



## Research article

# Multidisciplinary Approach for the Management of Localized Gingival Recession with Endodontic Lesion in Aesthetic Zone: A Case Report

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## Abstract.

**Background:** Gingival recession can cause esthetic problems, especially if it occurs in the maxillary anterior region. Gingival recession accompanied by endodontic complications requires a multidisciplinary approach to achieve successful therapy.

**Objective:** To report the treatment of Miller's class-III gingival recession using laterally stretched flap + connective tissue graft with frenotomy and apicoectomy in one visit.

**Case Report:** A healthy 24-year-old man presented with chief complaints of open and painful gums on his left upper front tooth. After objective and radiographic examinations, the diagnosis of tooth 21 was Miller's class-III gingival recession, that is, plaque and calculus with endo-perio lesions and grade 1 luxation. The treatment given included scaling, root planning, curettage, retreatment of root canal and root coverage therapy with frenotomy and apicoectomy.

**Results:** The results obtained were partial root coverage of 71.4% and an increase in the thickness of keratinized tissue.

**Conclusion:** Healing of periodontal tissue damage accompanied by endodontic lesions showed success and obtained stable treatment results with a multidisciplinary approach.

**Keywords:** Miller's class-III gingival recession, endodontic lesion, laterally stretched flap, apicoectomy

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## 1. Introduction

Gingival recession is the apical movement of the gingival margin with the cemento-enamel junction as a landmark and causes pathological exposure of the tooth root [1]. Gingival recession can cause esthetic problems especially if it occurs in the maxillary anterior region [2]. The etiology of gingival recession is multifactorial, including plaque-induced inflammation, iatrogenic factors due to restorations, toothbrush trauma,

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tooth malposition, high frenum attachment, inappropriate periodontal treatment, chronic trauma, and excessive movement of orthodontic appliances [2][ 3].

Various techniques have been reported for the management of gingival recession. The goal of recession therapy is to close the exposed tooth root with good esthetics and obtain a thick biotype in order to achieve long-term stability [4]. In the literature, gingival recession is classified into 4 classes based on the prognosis of root coverage. In Miller class I and II, there is no interproximal bone loss and complete root coverage can be achieved; in class III, there is mild to moderate interproximal bone damage and partial root coverage can be achieved; whereas in class IV, there is severe interproximal bone loss so that root coverage cannot be achieved [5]. It is not uncommon for perio cases to be aggravated by endodontic complications that can worsen the prognosis. Root canal treatment is the first treatment required for teeth with endo-perio lesions [6].

The purpose of this case report is to describe the clinical success of an extremely compromised maxillary central incisor with severe mucogingival deformity associated with a periapical process treated with laterally stretched (LAST) flap + connective tissue graft (CTG) with frenotomy and apicoectomy.

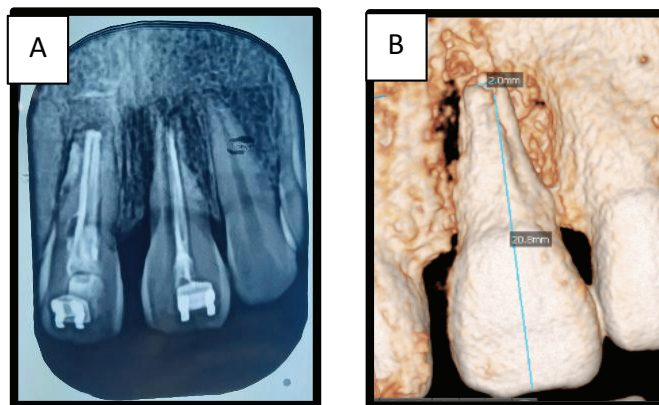
## 2. Case Report

A healthy 24 years old man came to the Periodontics clinic of RSGM UGM Prof. Soedomo with chief complaints that the gums on the upper left front tooth was open and often feel sore (Figure 1). The tooth had fallen out in an accident 16 years ago and was then root canal treated and re-attached.

The objective examination, it was found that Miller's class III gingival recession was found on tooth 21 with a pocket depth of 8 mm accompanied by bleeding on probing in the apical area, palpation +, percussion +, grade 1 luxation, and moderate of oral hygiene index. Recession height was 6 mm, recession width was 5mm, with attachment loss was 14mm. There is no keratinized tissue at the apical of the recession tooth but adjacent teeth have keratinized tissue. Edema was seen at the gingival margin of tooth 21. The superior labial frenum attachment was high with a blanch test + and there was a central diastema. The patient refused orthodontic treatment to correct the central diastema. On radiographic examination of tooth 21, root canal treatment was performed but the obturation was not hermetic and there was resorption of the root tip (Figure 2). The diagnosis of tooth 21 was Miller class III gingival recession e.c. plaque and calculus with endo-perio lesions and grade 1 luxation.



**Figure 1:** Clinical appearance of gingival recession of tooth 21.



**Figure 2:** (A) Periapical x-ray of tooth 21 and (B) Cone-beam computed tomography of tooth 21.

Based on the examination that has been done, multidisciplinary treatment between periodontics and endodontics is needed. The patient agree to the treatment plan that will be carried out and has signed the informed consent and also consented to his case being published.

In the initial phase therapy, scaling, root planing, and polishing and curettage were performed. The curettage was performed to relieve edema of the gingiva of tooth 21. After local anesthesia, subgingival scaling was performed to remove plaque, calculus, and cementum on the root surface using an ultrasonic scaler. Subsequently, curettage was performed using gracey curettage to remove granulation tissue on the pocket wall and smooth the root surface and then irrigated with saline solution. Subsequently, metronidazole gel and periodontal dressing were applied. Postoperative instructions

include amoxicillin 500 mg every 8 hours for 5 days and mefenamic acid 500 mg if necessary. One week after curettage showed that the recession height was 7mm, the width of the recession was 5mm with a pocket depth of 5mm in the apical area and there was no visible edema at the gingival margin of tooth 21.



**Figure 3:** One week after curettage.

Starting the corrective phase, the patient was referred to the Conservation clinic for retreatment of root canal on tooth 21. Tooth isolation was performed with a rubber dam and open access was done. Gutta percha was removed using H File and xylo solution. After the root canal was cleared of gutta-percha, the root canal was disinfected using  $\text{CaOH}_2$  and temporarily filled. Two weeks after root canal cleaning, there were no complaints from the patient. Subsequently, the root canal was filled with Mineral Trioxide Aggregate (MTA) BIODENTIN® using a micro apical placement (MAP) device, then moistened cotton was applied to assist the MTA setting, temporarily placed and evaluated using an X-ray (Figure 4). Because the root canal was constantly moistened by the gingival crevicular fluid entering through the open foramen, one-third apical of the MTA appeared to be less densely filled, so an apicoectomy and apical (retrograde) filling of the MTA was performed concurrently with root coverage treatment.

The patient was brought back after 1 week after filling the MTA for joint care in the form of root coverage using laterally stretched flap + connective tissue graft by Perio and apicoectomy by Conservation. Intracoronary splinting using wire and composite was performed before the surgery.



**Figure 4:** Periapical after MTA filled.

After local anesthesia, a full thickness flap was opened at the apical gingival margin of tooth 21 using an epbuser to reveal the root tip. Subsequently, an apicoectomy was performed by making a 45° labial bevel using a flat end fissure bur and smoothed using a round bur, then the root canal was irrigated using saline and dried using a paper point, then MTA was applied using MAP and condensed using a condenser (Figure 5).



**Figure 5:** Apicoectomy: (A) gingival retraction; (B) 45°bevel; (C) MTA filling.

After the apicoectomy was completed, it was continued with root coverage therapy. An intrasulcular incision was made on the lateral gingival margin of the recession tooth using a microblade (Figure 6) and then a partial thickness flap was opened using a tunneling instrument (Figure 7). A horizontal incision was made apical to the interdental papilla using a #15c blade and papilla preservation was performed (Figure 8). This area will be used as a bedside. Then root planing was performed on the denuded roots using

a Gracey curette (Figure 9) and conditioning using EDTA gel for 2 minutes then rinsed with distilled water (Figure 10).



**Figure 6:** Intrasulcular incision.



**Figure 7:** Partial thickness flap.

Connective tissue grafts were harvested from the palate using the de epithelialized connective tissue graft technique and the donor area was closed with collagen membrane and fixed with cross sutures using nylon #4-0 thread (Figure 11). The CTG placed on the bedside and fixed with cross sutures using absorbable monofit #5-0 suture, then flap was pulled from the lateral covering the CTG and the flap was fixed using nonabsorbable nylon #5-0 thread with interrupted sutured starting from the most apically in a coronal direction, but there was a 2 mm CTG that was not covered by the flap (Figure 12). A laterally retracted flap is also intended for frenotomy.



**Figure 8:** Horizontal insision.



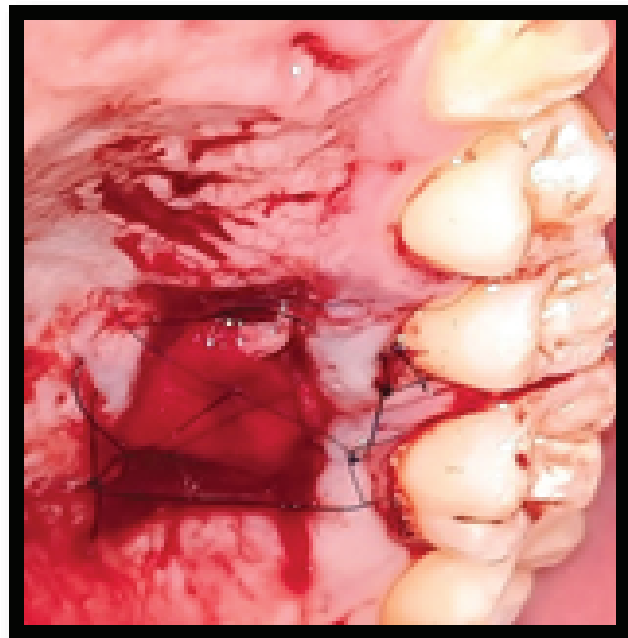
**Figure 9:** Root planing.

Postoperative instructions included amoxicillin 500 mg every 8 hours for 5 days, mefenamic acid 500 mg if necessary, and chlorhexidine 0.2% mouthwash twice daily. The sutures were removed at 2 weeks post op. Controls were carried out in the first week, 2nd week, 5th week, and 8th week.

The healing occurs in both the donor and recipient areas. There were no complaints and no postoperative complications. At 2 weeks postoperatively, the CTG that was not covered by the flap was necrotic. At 8 weeks postoperatively, the root coverage achieved was 71.4% with the recession height being 2mm, the recession width was 5mm, and the keratinized tissue being 5mm (Figure 13). The radiographic examination



**Figure 10:** EDTA gel application.



**Figure 11:** Collagen membrane at donor side.

revealed a hermetic obturation (Fig. 14). The patients was satisfied with the results achieved.

### 3. Discussion

The success of the root coverage procedure depends on several things, including the elimination and control of etiologic factors, interproximal bone level, and the selection





**Figure 12:** After surgery.



**Figure 13:** Eight weeks after root coverage.

of root coverage techniques based on the case [7]. The curettage performed at initial phase aims to prepare the tissue for surgery. After curettage, there was a decrease in pocket depth. Treatment of deep gingival recession, accompanied by the absence of keratinized tissue, remains a challenge for the clinician. The laterally stretched flap technique has shown promising results as a better alternative for cases of deep gingival recession [8]. This report describes the use of CTG closed by a flap from the lateral direction by stretching the surrounding tissue without a vertical incision, aiming to



**Figure 14:** Periapikal at eight weeks after apicoectomy.

minimize open CTG, increase wound revascularization, and improve aesthetic results [9]. However, in this case, the gingival biotype was thin so that the operator had difficulty in making the partial thickness flap and when pulling the flap from the lateral direction to cover the CTG so that the CTG tissue was exposed and necrotic at 2 weeks postoperatively. This is what causes the recession not to be completely covered. The use of CTG can increase the width of keratinized tissue so that stable results will be achieved in the long term [10]. The selection of monofilament absorbable sutures for CTG fixation is recommended so as not to require second surgery for suture removal [11]. The use of nylon #5-0 which is a non-absorbable monofilament is recommended because it has been shown to have lower bacteria adhesion and in addition, its small size can minimize tissue trauma [12][13].

The endodontic lesion in this case was probably caused by the avulsion of the tooth several years ago. Complications of avulsed teeth can occur after several months or even years, namely root tip resorption and if it persists a periradicular abscess can appear which can increase tooth mobility [14]. In this case, retreatment of root canal was carried out and then disinfected using  $\text{CaOH}_2$  for 2 weeks to remove *E faecalis* bacteria,

which is the dominant bacterium in root canals [15]. MTA was chosen as a root canal filling material because it has biocompatibility, bioactivity, hydrophilicity, radioopacity, low solubility, has the ability to form layers such as hydroxyapatite when in contact with physiological fluids, has good sealing ability, and can encourage regeneration of the periodontal ligament, bone and cementum [16]. Several factors that need to be considered before performing apicoectomy (root end resection) are: instrumentation, extent of resection and angle of resection. In this case, a 45° bevel is made to increase visibility of the resected root-end, increasing operator accessibility [17,18].

## 4. Conclusion

Healing of periodontal tissue damage accompanied by endodontic lesions has shown success with a multidisciplinary approach to achieve clinical stability. The laterally stretched flap technique with connective tissue graft with frenotomy and apicoectomy can be performed in one visit and has a good impact on the treatment of recession with involvement of endodontic lesions.

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