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RECESSION COVERAGE USING PERIOSTEAL PEDICLE GRAFT WITH VESTIBULOPLASTY – A CASE REPORT

Periodontics

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ABSTRACT

The periosteum is a highly cellular and vascular tissue with a potential of regeneration- making it a suitable autogenous graft. In this case report, a technique utilizing autogenous periosteal pedicle graft (PPG) for the treatment of single tooth gingival recession has been described. Patient with Miller's Class II recession defect in lower left central incisor, was treated with both vestibular deepening procedure and recession coverage using periosteal pedicle graft. At the end of two months, complete coverage of the recession defect and and increase in the width of attached gingiva was observed. Hence, the periosteal pedicle graft technique can be used successfully for the treatment of localised gingival recession defects.

KEYWORDS

Periosteum, Periosteal Pedicle Graft, Vestibuloplasty, Gingival Recession, Tunneling

INTRODUCTION

Gingival recession is defined as the displacement of the marginal tissue apical to the cemento-enamel junction. Histologically, the destruction of gingival tissues, due to mechanical forces or related to inflammatory periodontal disease, is associated with loss of periodontal connective tissue fibers and alveolar bone. As a consequence, exposure of the root surface to oral environment will occur.[1]

During recent decades, different surgical procedures have been proposed for the treatment of gingival recession. Coronally advanced flaps (CAFs), laterally repositioned flaps, free gingival grafts (FGGs), and sub-epithelial connective tissue grafts (SCTGs) have appeared as novel approaches to achieve improvements in recession depth, clinical attachment level, and width of keratinized tissue.[2]

A graft which has its own blood supply and one which can be harvested adjacent to the recession defect in sufficient amounts without requiring any second surgical site is the most suitable type of graft as it would have the potential to promote the regeneration of lost periodontal tissue.[3]

Various authors in the last few years have come up with novel techniques which eliminate the need for secondary surgical site associated with the usage of autogenous grafts. One such procedure is the use of periosteal graft for recession coverage. The human adult periosteum is highly vascular and is known to contain regenerative potential due to the presence of progenitor cells and stem cell that can differentiate into osteoblast , fibroblast and myocytes. [4]

Mahajan has described one such novel procedure for recession coverage by utilizing the periosteal pedicle graft for the treatment of Miller Class I and II recession defects. This graft utilizes the osteogenic potential of the periosteum for gingival recession treatment. [3]

The present case report describes a similar technique where vestibular deepening was carried out with the fenestration technique and a layer of incised periosteum was used as a pedicle graft for the treatment of a single tooth gingival recession.

Case Study

A 32 year old male patient reported to the Department of Periodontics, AJ Institute of Dental Sciences with the chief complaint of unesthetic appearance of his front lower tooth which appeared after completion of orthodontic treatment. On clinical examination, a 5 mm deep and 3 mm wide Miller's Class II gingival recession was present on the lower left central incisor with an inadequate vestibular depth and width of attached gingiva[1] (Fig. 1). Based on the clinical findings, a technique involving both vestibular deepening and root coverage procedures utilising the periosteal pedicle graft was planned. An informed consent was obtained from the patient.

The patient received full-mouth scaling and root planing, polishing and individualized oral hygiene instructions prior to scheduled surgery.

Procedure

Surgical protocols and safety guidelines were followed prior to the surgery. Bilateral mental nerve block using 2% lignocaine with 1:2,00,000 adrenaline was administered to achieve adequate anaesthesia. Root planing was done on the exposed root surface using a curette. With a no.15 surgical blade, horizontal incision was made at the mucogingival junction and a sharp split-thickness flap was reflected, dissecting muscle fibers and tissue from the periosteum (Fig. 2) . At the recipient site, an intracrevicular incision was made. The incisions were followed by split-thickness dissection on the facial surface, up to the level of the first vestibular incision so as to create a tunnel (Fig. 3) .At the level of the mucogingival junction, a strip of periosteum was removed from the mesial side, still pedicled to the bone and the rest of the surrounding periosteum. At this site after raising the periosteum a fenestration was created exposing the bone. Care was taken to preserve the periosteal strip as a pedicle and not to detach it completely (Fig. 4). This pedicled periosteal donor tissue was moved towards the recession area by passing underneath the tunnel (Fig. 5). The repositioned periosteum was closely adapted to the recession defect with a sling suture using 5-0 resorbable vicryl sutures. The graft was secured by suturing on the lateral aspect to prevent movement with simple interrupted suture. In the vestibular region, periosteal suture were placed using 4-0 resorbable vicrlyl to secure the vestibule to a new apical position (Fig. 6). Surgical site was protected using pack. Post-operative instructions were given and analgesics and antibiotics were prescribed . Post-operative evaluation was done at 1week , 2weeks and 1month intervals (Fig. 7)

Fig 1: Miller's Class II gingival recession

Fig 2: horizontal incision was made at the mucogingival junction

Fig 3 split-thickness dissection on the facial surface

Fig 4 : periosteal pedicle graft

Fig5: periosteal graft passed underneath the tunnel covering the recession

Fig 6: Repositioned periosteum closely adapted to the recession defect with sutures

Fig 7 : 1 month postoperative

DISCUSSION

The goals for surgical treatment of gingival recession are to reduce root sensitivity, improve esthetics, increase the zone of attached gingiva and to minimize root caries.

The periosteum is comprised of two layers, the inner cellular or cambium layer that contains numerous osteoblasts and progenitor cells and an outer fibrous layer composed of dense collagen fibres and fibroblasts and their progenitor cells.[5] The cells of the periosteum retain the ability to differentiate into fibroblasts, osteoblasts, chondrocytes, adipocytes, and skeletal myocytes in all age groups. The tissues produced by these cells include cementum with the periodontal ligament fibers and bone.[4] H. E. Bourke et al, in a study showed that, periosteal cells release vascular endothelial growth factor and induce angiogenesis.[6] In a case series by Mahajan, twenty teeth in six subjects with Miller Class I and II recessions were treated using periosteal pedicled grafts and at the end of 1 year, 90.95% of root coverage was attained with a significant increase in the widthof attached gingiva.[7]

Shah et al in a case report described a technique where the vestibular deepening was carried out with the fenestration technique and the layer of periosteum was incised and was used as a pedicle graft for the treatment of a single tooth gingival recession showing satisfactory results.[8] Similar technique was followed by Shubham Kumar et al and they reported this technique as a successful and viable alternative for the coverage of localized gingival recessions withan inadequate vestibular depth.[9] Rajpal et al reported an excellent post-operative outcome of root coverage and increase in width of attached gingiva and keratinized gingiva with vestibular deepening and periosteal fenestration technique.[10] The present study was based on similar technique where we obtained satisfactory clinical results.

The success of this technique may be due to the high vascularity of the graft, high patient comfort, reduced intraoperative time due to the single surgical site, minimum post-operative complications and the low cost of treatment.

The periosteal pedicle graft has shown great efficiency in terms of successful root coverage. However, limited studies are available in literature that have mentioned the use of periosteum for the treatment of gingival recession defects successfully.

CONCLUSIONS

With various advantages of using periosteal pedicle graft, it can be concluded that a periosteal pedicled graft, when combined with a fenestration technique for vestibular deepening, offers a successful and viable alternative for the coverage of localized gingival recessions with an inadequate width of attached gingiva. However, the technique has its own limitations. Although simple, it requires dexterity of a skilled clinician for atraumatic handling of the periosteal tissue. Further long-term studies are required assessing its efficacy when compared with already existing techniques for its implementation into regular clinical practice for gingival recession coverage

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