); Carraro et al. (1964) also concluded that the recession of marginal gingiva in the surgical area often exceeded the gain of gingiva obtained in the apical portion of the wound. Due to these complications and severe postoperative pain for the patient, the use of the "denudation technique" can hardly be justified.

Periosteal retention procedure or "split flap" procedure is another technique where only the superficial portion of the oral mucosa within the wound area was removed leaving the bone covered by periosteum. **(Staffi leno et al. 1962, 1966; Wilderman 1963; Pfeifer 1965)**

Although the preservation of the periosteum implies that less severe bone resorption will occur than following the denudation technique, loss of crestal bone height was also observed following this type of operation unless a relatively thick layer of connective tissue was retained on the bone surface If a thick layer was not

secured, the periosteal connective tissue tended to undergo necrosis and the subsequent healing closely resembled that following the denudation technique described above **(Costich & Ramfjord 1968)**.

The vestibular/gingival extension operation was based on the assumption that the amount of keratinized tissue adjacent to the teeth was dependant on the frictional forces produced during mastication **(Orban 1957; Pfeifer 1963)**. Therefore, it was believed that by the displacement of muscle attachments and the extension of vestibular depth, the regenerating tissue in the surgical area would be subjected to physical impacts and adapt to the same functional requirements as those met by normal gingiva **(Ivancie 1957; Bradley et al. 1959; Pfeifer 1963)**.
studies, however, showed that the characteristic features of the gingiva are determined by some inherent factors in the tissue rather than being the result of functional adaptation and that the differentiation (keratinization) of the gingival epithelium is controlled by morphogenetic stimuli from the underlying connective tissue **(Jan Lindhe; Niklaus P. Lang. 1994).**

1.2.4 Grafting procedures

The gingival and palatal soft tissues will maintain their original characteristics after transplantation to areas of the alveolar mucosa **(Jan Lindhe; Niklaus P. Lang. 1994)**. Hence, the use of transplants offers the potential to predict the post-surgical result. The type of transplants used can be divided into (1) pedicle grafts, which maintain their connection with the donor site after placement at the recipient site, and (2) free grafts that are completely separated from the donor area. For gingival augmentation free grafts have been used most commonly **(Haggerty, 1966; Nabers, 1966).**

Technique for free gingival graft

Preparing the Recipient Site

After adequate anesthesia has been achieved, the recipient site is prepared with a trapezoidal-shaped split-thickness flap, which is reflected to expose a firm connective tissue bed to receive the graft. To accomplish this, a No. 15 Bard-Parker scalpel is positioned perpendicular to the tissue, and a horizontal incision is made at the mucogingival junction, preserving the gingival margin. The incision should extend from the mesial line angle of the two teeth adjacent to the site to be augmented. Two vertical incisions extending to the alveolar mucosa are made, again positioning the blade perpendicular to the tissue. This creates an outline of the recipient site, which is trapezoidal and has butt-joint margins. After the outline is complete, the No. 15 blade is positioned parallel to the alveolar bone, and a split-thickness flap consisting of epithelium and connective tissue is elevated without disturbing the periosteum. The flap will extend apically to the depth of the vertical incisions (Figure 2.A). All movable tissues are removed with the tissue scissors so that only an immovable layer of connective tissue remains. If the remaining connective tissue is still mobile, it should be removed, and the graft can be placed directly on bone. Finally, the elevated flap tissue is removed with the scissors or nippers. Sterile moistened gauze with pressure is used for hemostasis at the site. A tinfoil template of the recipient bed is fabricated to be used as a pattern for the graft (Figure 2.B). **(Thomas G et al, 2003)**

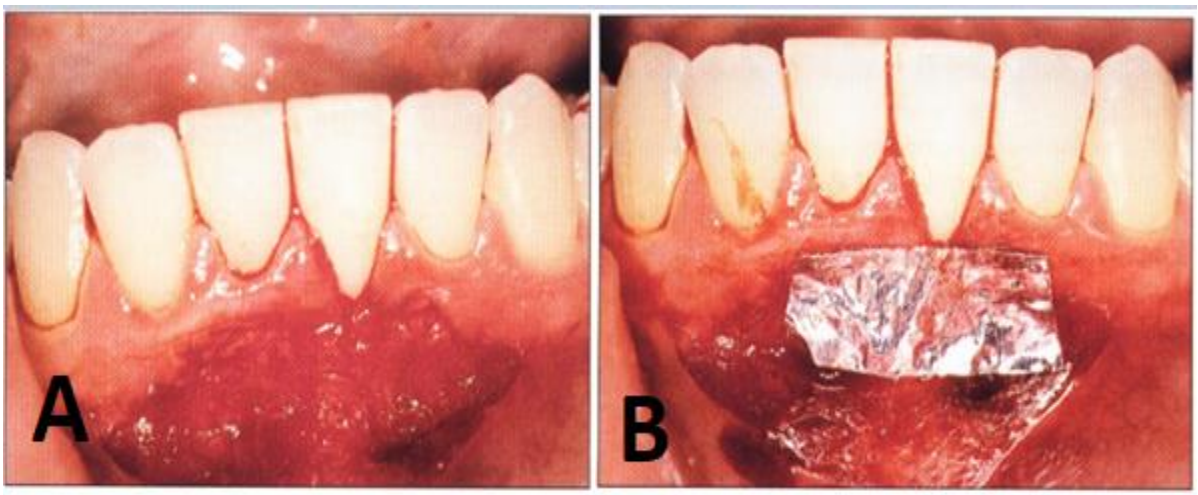

Figure (2) **A.** after removal of split thickess flap, the site consists of firm connective tissue and is ready to receive the graft **B.** tinfoil template used to assess graft dimensions **(Richard J, 2004).**

Harvesting the Donor Tissues

The donor tissue is harvested from the palatal mucosa and should consist of epithelium and a thin layer of connective tissue. To obtain the donor tissue, the tinfoil template is placed against the palatal tissue in the second premolar-first molar area(Figure 3.A), The palatal rugae is not included in the donor tissue. A shallow incision is made with a No.15 blade using the tinfoil as a template. The template is then removed and the incision is inserted to the desired thickness of 1 to 1.5 mm. The corner of the donor tissue is undermined with the blade and held with the tissue forceps. Using the forceps to create tension, the releasing incision is continued until the donor tissue is completely separated from the host (Figure 3.B). Suction must be used cautiously to avoid loss of the graft. A moistened gauze can be used to minimize bleeding in addition to local anesthesia containing a vasoconstrictor and suturing the wound. Fatty or glandular tissues must be removed as well as any tissue irregularities. Thickness of the graft must be 1 to 1.5 mm **(Friedman N; Levine H.L, 1964).**

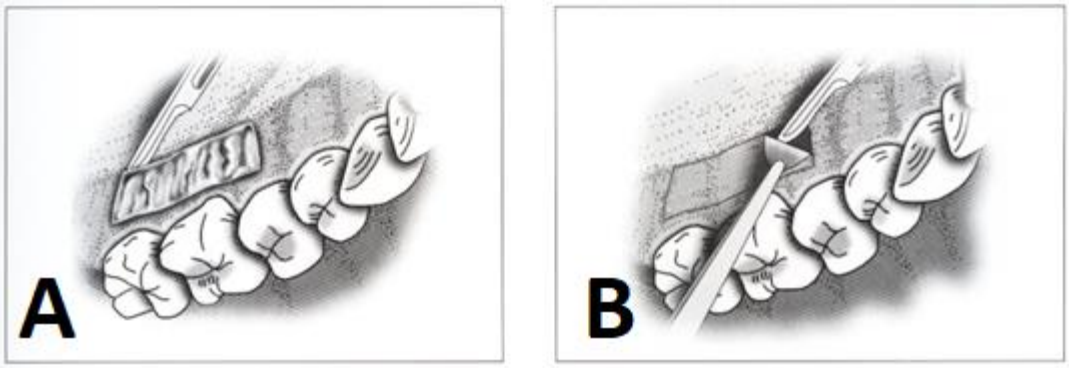

Figure (3) **A.** a template is placed against the palatal tissue and an outline is traced with a No. 15 blade **B.** No. 15 blade is used to undermine and reflect the tissue while the tissue forceps are used to create tension. The graft should be 1 to 1.5 mm in thickness **(Richard J, 2004).**

Stablization of the tissue

The recipient site is first irrigated to remove any excess blood clot. The harvested tissue is positioned with the connective tissue side facing the periosteum. After the harvested tissue have been firmly adapted, the four corners of the flap are sutured with the optional use of a periosteal sling (Figure 2.A). Once the flap is secured, it is covered with periodontal dressing for one week. As the dressing my get displaced and will need to be reapplied, dental floss around the teeth can be used to maintain the dressing in position. The patient is then given analgesics and antibiotics according to the clinician. Palatal stent can be fabricated pre-operatively with cold cure acrylic to minimize post operative discomfort by mechanical trauma. The patient is instructed to wear the stent for continuously for the first 24 hours and then at meals and during sleep for 8-10 days. This procedure has been shown to be a predictable treatment option for teeth with inadequate attached gingiva with orthodontic or restorative needs, or for sites that exhibit progressive gingival recession (Figure 4.B) **(Jan L; Niklaus P. Lang. 1994).**

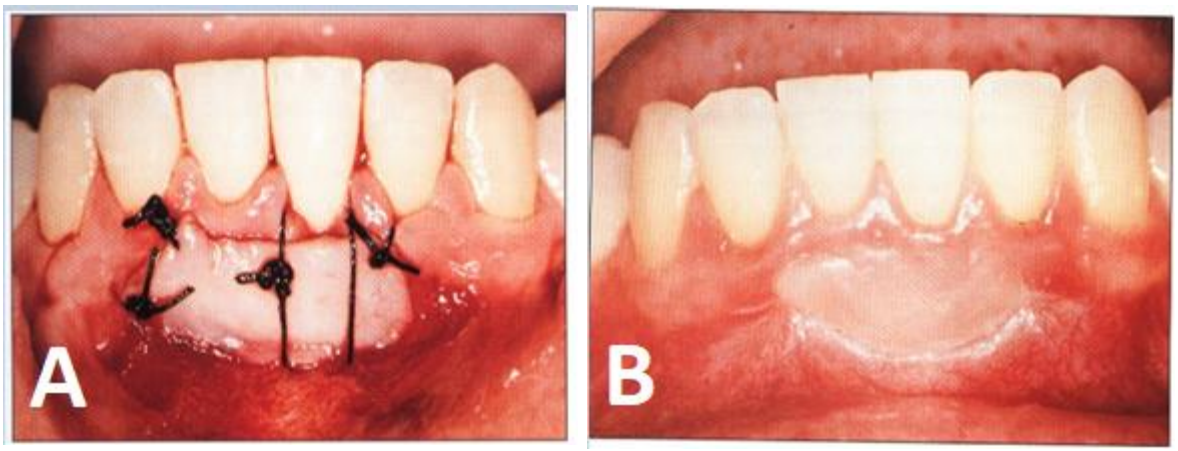

Figure (4) **A.** graft positioned and stabilized with simple interrupted and periosteal sling suture **B.** result after seven months of surgery

1.3 Root coverage Procedure

They are Procedures that aim to cover denuded roots for cosmetic purposes and to decrease root sensitivity. However, total coverage of denuded roots remains a problem for most clinicians because the avascular nature of the root surface hampers the ability of most grafts to survive. The wider is the area of the exposure, the more difficult the problem to treat. The objective of root coverage procedure is to attempt to regenerate any lost tissue **(Langer B; Langer L,1985)**.

It should be recalled that the two major causative factors in the development of marginal tissue recession are trauma caused by toothbrushing and plaque induced periodontal inflammation. The control of these factors will prevent further progression of the recession in most cases. This means that in tooth regions with a thin covering soft tissue, with or without an incipient recession, the patient should be encouraged to carry out effective but at the same time non-traumatic plaque-control measure **(Jan L; Giovan P, 1994).**

1.3.1 Techniques for Root coverage procedures:

According to **Jan L; Giovanni and Giovan P, (1994)** Surgical procedures used in the treatment of recession defects may basically be classified as:

1 -Pedicle soft tissue graft procedures. The pedicle graft procedures are, depending on the direction of transfer, grouped as:

- rotational flap procedures (e.g. laterally sliding flap, double papilla flap)
- advanced flap procedures (e.g. coronally repositioned flap, semilunar coronally repositioned flap).

2- Autogenous free soft tissue graft procedure, The autogenous free soft tissue graft procedure may be performed as:

- an epithelialized graft.
- a subepithelial connective tissue graft (non epithelialized graft), both usually taken from the area of the masticatory mucosa in the palate.

3-Tissue engineering: Scientific advancements in biomaterials, cellular therapies, and growth factors have brought new therapeutic options for periodontal and peri-implant reconstructive procedures. These tissue engineering strategies involve the enrichment of scaffolds with living cells or signaling molecules and aim at mimicking the cascades of wound healing events and the clinical outcomes of conventional autogenous grafts, without the need for donor tissue

Factors, such as depth and width of recession, availability of donor tissue, presence of muscle attachments, and esthetics, have to be taken into consideration in the selection of treatment procedure **(Lorenzo Tavelli, 2022).**

1.3.2 Treatment of the exposed root surface

Before root coverage is attempted the exposed portion of the root should be cleared from bacterial plaque. Preferably, this is achieved by the use of a rubber cup and a polishing paste **(Jan L; Giovan P. 1994).** Controlled clinical trials have shown no differences in terms of root coverage or residual probing depth between teeth that had been instrumented or polished only. Extensive root planing therefore are only performed in situations where a reduced root prominence would be considered beneficial for graft survival or tissue

regeneration, or if a shallow root caries lesion is diagnosed. The presence of a filling in the root does not preclude the possibility for root coverage, but the filling should be removed before the root is covered with soft tissue **(Oles et al. 1988; Pini Prato et al. 1999).**

1.3.3 Pedicle soft tissue graft procedures

Rotational flap procedures

This technique was introduced by **Grupe and Warren (1956),** and was used to cover areas with localized recession. This technique, which was called the laterally sliding flap operation, involves the reflection of a full-thickness flap in a donor area adjacent to the defect and the subsequent lateral displacement of this flap to cover the exposed root surface. In order to reduce the risk for recession on the donor tooth, it is suggested that the marginal soft tissue should not be included in the flap.

Staffileno, 1964 and Pfeifer and Heller (1971) advocated the use of a split-thickness flap to minimize the potential risk for development of dehiscence at the donor tooth.

According to Jan Lindhe et al (2008) The technique is as follows (Figure 5).

Step 1: To prepare the recipient site, A reverse bevel incision is made all along the soft tissue margin of the defect. After removal of the dissected pocket epithelium, the exposed root surface is thoroughly curetted.

Step 2: With a No.15 blade a vertical incision is made extending from marginal gingiva into the mucogingival junction. A crevicular incision is then made from the vertical incision to the defect. A split thickness flap is then raised. It may sometimes be necessary to give a short oblique incision into the alveolar mucosa at the distal corner of the flap, pointing more towards the recipient site. This will enable us to slide the flap laterally without excess tension at the base.

Step 3: After the flap is transferred onto the adjacent root, the flap is sutured to the adjacent gingiva and alveolar mucosa with interrupted sutures. pressure is applied for 2 to 3 minutes to ensure further adaptation. A periodontal dressing is then applied to protect the surgical area for 1 week.

The patient is instructed to avoid mechanical tooth cleaning for further 2 weeks Following removal of the dressing and the sutures, usually after 10–14 days, and to rinse twice daily with a chlorhexidine solution.

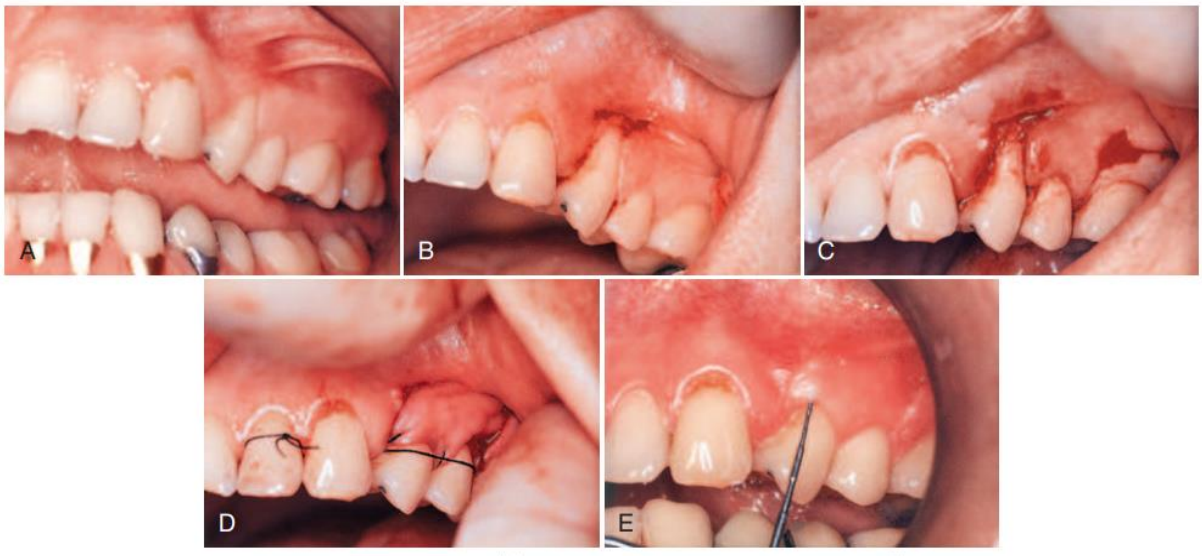

Figure (5) Laterally displaced flap. **A.** Preoperative view of the maxillary bicuspid. **B.** Recipient site is prepared by exposing the connective tissue around the recession. **C.** Incisions are made at the donor site in preparation of moving the tissue laterally. **D.** The pedicle flap is sutured in position. **E.** Postoperative result at 1 year. **(Newman and Carranza, 2018)**

Coronally advanced flap

The purpose of the coronally displaced lap procedure is to create a split-thickness flap in the area apical to the denuded root surface. The flap is coronally positioned to cover the root. Two techniques are available for this purpose. The technique is essentially a coronally positioned pedicle flap. **(Henri H; Robert R, 2018)**

Results with the coronally displaced flap technique are often unfavorable because of insufficient keratinized gingiva apical to the recession. To overcome this problem, a variations of the First Technique gingival augmentation procedure with a free autogenous graft can be performed before the coronally positioned graft as described earlier. This creates several millimeters of attached keratinized gingiva apical to the denuded root surface. Two months after this surgery, a second-stage procedure is performed to coronally position the lap, which includes the free autogenous graft (Figure 6). **(Hall WB, 1984)**

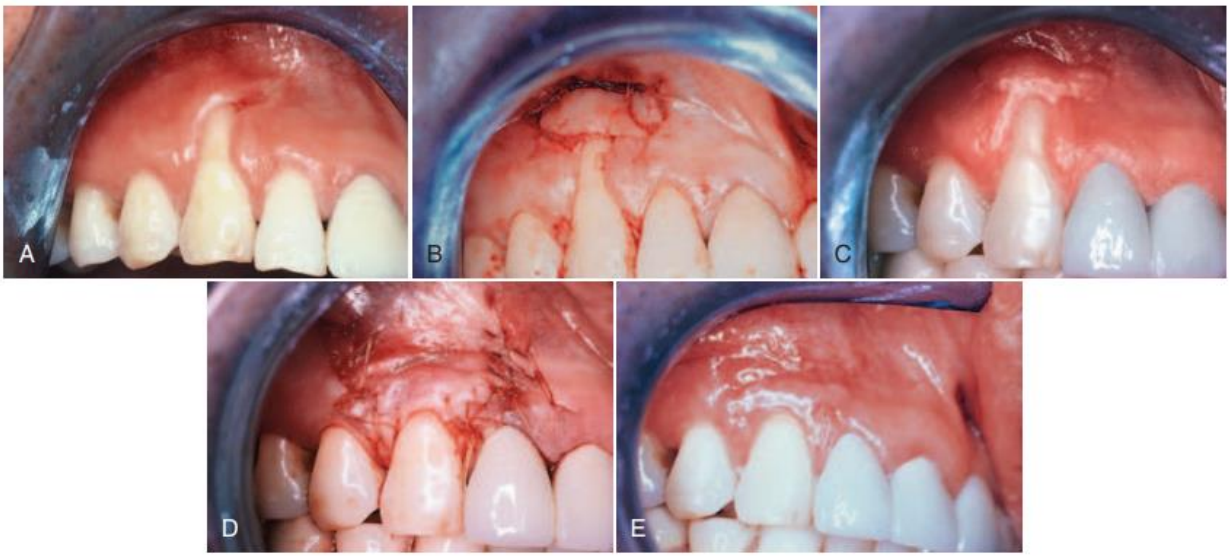

Figure (6) Coronally displaced flap. **A.** Preoperative view, showing the recession and the lack of attached gingiva. **B.** After placement of a free gingival graft. **C.** Three months after placement of the graft. **D.** Flap, including the graft, positioned coronally and sutured. **E.** Six months later, showing the root coverage and attached gingiva. **(Newman and Carranza, 2018)**

1.3.4 Subepithelial connective tissue graft

The technique (i.e., Langer procedure) utilizing a subepithelial soft tissue graft, i.e. the connective tissue, involve the placement of the graft directly over the exposed root and the mobilization of a mucosal flap coronally or laterally for coverage of the graft. The subepithelial connective tissue graft is harvested from the palate or the retromolar pad by the use of a trap door approach. The connective tissue graft is preferable to the epithelialized graft due to a less invasive

palatal wound and an improved esthetic result. **(Langer & Langer, 1985; Nelson, 1987)**

Technique (Figure 7) according to **Langer B, Langer L (1985):**

The surgical technique utilized is the coronally advanced flap as described above, but with the difference that the flap is elevated entirely as a split-thickness flap. The interdental papillae should be de-epithelialized to allow for maximum coronal positioning of the tissue flap over the exposed root surface at suturing. subepithelial connective tissue graft of masticatory mucosa is harvested on the palatal aspect of the maxillary premolar/first molar or from the retromolar pad by the trap door approach. Then, A horizontal incision, is made approximately 3 mm apical to the soft tissue margin. An incision is then placed from the line of the first incision and directed apically to perform a split incision of the palatal mucosa. A small periosteal elevator or scalpel is used to release the connective tissue graft from the bone. tissue graft from the bone. The graft is transferred to the recipient site and positioned at a distance from the CEJ equal to the height of keratinized tissue originally present apical to the recession defect. The graft is then sutured and secured in position.

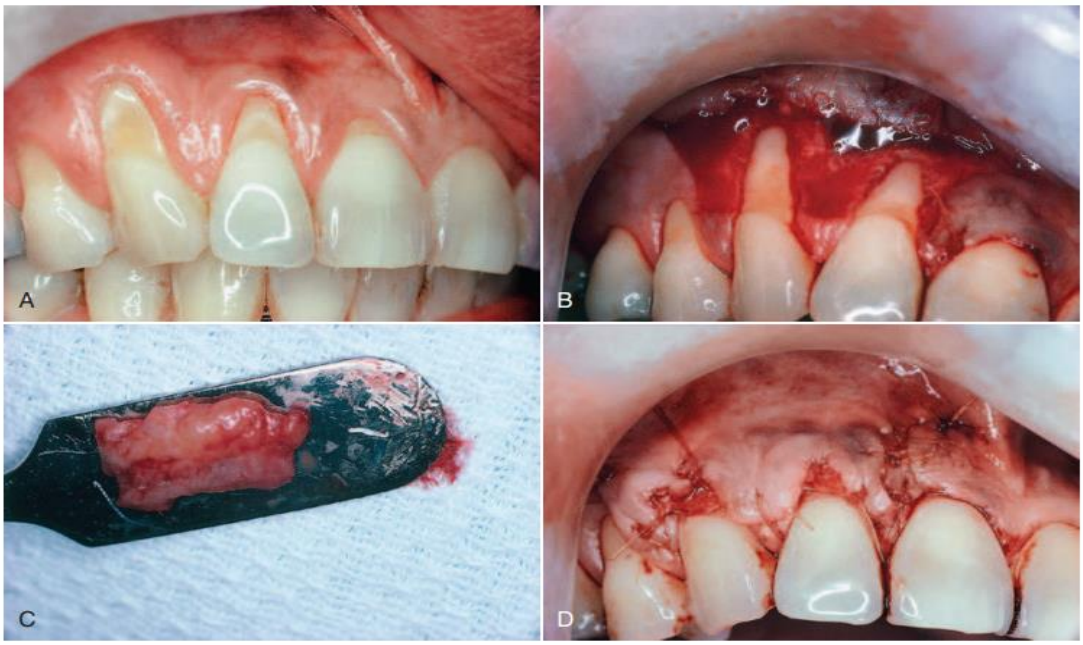

Figure (7) Langer technique for root coverage **A.** Preoperative view, showing the recession on teeth #6 to #8. **B.** Split-thickness flap is elevated on teeth #6 and #7. **C.** Connective tissue from the palate. **D.** Graft placed under the flap and covering receded areas approximately to the cementoenamel junction. Sutures are in place. **(Newman and Carranza 2018)**

Envelope technique

An alternative technique is to place the base of the connective tissue graft within an envelope prepared by an undermining partial-thickness incision from the soft tissue margin, i.e. part of the graft will rest on the root surface coronal to the soft tissue margin (Figure 8). With this technique the recipient site is prepared by an internal beveled incision to elimnate sulcular epithelium. an envelope is then prepared apically and laterally to the recession by split incisions. Depth has to be 3 to 5 mm in all directions. The preparation of the site apically should extend beyond the mucogingival junction to facilitate the placement of the connective tissue graft and to allow for coronal advancement of the mucosal flap at time of suturing. A connective tissue graft is obtained using the previous trap door approach which is then inserted into

the prepared envelope and positioned so that it covers the denuded root surface. The graft is then secured in position by suturing **(Raetzke, 1985; Allen, 1994).**

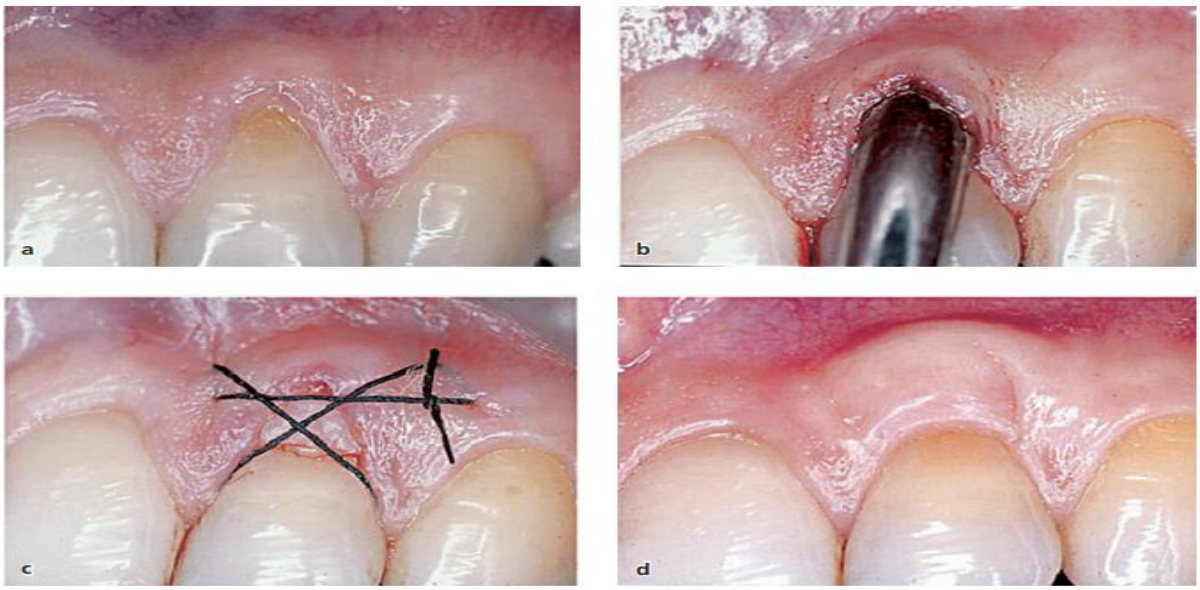

Figure (8) **(a-c)** Free connective tissue graft procedure – the "envelope" technique **(d)** the 1 year post treatment result. **(Jan L; Niklaus P, 2016)**

The tunnel technique:

The technique is used in case multiple adjacent recessions are to be treated, envelopes are prepared for each tooth as described above. However, the lateral split incisions are extended so that the multi-envelopes are connected mesially and distally to form a mucosal tunnel (Figure 9). Care should be taken to avoid detachment of the papillae. The graft is gently positioned inside the tunnel and its mesial and distal extremities are fixed with two interrupted sutures. **(Zabalegui et al. ,1999)**

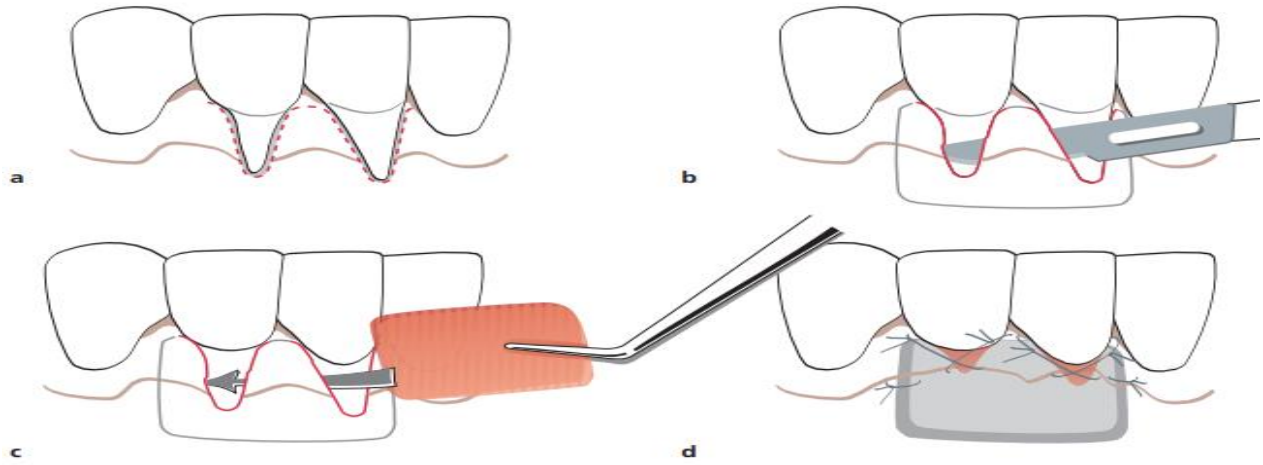

Figure (11) Free connective tissue graft procedure – the "tunnel technique". Schematic drawings illustrating the surgical technique

1.3.5 Factors affecting the success of periodontal surgery

Removal of restorations

Deep recessions of the maxillary canine are often a challenging problem, especially with the involvement of previous resin composite restorations (Figure 10). Although the procedure is the same for subepithelial connective tissue graft, additional consideration must be given to the complete removal of the resin composite restoration and aggressive root planning to ensure the complete removal of any foreign material before the placement of the graft. **(Hall WB, 1989)**

Figure (10) Wide deep recession, the tooth has been previously been treated with a resin composite restoration **(Thomas G, 1996)**

Damaged Root surfaces

Previously damaged root surfaces are often a problem to the clinician (Figure 11). In many cases, previous failures can be reversed by the use of subepithelial connective tissue graft. **(Laureen L; Laureen B, 1985)**

Figure 1 Marked area of hypermineralization from the midlabial to the distal line angle on the left maxillary central with severe recession **(Thomas G, 1996)**

Coverage of Existing crown margins

One of the difficulties encountered in restorative dentistry is when a gingival margin pulls away from the margins of recently placed crown which would draw the patient's attention to this one area of the reconstruction (Figure 12). Can also be treated with subepithelial connective tissue graft. **(Laureen L; Laureen B, 1985)**

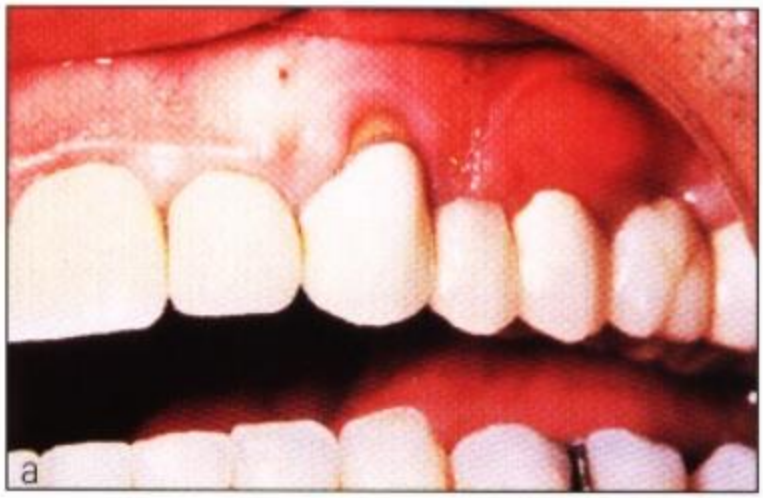

Figure (12) Maxillary right canine with recession adjacent to existing crown margin (**Thomas G, 1996)**

Chapter 2: Conclusion

Gingival recession is one of the main esthetic complaints of patients. This also exposes patients to sensitivity and greater risk for root caries. Mucogingival surgery endeavors to reestablish the periodontium to a healthy circumstance. Periodontal plastic surgery strives to restore the periodontium to a healthy, efficient, and aesthetic state.

The management of gingival recession and its sequelae is based on a thorough assessment of the etiological factors and the degree of involvement of the tissues.

The initial part of the management of the patient with gingival recession should be preventive and any pain should be managed and disease should be treated. The degree of gingival recession should be monitored for signs of further progression.

When esthetics is the priority and periodontal health is good then surgical root coverage is a potentially useful therapy.

Numerous therapeutic solutions for recession defects have been proposed in the periodontal literature and modified with time according to the evolution of clinical knowledge. Careful case selection and surgical management are critical if a successful outcome is to be achieved.

When developing a treatment strategy, clinicians should first focus on susceptibility factors and modifiable conditions while increasing the patient's awareness about gingival recession. In cases where a surgical approach is indicated, coronally advanced flap and combined with connective Tissue grafting are considered the most predictable treatment options for single and multiple recession defects. Allograft materials and GTR techniques also can be used to treat recessions, particularly when patients are reluctant to consent to providing gingiva donor sites

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