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PERIODONTAL SURGICAL INTERVENTION TO RESOLVE IATROGENIC MUCOGINGIVAL PROBLEM : USING THE INVERSELY PLACED PERIOSTEAL PEDICLE GRAFT – A ONE YEAR FOLLOW UP—A CASE REPORT.

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ABSTRACT:

AIM: This case report presents one such case which has been successfully treated using inversely placed periosteal pedicle graft. **BACKGROUND:** Various periodontal surgical procedures have evolved over time for obtaining complete root coverage of isolated single tooth miller's class I and class II gingival recession defects. **CASE DESCRIPTION:** inversely placed Periosteal pedicle graft is a latest innovation in root coverage procedures where periosteum is used for recession coverage. This pedicled graft utilises the osteogenic potential of the periosteum which is due to its highly vascular nature, presence of fibroblasts, osteoblasts and stem cells. In this case single isolated Millers Class II recession defects was treated in a single surgery using this latest technique. **CONCLUSION:** The results obtained 1 year post operatively there was significant reduction in height and width of recession (Root coverage Achieved was 100%), increase in width of attached gingiva, Clinical Attachment Level' were quite encouraging to use it on a regular basis for root coverage. **CLINICAL SIGNIFICANCE:** A newer less invasive modality to treat both sensitivity and unesthetic appearance due to gingival recession. obtaining predictable and esthetic root coverage has become an important part of periodontal therapy. Several techniques have been developed to obtain these results with variable outcomes.

KEYWORDS: PPG- Periosteal pedicle graft, Root Coverage, Recession.

INTRODUCTION

Gingival aesthetics, for a long time the exclusive concern of the periodontist, has now become one of the chief aesthetic challenges presented to the practicing orthodontist. The late 1980-90s, this is an increased focus on dentofacial aesthetics in the adult population[1]. An adequate amount of Attached gingiva is necessary for gingival health and to allow appliances (functional or orthopedic) to deliver orthodontic forces without causing bone loss and gingival recession. In the presence of inflammation with labial bodily movement, incisors showed apical displacement of the gingival margin along with loss of connective tissue attachment[2]. Therefore the tooth mobility is expected to result in a reduction of soft tissue thickness and an alveolar bone dehiscence may have occurred in the presence of inflammation, gingival recession is also a risk.[2]

The gingival recession has been shown to be a common adverse effect during and/or after the orthodontic labial forces. This effect has been noted more frequently after the application of orthodontic tooth movement is in a labial direction, this mucosal problems may require a soft tissue graft. For best esthetics in the anterior areas, a periosteal pedicle graft is preferred. Because the advantages of periosteal pedicle graft are the adult human periosteum is highly vascular and is contain fibroblasts, osteoblasts, progenitor cells and their stem cells. In all age groups, the cells of the periosteum stem cells retain the ability to differentiate into fibroblasts, osteoblasts, chondrocytes, adipocytes, and skeletal myocytes. So periosteum has greater regenerative potential to formation of periodontal ligament fibres and bone.[3] The purpose of this case -report to evaluate the results of technique that utilizes the mucosal periosteum as an pedicle autograft for the treatment of gingival recession defects.

Case report

A 18 year old female patient reported to the Department of Orthodontics, G. Pulla Reddy Dental college and Hospital, Kurnool, India, with chief complaint of malocclusion. she had class I molar relation with single tooth cross bite in relation to upper right central incisor and lower right central incisor with crowding in the lower arch **(Fig.1.)** She was undergone orthodontic treatment for

correction of malocclusion. The patient had developed localized class II type gingival recession in relation to 41. At the end of orthodontic treatment the patient referred to periodontology department for the treatment of isolated single tooth gingival recession defect in relation to 41 **(Fig.2.)** The patient has normal systemic health with no contraindications for periodontal surgery. She was explained about the surgery and signed informed consent taken by the patient.. Before surgery routine laboratory investigation was advised, non –surgical therapy was performed and oral hygiene instructions are advised to the patient. Four weeks after phase I therapy, the patient was undergone for surgical procedure.

Clinical parameters

Before surgical procedure the following parameters were measured : Recession depth, distance between cemento-enamel junction (CEJ) and the most apical point of the gingival margin (GM)-i.e 5mm; probing depth i.e 1 mm were calculated and there was 1mm attached gingiva, 2mm keratinized gingiva.GM-1mm were calculated and there was 1mm attached gingiva, and 2mm keratinized gingiva. Recession depth (RD), probing depth (PD) recession width (RD) attached gingiva(AG), keratinized gingiva(K G) were measured .5mm, 1mm, 3mm,1mmand2mm respectively.

Fig.1. pretreatment photograph at the initial visit

Fig.2. photograph showing the fourth stage of Orthodontic Treatment- class II LOC gingival recession irt 41

Fig.3. inversely placement of perosteal pedicle graft

Fig.4. Suturing

Surgical Procedure

After infiltration of 2% xylocaine at both labial and lingual mucosal areaof surgical site, the periosteal pedicle graft surgical procedure was done before debonding of the fixed orthodontic appliance. Two vertical incisions were given at the mesial line angles of 42 and distal line angle of 31beyond the muco-gingival junction. The horizontal incision was given to split buccal and lingual papilla. Then from the bone margins full thickness flap was raised beyond the mucogingival junction. The flap was buccally pulled to create a tension on the periosteum. An horizontal incision was made through the periosteum where the flap was still attached to the bone to create a periosteal pedicle graft **(Fig.3.)**. Then the process of splitting, the papilla raising full thickness flap with the help of no. 12 BP blade and periosteal elevator was lifted slowly in a coronal direction o mucogingival junction. The periosteum was not separated completely and left it attached at its coronal most ends. Thus the PPG was obtained and turned over the exposed root surtace and sutured with a 4-0 absorbable ethicon suture**(Fig.4.)**. After stabilising the PPG the full thick-ness flap was coronally positioned and sutured using a sling-suture technique with a black silk 4-0 non absorbable suture. The releasing incisions were closed with interrupted sutures after which the operated site was covered with tin foil, non-eugenol periodontal dressing for protection.

Results

Patient was recalled postoperatively after 1week**(Fig.5)**, 1month **(Fig.6)**, 3months **(Fig.7)** and 6 months**(Fig.8)** to evaluate the healing of gingiva. Healing was uneventful. On observation there was a total reduction of recession width and depth with Increased attached gingiva and also excellent morphologic and chromatic resemblance. Thus 100% root coverage was obtained with periosteal pedicle graft with increase of 5mm length and 3mm width.

Discussion

The main goal of periodontal therapy is to improve periodontal health and thereby to maintain a patient's functional dentition throughout his/her life.[4] one of the most common aesthetic concerns associated with the periodontal tissue is gingival recession. Gingival recession is defined as the location of the gingival margin apical to the cement-enamel junction.[5] It is observed more frequently on the labial/buccal surface of the teeth and is probably one of the most common esthetic concerns associated with the periodontal tissues.It has been associated with many factors such as inflammatory periodontal disease, developmental anatomic abnormalities (aberrant frenal attachment, tooth malposition, root prominence and thin buccalbony plate), toothbrush injury, trauma from occlusion and iatrogenic factors. Some classifications of recession indicate the degree of success and predictability for obtaining favorable surgical outcomes. In general, complete root coverage is achieved in Miller Class I and II recession defects, whereas only partial root coverage is usually achieved in Miller Class III defects.[6] Several surgical techniques have been developed to correct the gingival recession defects.[3,4] The object of developing new techniques are to increase predictability and to reduce patients discomfort and the number of surgical sites, together with the need to satisfy the patient's esthetic demands, which include the final color and tissue blend of the grafted area,[7] to get these using more appropriate technique.

In general grafting procedures the main drawback is necrosis of the graft due to lack of blood supply. The ideal requirement of pedicle graft is that it should have its own blood supply and potential for promoting the regeneration of lost periodontal structures. The adult human periosteum is highly vascular and comprises of atleast two layers, an inner cellular layer or cambium layer and outer fibrous layer. The inner layer contains numerous osteoblasts and osteoprogenitor cells and the outer layer is composed of dense collagen fiber, fibroblasts and their progenitor cells. Because of the osteogenic potentiality of periosteum it has been considered as a grafting material for the repair of bone and joint defects. [8,9] Periosteal pedicle graft is popular from few years few studies which have mentioned the use of periosteum for the treatment of gingival recession defects successfully. Mahajan reported the successful treatment outcome by using PPG for treating gingival recession defects'.[3,10] Lekovic et al and Kwam et al used periosteum as a barrier membrane for fhe treatment of periodontal defects in their studies.[11,12,13] A recent study reported that periosteal cells release a vascular endothelial growth factor[14]. Harshavardhana[15] did a case report using PPG in multiple gingival recession defects. Complete root coverage was achievable in that case. The characteristic advantage is because of pedicle attachment to the bone and the coronally positioning the flap over the graft ensuring good protection of the graft. It becomes evident that the thickness of the graft harvested is very important criterion for success. Mishalpiyush[16] did a case report of periosteal pedicle graft. 5mm deep and 3mm wide millers class II gingival recession. At 6 months postoperatively root coverage was 100% at the recipient site, with minimal probing depth, no inflammation and a favorable esthetic result.

The present case report successfully demonstrated a technique utilizing the periosteum as an autograft for the treatment of gingival recession defect. The advantages of PPG over the gold standard technique of subepithelial connective tissue graft for treating the gingival recession, periosteal pedicle graft does not require second surgical site to obtain a donor tissue, sufficient amount of tissue can be obtained from mucosal area , no dual site surgical trauma, less postoperative complications and better patient satisfaction. The present case report has excellent

Fig.5. Post operative 1 month

Fig.6. Post operative 3 months

Fig.7. Post operative 6 months

Fig.8. Post operative 12 month

postoperative outcome showing greater coverage of exposed root surface and increase in width of attached gingiva and keratinized gingiva. The success of the technique may be due to the high vascularity of the graft, the single surgical site, patient comfort, reduced intraoperative time and minimum postoperative complications.

CONCLUSION

In conclusion, this case report illustrates the surgical procedures i.e. inversely placed periosteal pedicle graft is proved to be clinically successful procedures in the treatment of Miller's Class I and Class II gingival recession defects. The better aesthetics, complete root coverage and patient satisfaction obtained by the PPG may be attributed to the less traumatic surgical procedure which involved harvesting of the graft adjacent to the gingival recession defect.Finally to assess the regenerative potentiality of PPG further clinical and histologic studies are to be carried out in future. The interdisciplinarytreatment approaches leads to an optimal qualitative, functional and aesthetic management, providing the best treatment plan in complex clinical conditions.

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