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RESEARCH ARTICLE

MANAGEMENT OF MILLERS CLASS II GINGIVAL RECESSION USING CORONALLY ADVANCED FLAP WITH DE-EPITHELIALIZED FREE GINGIVAL GRAFT: A CASE REPORT

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Abstract

Gingival recession refers to the apical displacement of gingival margin, resulting in exposure of the root surface within the oral environment. This case report describes the treatment of a Miller's Class II gingival recession defect in the mandibular anterior region using a coronally advanced flap (CAF) in combination with a de epithelialized free gingi val graft (DFGG). The patient presented with chief complaint of root sensitivity in lower front tooth. Following clinical evaluation, mucogingival surgery was planned using coronally advanced flap with de-epithelialized free gingival graft. At 3 months follow-up substantial root coverage was observed along with resolution of hypersensitivity.

Introduction:-

The gingival margin is usually seen as a scalloped line that closely follows the contour of the cementoenamel junction, generally lying 1–2 mm coronal to it. Gingival recession is characterized by the apical migration of the gingival margin beyond the cemento-enamel junction (CEJ), resulting in the exposure of the root surface to the oral environment. This condition is frequently associated with dentinal hypersensitivity, aesthetic concerns, and an increased susceptibility to root caries. To address this issue, various root coverage procedures have been developed, with the coronally advanced flap (CAF) combined with a connective tissue graft (CTG) being considered the gold standard, especially for the treatment of buccal gingival recessions classified as Miller's Class I and II, offering highly predictable outcomes and favorable long-term clinical results. [1]. Subepithelial connective tissue grafts (SCTG) present several drawbacks, such as increased patient discomfort, longer surgical time, technical sensitivity, and the potential for palatal tissue sloughing. To address these limitations, Zucchelli et al., introduced the de-epithelialized free gingival graft (DFGG), which is de-epithelialized outside the oral cavity. This technique enables connective tissue graft harvesting regardless of the thickness of the palatal fibromucosa [2]. Tavelli et al., in a recent meta-analysis, found that using DFGG with CAF yielded superior root coverage compared to SCTG, and advocated for DFGG as a reliable technique for CTG harvesting [3]. The aim of this case report is to describe the surgical management of a Miller's Class II gingival recession in the mandibular anterior region using a coronally advanced flap (CAF) with a de-epithelialized free gingival graft (DFGG), and to assess its effectiveness in achieving root coverage.

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Case Report:

A 39-year-old male patient reported to the Outpatient Department of Dr. R. Ahmed Dental College and Hospital with the chief complaint of sensitivity in a lower anterior tooth when consuming hot or cold food. The patient was a non-smoker and had no history of systemic illness.

On clinical examination, gingival recession extending to the mucogingival junction was observed on teeth #31 and #33**(Figure 1)**. Due to the patient's complaint of pronounced hypersensitivity in relation to tooth #31, treatment was initially planned and carried out for this tooth. This case report focuses on the surgical management of tooth #31.

Figure 1- Preoperative view showing Class II gingival recession in relation to tooth #31 & #33

Vitality tests confirmed that the tooth was vital. Probing pocket depth of #31 was 2mm, Clinical attachment loss was 9mm and recession depth (CAL-PPD) was 7mm on the buccal aspect **(Figures 2 & 3)**. Radiographic evaluation revealed no signs of interdental alveolar bone loss in relation to #31. Based on these clinical and radiographic findings, the case was diagnosed as Miller's Class II gingival recession in relation to tooth #31 **(Figure 4)**.

Figure 2:- Probing Pocket depth & Clinical attachment Loss.

Figure 3:- Recession Depth.

Figure 4:- Radiograph.

Following clinical and radiographic evaluation, a comprehensive treatment plan was devised. It involved an initial phase of cause-related therapy, which included thorough oral hygiene instructions, supragingival and subgingival scaling, and reinforcement of proper brushing techniques to eliminate contributing factors. Once adequate plaque control was achieved and gingival inflammation was resolved, the surgical phase was initiated.

The selected surgical approach for managing the gingival recession in relation to tooth #31 was a coronally advanced flap (CAF) in conjunction with a de-epithelialized free gingival graft (DFGG). This technique was chosen due to its predictability and effectiveness in achieving root coverage, particularly in Miller's Class II defects.

Prior to the surgical procedure, informed consent was obtained from the patient after explaining the nature, benefits, and potential risks of the treatment.

The surgical technique for gingival recession coverage was a trapezoidal-type of CAF [4], fully covering a CTG obtained by means of de-epithelialization of a free gingival graft [2]. Under local anaesthesia, two horizontal incisions were made on the mesial and distal sides of the gingival recession (GR), followed by two beveled oblique slightly diverging incisions extending into the alveolar mucosa using #15c blade **(Figure 5)**. A trapezoidal flap was then elevated using a "split-full-split" technique **(Figure 6)**. The natural interdental papillae were de-epithelialized to create connective tissue beds for the placement and suturing of the surgical papillae.

Figure 5:- Incisions placed.

Figure 6:- Flap elevation.

The free gingival graft (FGG) was harvested from the palate following the technique described by Zucchelli et al. [2], using two horizontal and two vertical incisions to define the graft boundaries, with the coronal horizontal incision as the starting point. Initially, the blade was positioned perpendicular to the palatal surface, and once the desired soft tissue thickness was reached, it was angled to run nearly parallel to the surface. After the graft was removed, adipose tissue was carefully trimmed away. The graft was de-epithelialized extraorally using a #15C blade and trimmed to an approximate thickness of 1 mm **(Figure 7)**.

Figure 7:- De-epithelialization of Free Gingival Graft (DFGG).

Following mechanical debridement of the exposed root surface using a Mini-Five® Gracey curette (GDC Dental, India), the connective tissue graft (CTG) was placed at the level of the cementoenamel junction (CEJ) and secured to the de-epithelialized papillae with single interrupted sutures using 5-0 resorbable suture material (Truglyde®, Healthium Medtech Limited, India). The flap was then repositioned to lie at least 1 mm coronal to the CEJ [5] **(Figure 8)**. Suturing began with two apical interrupted periosteal sutures, securing the flap to the surrounding soft tissue using 5-0 resorbable sutures. The suturing then progressed in a coronal direction, with a final sling suture applied to ensure proper stabilization and adaptation of the flap **(Figure 9)**.

Figure 8- Graft secured at level of CEJ.

Figure 9:- Flap Sutured.

Post-operative systemic antibiotics were prescribed for 7 days and anaelgesics were prescribed for 5 days. Patients were advised to avoid brushing the treated area and instead rinse twice daily for one minute with a 0.2% chlorhexidine solution. Sutures were removed after 14 days and then patients were instructed to gently brush the operated area with a soft tooth brush using roll technique **(Figure 10)** [2].

Figure 10:- Post suture removal at 14 days.

Patient was recalled at 1month and then at 3 months after surgery. At 3 months a gain of 5 mm in clinical attachment level was recorded. The baseline recession depth was 7 mm, and at 3 months remainder recession depth was 2mm, resulting in root coverage upto 71% **(Figure 11)**. The width of keratinized tissue at the treated site was increased to 3mm. Additionally, patient did not complain of hypersensitivity in the surgically treated tooth.

Figure 11:- At 3 months follow up.

Discussion:-

The ongoing pursuit in periodontal research is to develop more efficient connective tissue graft (CTG) harvesting techniques that reduce patient morbidity while improving graft quality to enhance root coverage outcomes. One such advancement is the de-epithelialized free gingival graft (DFGG) technique, proposed by Zucchelli et al. [2], which offers several advantages over the conventional subepithelial connective tissue graft (SCTG). The DFGG is characterized by its increased density, firmness, and dimensional stability, features that contribute to improved handling and potentially better clinical performance during root coverage procedures [6]. Despite the potential risk of inadvertently including epithelial remnants within the graft during DFGG harvesting, a human histological study revealed that such remnants were present in approximately 80% of CTG samples and did not negatively impact the success of root coverage [7].

In this study we achieved recession coverage of 71.4% using CAF with DFGG. However, in previous study by Mashley et al, it was seen that 96.4% root coverage was achieved at 6 month follow up [8]. This discrepancy may be attributed to variations in gingival biotype, oral hygiene status which could influence the outcomes.In addition to this, an increase in keratinized tissue width upto 3mm was also observed which was consistent with the previous studies by Zucchelli et al. [2]. Zucchelli et al. also reported inferior outcomes when the labial submucosal tissue at the recipient site was not removed, with mean root coverage dropping to 48% compared to 88% when it was excised, highlighting the importance of proper recipient site preparation for optimal results with DFGG [9].

Another important consideration in the evaluation of root coverage outcomes is the phenomenon of creeping attachment, defined as the gradual coronal migration of the gingival margin over a previously exposed root surface

following surgical root coverage procedures. This biological process typically occurs within the first 6 to 12 months postoperatively and can contribute to improved esthetic and clinical outcomes over time. Although this study reported 71.4% root coverage at 6 months, it is possible that additional coronal tissue migration may occur beyond this period, potentially enhancing the final result.
Long-term follow-up may provide further insights into the potential for achieving complete root coverage and sustained soft tissue stability with the DFGG technique.

Conclusion:-

Within the limitations of this study, it can be concluded that the use of a de-epithelialized free gingival graft (DFGG) in combination with a coronally advanced flap (CAF) is a reliable and effective technique for the treatment of Miller's Class II gingival recession. This approach resulted in significant improvements in clinical parameters, including increased keratinized tissue width, along with root coverage of 71.4% at 3 months as well as resolution of hypersensitivity. These outcomes support the clinical applicability of the DFGG technique as a viable alternative to conventional subepithelial connective tissue grafts. Investigating minimally invasive approaches or adjunctive use of biologics (e.g., growth factors or PRF) with DFGG could further enhance healing and patient comfort. Further studies with larger sample sizes and extended follow-up periods are recommended to validate these findings and assess long-term stability.

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None

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