

Case Report**Root coverage with laterally moved, coronally advanced flap (Zucchelli's technique). A case report**

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Abstract: Need for improved aesthetics and cosmetic dentistry have increased tremendously in recent times making it an integral part of periodontal treatment. The treatment of choice for recession coverage should address the biological as well as the patient's aesthetic demands. Amongst many surgical techniques, pedicle flap surgical techniques (coronally advanced or rotated flaps) are recommended if there is adequate keratinized tissue close to the recession defect and the soft tissue utilized in this procedure is similar to that originally present at the buccal aspect of the tooth with the recession defect and thus the aesthetic result is more satisfactory. Furthermore, the postoperative course is less troublesome since other surgical sites far from the tooth with recession defect, (palate, for example) are not involved. Some unfavourable local anatomic conditions may render the coronally advanced flap contraindicated: 1) The absence of keratinized tissue apical to the recession defect; 2) The presence of gingival ("Stillman") cleft extending in alveolar mucosa; 3) the marginal insertion of frenuli; 4) The presence of deep root structure loss; or 5) Presence of a very shallow vestibulum. In these situations the clinician should take the soft tissues located laterally to the recession defect into consideration to evaluate the possibility to perform a laterally moved flap. Zucchelli and Cesari (2004) proposed a modification that combines both the surgical procedures into one procedure and named it laterally moved, coronally advanced flap. This case report highlights the Zucchelli's technique for root coverage in isolated type of recession defect.

Key words: Cosmetic dentistry; Pedicle flap; Zucchelli's technique; Periodontal; Frenum.

INTRODUCTION

Gingival recession is defined as exposure of the root surface due to the displacement of the gingival margin apical to the cement enamel junction (CEJ).¹ This results in an unaesthetic appearance, root hypersensitivity, and root caries.² The risk factors which have been postulated to play a role in the aetiology of gingival recession³ include tooth malposition, path of eruption, tooth shape, profile and position in the arch, alveolar bone dehiscence, muscle attachment and frenal pull, periodontal disease and treatment, iatrogenic restorative or operative treatment, improper oral hygiene methods, and other self-inflicted injuries (e.g. oral piercing). The most important factor increasing the risk of gingival recession is thin gingival biotype.³

The main goal of periodontal therapy is to improve periodontal health and thereby to maintain a patient's functional dentition throughout his/her life. However, aesthetics represents an inseparable part of today's oral therapy, and several procedures have been proposed to preserve or enhance patient aesthetics. The treatment of choice for

recession coverage should address the biological as well as the patient's aesthetic demands.⁴ The selection of one surgical technique over another depends on the local anatomic conditions of the site to be treated, other surgical goals (such as an increase in gingival thickness and/or in the depth of the vestibule or improvement in the quantity/quality of keratinized tissue) than root coverage, and the patient's needs. Local anatomic conditions relate both to the tooth and the adjacent soft tissues. With regards to the tooth, one must consider the dimension of the root exposure (width and depth), the number of recessions affecting adjacent teeth and the presence of cervical hard tissues loss associated with the root exposure.

The need to satisfy the patient's aesthetic request and to reduce patient morbidity mainly influences the selection of the surgical technique.⁵ This case report demonstrates the root coverage by laterally moved coronally advanced flap (Zucchelli's technique). This technique combines the aesthetic and root coverage advantages of the coronally advanced flap with the increase in gingival thickness and

keratinized tissue associated with the laterally moved flap.

CASE REPORT

A 45-year-old male patient visited the department of Periodontology, Saraswati Dental College & Hospital, Lucknow, U.P, with the chief complaint of sensitivity of tooth in the upper left front teeth region since 2 months. Clinical examination revealed 3mm Miller's Class I recession in left maxillary canine (Fig 1). Clinical probing of the sulcus for left maxillary canine did not exceed 3 mm. There was no bleeding on probing and the patient's overall oral hygiene was judged excellent. For the root coverage, periodontal plastic surgery was planned with laterally moved coronally advanced flap (Zuchelli technique). The patient was a non-smoker and in good health, with no contraindication to surgical periodontal therapy.

Surgical technique

The entire procedure was explained to the patient and written consent was obtained. A complete medical history, family history and blood investigations were carried out to rule out any contraindication for surgery. After administering local anesthesia (2% lignocaine hydrochloride with 1:80,000 epinephrine), the recipient area for the laterally moved flap was prepared. The flap recipient area resulted from the de-epithelialization of a triangular-shaped area delimited by three incisions: (1) A horizontal incision (extended 3 mm in the mesio-distal direction) at the level of the CEJ. (2) A vertical bevelled incision, parallel to the mesial gingival margin of the recession, extending in alveolar mucosa. (3) A bevelled intra sulcular incision along the distal gingival margin of the recession defect and extending into alveolar mucosa up to crossing the preceding vertical incision (Fig 2).

The de-epithelialization of this area was performed with a no.15 blade kept parallel to the external gingival surface. The flap design consisted of three incisions: a) The bevelled intra sulcular incision, which is the same as incision three of the recipient area. b) A horizontal sub marginal incision extending

in the mesio-distal direction 6 mm more than the width of the recession defect measured at the CEJ. c) A bevelled oblique vertical incision, extending into alveolar mucosa, parallel to the first intra sulcular incision (incision a). When the flap was moved in the distal-mesial direction (opposite to the direction of the lip muscle insertions) another short horizontal incision was performed at the most apical extension of this vertical incision (cut back) in order to facilitate mesial mobilization of the flap (Fig 3).

The flap was elevated mix-thickness. During flap elevation, the thickness of the flap varied depending on the thickness required for the central portion of the flap covering the a vascular root surface with respect to the most peripheral 3 mm extended area (the surgical papillae) covering the connective tissue beds prepared laterally to the root exposure (de-epithelialized anatomic papillae). The surgical papillae of the flap were elevated keeping the blade almost parallel to the long axis of the tooth, while the central portion of the flap was raised up with greater thickness using the blade with a 45° inclination with respect to the underlying bone surface. In this latter area, great care was taken to leave the periosteum protecting the underlying bone.

Once the mucogingival line was reached, flap elevation was continued split-thickness, keeping the blade parallel to the bone surface, to expose at least 5 mm of periosteum apical to the bone dehiscence of the tooth with the recession defect. Flap elevation was terminated when it was possible to passively move the flap laterally above the exposed root. In order to allow coronal advancement of the flap, all muscle insertions present were eliminated. This was done keeping the blade parallel to the external mucosal surface. Coronal mobilization of the flap was considered adequate when the marginal portion of the flap was able to passively reach a level coronal to the CEJ.

The root surface was mechanically treated with currets; only the portion of the exposed root with loss of clinical attachment was instrumented. Exposed root surface

belonging to area of anatomic bone dehiscence was not instrumented to avoid damaging connective tissue fibres still inserted in the root cementum. The remaining facial soft tissue of the anatomic interdental papillae was de-epithelialized to create connective tissue beds to which the surgical papillae of the laterally moved, coronally advanced flap were sutured. The suturing began with two interrupted periosteal sutures in the most apical extension of the vertical releasing incisions, then proceeded coronally, along the mesial vertical incision, with other interrupted sutures, each of them directed from the flap to the adjacent buccal soft tissue in the apical-coronal direction (Fig 4). After these

sutures, the most marginal portion of the flap was stable in the coronal position with sling suture. After suturing, periodontal dressing was given (Fig 5). Patient was discharged with all post surgical instructions and medications for 5 days to avoid post operative pain and swelling. Patient was recalled after 7 days for suture removal. The surgical site was examined for uneventful healing. There were no post operative complications and healing was satisfactory with significant root coverage and significant gain in attached gingiva. Patient was instructed to use soft toothbrush for mechanical plaque control in surgical area and the patient was re-evaluated after three months.



Fig 1(a&b):- Preoperative photograph showing 3x3 mm deep gingival recession in left maxillary canine



Fig 2:-Prepared recipient site

Fig 3:- flap from the donor site is laterally moved and coronally advanced to cover the gingival recession.

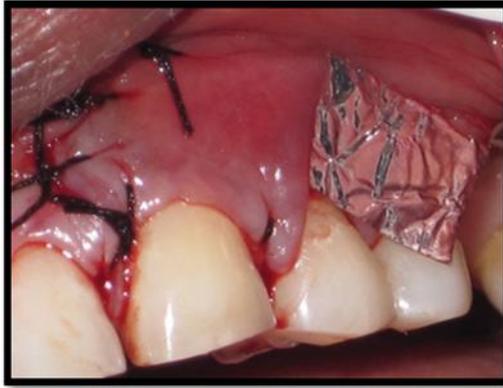


Fig 4:- Flap sutured on the recipient site and silver foil placed on the donor site

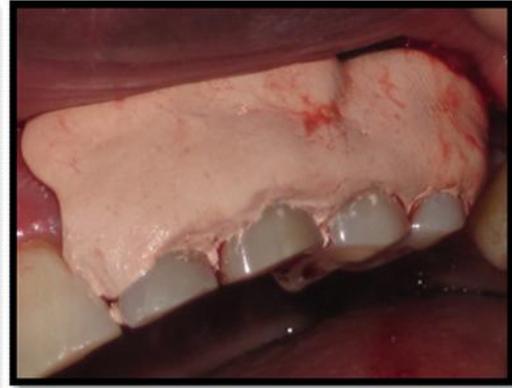


Fig 5:- Periodontal dressing



Fig 6:- One month post-operative



Fig 7:- Three months post-operative

DISCUSSION

The ultimate goal of periodontal plastic surgical procedure utilized in the treatment of marginal tissue recession is the complete regeneration of all the supporting components of the periodontium, resulting in complete coverage of the denuded root surfaces in an aesthetic and natural appearance as well as in a functional manner.⁶The available literature has documented that gingival recession can be successfully treated by means of several surgical approaches, irrespective of the technique utilized, provided that the biologic conditions for accomplishing root coverage are satisfied; i.e., no loss of interdental soft and hard tissues height.⁷

The selection of one instead of another surgical technique depends on the local anatomic characteristics of the site to be treated and on the patient's demands. In such patients, pedicle flap surgical techniques (coronally advanced or rotated flaps) are

recommended if there is adequate keratinized tissue close to the recession defect.⁸ In these surgical approaches, the soft tissue utilized to cover the root exposure is similar to that originally present at the buccal aspect of the tooth with the recession defect and thus the aesthetic result is more satisfactory.⁹ Furthermore, the postoperative course is less troublesome since other surgical sites far from the tooth with recession defect, (palate, for example) are not involved.¹⁰

The present case report showed high percentage of root coverage with no gingival recession at the donor site/tooth at 3 months follow-up. Thus this case report showed that laterally -moved coronally advanced surgical approach was effective in treating an isolated gingival recession type and the result remained stable over a 3-months period, indicating that this surgical approach is highly effective and predictable in obtaining root coverage of isolated gingival recession type defects. The post operative

aesthetic result was satisfactory for the patient. The secondary outcome variables were recession reduction, clinical attachment gain, keratinized tissue gain, aesthetic satisfaction, reduced root sensitivity, and reduced post operative patient pain. The studies revealed that the limiting condition for performing the laterally moved flap as a root coverage surgical procedure was the presence of keratinized tissue lateral to the recession defect.

Although, previous studies did not quantify the minimum width and height of keratinized tissue which must be present lateral to gingival defects in order to render the laterally moved flap a predictable root coverage surgical procedure. However, a certain amount of the lateral keratinized tissue, must be preserved *in situ* to prevent gingival recession at the donor site/tooth, while the remaining part is used to cover the exposed root surface and the adjacent connective tissue beds.¹¹

CONCLUSION: The surgical approach described in this case report resulted in a good clinical result and limited the discomfort to a single surgical site. The only limitation to this technique is represented by the anatomic conformation of the tissues adjacent to the recession defect, especially in terms of width and height of keratinized gingiva.

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