



PERIOESTHETIC MAKEOVER: TREATMENT OF MULTIPLE RECESSION DEFECTS USING TWO VARIANT ROOT COVERAGE TECHNIQUES – A CASE REPORT

Dental Science

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ABSTRACT

Gingival recession is a common occurrence and if treated gives predictable results. The cause should be found out and treated primarily. Various surgical procedures have been devised for the treatment of gingival recession. However in case of multiple recession defects a technique which would simultaneously cover all the defects is required to prevent multiple surgical appointments for patient convenience. This case report outlines two such root coverage techniques for multiple recession defects which show desirable results of root coverage – Zucchelli technique and pouch and tunnel technique with sub-epithelial connective tissue graft.

KEYWORDS

perioesthetics, esthetics, gingival recession, root coverage, Zucchelli's technique, pouch and tunnel, subepithelial connective tissue graft

INTRODUCTION

Gingival recession can be defined as the location of gingival margin apical to cemento-enamel junction^[1]. The cause of gingival recession could be due to vigorous toothbrushing or by destructive periodontal disease^[2]. Other predisposing factors include tooth malpositioning, tooth prominence in the arch, high frenum pull, occlusal trauma, lip piercing and iatrogenic factors^[3].

Gingival recession is often found in populations with good oral hygiene^[4,5] and may be associated with wedge-shaped defects in the cervical area of one or more teeth^[4].

Over the last few decades there has been a rapid development in the dental esthetic surgical procedures. Miller^[6] introduced the term 'Periodontal plastic surgery' which is defined as 'surgical procedures performed to prevent or correct anatomic, developmental, traumatic or disease-induced defects of the gingiva, alveolar mucosa or bone'^[7].

Various surgical procedures have been developed for root coverage. This case report shows use of two variant root coverage techniques for treatment of multiple recession defects – Zucchelli technique and Pouch and tunnel technique with subepithelial connective tissue graft.

CASE REPORT

A 31 year old male patient reported to the Department of Periodontics, Nair Hospital Dental College, Mumbai with the chief complaint of sensitivity to cold and sweet food and unesthetic appearance due to receding gums and hence, desired treatment for the same. Patient was systemically healthy. Patient used to brush vigorously which was found to be the cause for the gingival recession.

Gingival recession was present with respect to teeth 13, 14, 15 and 23, 24, 25, 26. The periodontium was healthy with no signs of inflammation. Traumatic occlusion was ruled out for the patient. Adequate width of attached gingiva was present. Scaling and root planing was done and oral hygiene instructions were given. Casts were fabricated for proper treatment planning.

Modified Stillman brushing technique was advised and the patient was kept on recall to ensure that the patient followed the same. After a period of 1 month, root coverage procedure by pouch and tunnel technique with subepithelial connective tissue graft for 13, 14, 15 and Zucchelli's modified coronally advanced flap technique for 23, 24, 25, 26 was planned for the patient. Informed consent for the procedure was obtained from the patient.

Pouch and Tunnel technique:^[8]

This technique is one described by Langer et al where multiple gingival recession areas can be covered using subepithelial connective tissue graft harvested from the palate^[9]. The most important criterion

for selecting this procedure was the sufficient thickness of the marginal and papillary gingiva at the site of the exposed root surfaces to facilitate complete undermining for creating the pouch and tunnel without detaching the papillary tip^[10]. This technique preserves the lateral and apical blood supply of flap by eliminating vertical incisions and accelerates the wound healing. Also, minimal trauma is involved at the recipient site by following tunnel approach.

Surgical Procedure:

On clinical examination, the patient was diagnosed to have Miller's Class I gingival recession present in relation to 13, 14, 15. The distance from the CEJ to gingival margin was found to be 1mm, 3.5mm and 3mm for 13, 14 and 15 respectively. Abrasion was present with respect to 14 and 15.

Disinfection of surgical site was done with 2% Povidone iodine. Prior to administration of local anaesthetic (Lignocaine HCl with 2% epinephrine 1:2,00,000) the pre-surgical rinse with 10ml of 0.2% Chlorhexidine gluconate was carried out to reduce the bacterial load. The root surfaces were thoroughly planed and conditioned using tetracycline solution. The tooth convexities were reduced by using a smooth diamond bur and a high speed handpiece.

A sulcular partial thickness incision was made through the recession area. The tissues were gradually undermined using tunnelling instrument including the base of the interdental papilla without involving the tip. This created a pouch further undermining the tissue far beyond the mucogingival junction so that there was adequate relaxation of the flap to allow placement of the connective tissue graft. Each pedicle adjacent to the recession was undermined gently by 3-5mm without detaching it completely to prepare the tunnel. Thus a pouch and tunnel was created for placement of the graft.

The connective tissue graft was harvested from the palate using trapdoor technique. The graft was trimmed according to the required dimensions and slid underneath the tunnel using a dull instrument like a periosteal elevator. The graft was positioned coronal to the CEJ and secured to the mesial and distal aspect with sling sutures to prevent its movement. The ends were sutured around the teeth.

The mucogingival complex was then advanced coronally and stabilised in a new position by using direct interrupted sutures (Vicryl 5-0) approximately 2-3mm apical to the gingival margin and tying the suture around the tooth with the knot stabilised by composite stops. The surgical area was covered with periodontal dressing.

Mild compression using saline dampened sterile gauze was applied for 5mins over the donor site to achieve haemostasis. The donor site was sutured adequately by placing interrupted and sling sutures around the adjacent teeth. A periodontal dressing was placed to protect the donor tissue.

Desired recession coverage was seen with good adaptation of the graft to the recipient site and increased colour matching. Composite restoration was done post surgery with respect to 14 and 15. Patient was kept under regular observation and followed up at intervals of 15 days, 1 month and 6 months.

Zucchelli technique:^[11]

This is a modification of coronally advanced flap technique^[12]. Typical features of Zucchelli's technique include the following – Absence of vertical releasing incision, variable thickness of tissue, combination of areas of split and full thickness flap, coronally repositioned flap and submarginal oblique incisions in the interdental areas connecting CEJ of one tooth to the gingival margin of adjacent tooth^[13].

Surgical Procedure:

Upon clinical examination, the patient was diagnosed to have Miller's Class I gingival recession on 23, 24, 25 and 26 with loss of attachment as 3mm, 3mm, 1mm and 2mm on respective teeth. Disinfection of surgical site was done using 0.2% Povidone iodine. Pre-surgical rinse of 0.2% Chlorhexidine gluconate 10ml was carried out to reduce the bacterial load. The procedure was carried out under local anaesthesia (Lignocaine HCl with 2% epinephrine 1:2,00,000).

The incision outline of the envelope flap was marked. The incision was extended to include one tooth on each side of the teeth to be treated to facilitate coronal repositioning for root coverage. The horizontal incision of the envelope flap consisted of oblique submarginal incisions in the interdental areas which continued as intrasulcular incision over the exposed root surfaces.

Incision was given obliquely connecting CEJ of one tooth to the gingival margin of adjacent tooth. The incision was carried out keeping the blade parallel to the long axis of the teeth in order to dissect in a partial thickness manner. A split thickness flap was thus reflected till the root exposure and further apically a full thickness flap was raised. A split thickness flap was again reflected beyond the mucogingival junction for adequate coronal displacement of the flap (split-full-split approach in corono-apical direction).

The anatomic interdental papilla was de-epithelialised to expose the underlying connective tissue and to eliminate the epithelium that might interfere with healing. Following flap reflection, thorough scaling and root planing was done using curettes. During coronal advancement of the flap, surgical papillae were rotated towards the end of the flap and displaced over the prepared connective tissue bed of the anatomic papillae. The flap was secured in place using sling sutures (Vicryl 5-0) which ensured precise adaptation of the flap. The surgical site was then covered with periodontal dressing.

The surgical site was assessed after 15 days, 1 month and 6 months. Healing was satisfactory. Adequate root coverage was obtained. The patient reported with satisfactory esthetic results and loss of hypersensitivity in the surgically treated area.

Post-operative instructions for both the surgeries:

The patient was instructed not to remove the periodontal pack or disturb the surgical site till the sutures were removed. The patient was advised to apply ice pack to minimise post-operative swelling. The patient was instructed to use 0.2% Chlorhexidine gluconate mouthwash twice daily for 2 weeks. Only gentle toothbrushing was permitted. Antibiotics and analgesics (Amoxicillin 500mg TDS and Diclofenac 50mg TDS) were prescribed for 3 days postoperatively to reduce pain and discomfort. Two weeks postoperatively the periodontal pack was removed. Oral hygiene instructions were reinforced everytime.



Figure 1: Pre-operative view with respect to 14,15



Figure 2: A sulcular partial-thickness incision through the recession area



Figure 3: The tissues are gradually undermined using tunnelling instrument including base of interdental papilla



Figure 4: Tunnelling patency established

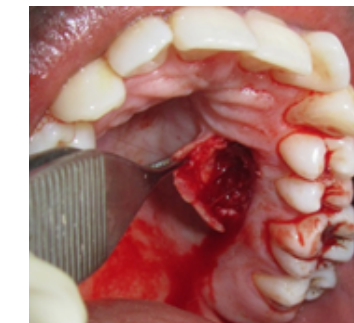


Figure 5: Harvesting connective tissue graft using trapdoor technique



Figure 6: Securing the graft to the mesial and distal aspect using sling sutures



Figure 7: Mucogingival complex advanced coronally and secured using sutures tied around the tooth stabilised by composite stops



Figure 8: The donor site sutured adequately using interrupted and sling sutures



Figure 9: Left quadrant pre-operative image



Figure 10: The incision outline of envelope flap



Figure 11: Combination of split-full-split thickness flap in a corono-apical direction and deepithelialisation of anatomic papilla



Figure 12: Surgical papillae rotated towards anatomic papillae and secured using sling sutures



Figure 13: Right quadrant post-operative view



Figure 14: Left quadrant post-operative view

DISCUSSION

Since many years there have been continuous efforts to devise a technique for gingival recession coverage. Langer devised subepithelial connective tissue grafting technique in 1985^[9]. Allen in 1994 modified the Raetzke's technique, and thus described the "Tunnel or supraperiosteal envelope technique," for treatment of multiple gingival recession^[8]. A mean root surface coverage of 91.6% was achieved using the tunnel technique with subepithelial connective tissue graft as reported by Zabaluigi et al^[11].

Certain advantages were achieved using this surgical approach which included the following:

1. The interdental papilla is preserved and this facilitates wound healing
2. Vertical incision is eliminated which results in no scar formation.
3. The use of connective tissue graft below the flap facilitates excellent colour matching and keratinised tissue gain.
4. Minimum trauma to the surgical site and satisfactory root coverage result.

The pouch and tunnel procedure is technique-sensitive and could result in following complications:

1. Bulky connective tissue underneath the flap which could require a gingivoplasty procedure.
2. Separation of the interdental papillary tip
3. Inadequate connective tissue harvesting

It is very important to achieve root coverage for aesthetic appearance. In case of gingival recession affecting multiple teeth, coronally advanced flap has been found to provide a predictable approach. It thus helps to reduce the number of surgical appointments. Zucchelli modified the 'coronally positioned flap' technique further in 2000^[11].

On an average 97% of the root surface initially exposed due to recession showed soft tissue coverage at 1 year examination and 88% of the cases showed complete coverage as reported by Zucchelli et al^[11].

The advantages using this surgical approach were as follows:

1. Lack of vertical incisions. So blood supply to the flap is not hampered and lack of unesthetic scars.
2. Facilitates coronal displacement of flap. This ensures good stability and anchorage.
3. No additional surgical site.
4. Facilitates keratinised tissue gain.

Certain complications could be achieved during this surgical procedure which are as follows:

1. Thinning of the flap thus leading to tearing while suturing or necrosis of the flap.
2. Failure to extend the incision to adjacent teeth which prevents coronal repositioning of the flap
3. Wrong placement of the oblique submarginal incisions

Despite the disadvantages, if both the surgical procedures are followed in a proper sequence and with patience, they result in successful and predictable root coverage as compared to the classical techniques.

CONCLUSION

This case report describes that both the techniques used here – Pouch and tunnel technique using subepithelial connective tissue graft and Zucchelli technique are useful for bringing about perioesthetic transformation irrespective of the number of gingival recession defects. Satisfactory root coverage and increase in the keratinised tissue could be achieved by these surgical procedures.

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