Enamel Matrix Derivative with CAF: A Promising Root Coverage Therapy

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ABSTRACT

Gingival recession is multifactorial, including periodontal disease, faulty tooth brushing, iatrogenic factors like orthodontic movement, poor restorations and anatomical factors such as tooth malposition and frenum pull. Various techniques have been proposed for successful coverage of exposed root. In recent literature combination of EMD with a CAF has been investigated for recession coverage. This case report evaluates the usefulness of CAF + EMD as a root coverage procedure in Miller’s Class I or II gingival recession and showed successful root coverage at 6 months.

Keywords: EMD, CAF, Gingival Recession, Root Coverage

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**Introduction:** Gingival recession is defined as the displacement of the marginal tissue apical to the cement enamel junction (CEJ).\(^1\) Patients with gingival recession often complain about poor esthetics, thermal sensitivity, root caries and erosion. In recent years due to the increase esthetic demands of the patients, the treatment of recession becomes an important therapeutic issue for clinician. The exposure of root surfaces is multifactorial, including periodontal disease, faulty tooth brushing, iatrogenic factors like orthodontic movement, poor restorations and anatomical factors such as tooth malposition and frenum pull.\(^2\) Several techniques such as the free gingival graft, sub epithelial connective tissue graft (SECTG), semilunar flap, laterally positioned flap, coronally advanced flap (CAF), double papilla graft etc. have been proposed to access this problem.\(^3,4,5\) In spite of advancement in dentistry, treatment of gingival recession still creates the therapeutic dilemma for the clinician. Recently, acellular dermal matrix graft and enamel matrix derivative (EMD) also has been used as a substitute for root coverage procedures.\(^6\) In recent literature combination of EMD with a CAF has been investigated for recession coverage. This case report evaluates the usefulness of CAF + EMD as a root coverage procedure in Miller’s Class I or II gingival recession at 6 months.

**Materials & Method:** 2 patients with Miller’s class I & II were reported with a chief complain of sensitivity & unaesthetic appearance of tooth. (Fig 1A, 2A) Upon thorough examination adequate width of keratinized tissue apical to recession, no loss of radiographic interdental bone & no occlusal interferences were found. A thorough plaque control programme was initiated & instructions were given to modify tooth brushing technique. On surgical day the area was anesthetized using 2% lignocaine (with 1:50,000 epinephrine). An intrasulcular incision was given on the buccal aspect of the selected tooth with B.P blade No.12. Then 2 horizontal incisions in the interdental papillae at the level of CEJ on the mesial and distal side of the defect, extending to the adjacent teeth were performed.

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![Figure 1A: Pre-Operative gingival recession at tooth no. 14](image1)

![Figure 1B: Horizontal and Vertical incisions given](image2)

![Figure 1C: Split- Full- Split thickness flap reflected](image3)

![Figure 1D: 24% EDTA gel was Applied For Etching](image4)
Two apically directed vertical releasing incisions was given at the line angles of adjacent teeth extending beyond mucogingival junction (MGJ) into the alveolar mucosa (Fig. 1B). Initially a trapezoidal split thickness flap was elevated by sharp dissection which was then followed by full thickness flap reflection by periosteal elevator upto MGJ. Beyond MGJ the trapezoidal flap was again reflected as split thickness by sharp dissection leaving the underlying periosteum intact and extended as far as necessary to allow for flap advancement to the CEJ without tension (Fig. 1C). This necessitated a mesio-distal and apical extension of the partial thickness dissection in order to release any residual tension and allow a passive coronal displacement of the flap. The vestibular epithelium of the adjacent interdental papillae was removed. The exposed root surfaces were conditioned with a 24% EDTA gel for 2 minutes to remove the smear layer (Fig. 1D). Then the area was thoroughly rinsed with saline. The root surfaces were dried and EMD (Emdogain) was applied to the exposed root surfaces, starting at the base of the recession using the canula (Fig. 1E). Finally the flap was positioned slightly coronal to the CEJ and fixed with mattress.
suture. Vertical incisions were sutured with interrupted 4-0 nonabsorbable silk suture (Fig. 1F). Interrupted horizontal suspension suture was given to secure the CAF. The periodontal dressing was then placed and removed along with sutures after 2 week.\(^{(1-G,H)}\) 6 months post-operative both the patients showed excellent clinical result with complete coverage of exposed area, excellent tissue architecture which meets their complaints. (Fig. 1I, 2B)

**Discussion:** CAF appears to be less technique sensitive and have a high degree of success with appropriate case selection and preparation. Allen and Miller reported 97% mean root coverage and complete root coverage achieved in 84% of the sites.\(^{(5)}\) Although the use of SECTG is considered as, “Gold Standard” treatment for root coverage procedures it produces 2\(^{nd}\) surgical site & may create surgical complications.\(^{(7)}\) Recently a commercially available & FDA approved enamel matrix derivative (Emdogain\(^{®}\); Straumann, Switzerland) which is a purified acidic extract of developing embryonal enamel derived from six month old piglets is showing promising regenerative potential.\(^{(8)}\) It act as a tissue-healing modulator that stimulate periodontal regeneration.\(^{(9)}\) The major fraction of the enamel matrix proteins is composed of amelogenins, that account for more than 90% of the organic constituents of the enamel matrix. The second largest component of the enamel matrix protein is the enamelines. A number of researches have studied the mechanism of actions of EMD & the clinical therapeutic potential of this device. Some clinical studies demonstrated that CAF+CTG and CAF+EMD procedures shows similar results.\(^{(7,10)}\) Therefore it should be considered that the CAF+EMD approach produces real benefit in terms of patient comfort resulting from the absence of a donor site, early healing and the ease of the surgical procedure. Other have achieved significant root coverage with the CAF+EMD procedure in controlled studies.\(^{(7,11)}\)

**Conclusion:** EMD seems to be a promising material for root coverage procedure, long term evaluation of studies with large sample size will provide a clear view of ultimate result.

**Conflict of Interest:** Nil

**References:**


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