



## Case Report

# Management of multiple RT2 gingival recession through coronally advanced flap technique: A report of two cases

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## Abstract

Managing multiple adjacent gingival recessions in visually prominent areas requires a surgical approach that not only addresses all affected sites but also preserves the integrity of the surrounding soft tissues. This case series demonstrates the effectiveness of a multiple coronally advanced flap technique, integrated with the envelope approach, in treating multiple recession defects in a patient with high esthetic expectations. The procedure resulted in both functional and esthetic improvements, successfully restoring gingival architecture and improving the visual harmony of the treated region.

**Keywords:** Gingival recession, Coronally advanced flap, Esthetic periodontal procedure, Soft tissue management.

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## 1. Introduction

Gingival recession is a common mucogingival condition characterized by the apical migration of the gingival margin beyond the cemento-enamel junction (CEJ), leading to root surface exposure.<sup>1</sup> It may present as an isolated defect or involve multiple adjacent teeth, often raising concerns related to esthetics, dentinal hypersensitivity, root surface caries, and potential periodontal attachment loss.<sup>2,3</sup> Epidemiological studies indicate that the prevalence of gingival recession increases with advancing age and is modulated by factors such as oral hygiene practices, brushing technique, anatomical characteristics, and systemic health conditions. The etiology is multifactorial, with contributing factors including microbial plaque accumulation, traumatic toothbrushing, periodontal disease, malpositioned teeth, occlusal trauma, alveolar bone dehiscence, and lifestyle habits such as smoking.<sup>4</sup> Proper classification of gingival

recession is critical for effective treatment planning. The classification proposed by Cairo in 2011 is widely used in clinical practice and distinguishes recession defects into three categories: RT1 (no interproximal attachment loss), RT2 (interproximal loss equal to or less than buccal loss), and RT3 (interproximal loss greater than buccal loss).<sup>5</sup> The condition of interproximal soft tissues is a key determinant of the predictability of root coverage outcomes. In situations where esthetic demands are high and interproximal tissues remain intact, the coronally advanced flap (CAF) technique is often the method of choice. This approach enables the repositioning of the gingival margin without requiring grafts, thereby preserving the natural gingival architecture, including color, thickness, and texture, which is particularly advantageous in anterior regions.<sup>6</sup> Zucchelli et al. introduced a refined CAF technique specifically designed to treat multiple adjacent gingival recessions without employing vertical releasing incisions. This modification minimizes the

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risk of post-surgical scarring and helps preserve the lateral blood supply to the flap.<sup>7</sup> However, vertical incisions may be beneficial in selected cases to improve flap mobility and optimize clinical outcomes. The present case report describes the application of a multiple coronally advanced flap technique for the treatment of multiple adjacent recession defects, demonstrating satisfactory clinical and esthetic results.

## 2. Case Management

Initial periodontal therapy included detailed oral hygiene instructions and thorough scaling to eliminate local contributing factors. Under local anesthesia, a multiple CAF procedure was performed. The surgical approach involved a combination of full-thickness and partial-thickness flap elevations to facilitate tension-free coronal advancement. The flap was carefully positioned to cover the exposed root surfaces and secured using sutures. A periodontal dressing was applied to protect the surgical site. Postoperative care included the administration of analgesics and a 0.12% chlorhexidine mouth rinse to promote healing and reduce microbial load. The patient was scheduled for regular follow-up appointments for postoperative evaluation and timely suture removal.

### 2.1. Case 1

A 30-year-old male patient visited the Department of Periodontology at the Postgraduate Institute of Dental Sciences, Rohtak, and reporting sensitivity to cold in the maxillary anterior region. The patient was, systemically, healthy, with no significant parafunctional habit history. Clinical evaluation revealed RT2 gingival recession on teeth #11, #12, #13, #21, #22, and #23. The recession depth averaged around 2 mm, accompanied by 2–3 mm of clinical attachment loss (**Figure 1 a, b**). The initial phase of treatment included non-surgical periodontal therapy, which involved meticulous scaling and root planning. Oral hygiene instructions were reinforced during follow-up visits to ensure proper plaque control. Once optimal hygiene was maintained, a surgical procedure was planned to address the recession defects. A multiple coronally advanced flap (CAF), adapted from Zucchelli's technique, and was selected for surgical management. To ensure adequate flap mobility and allow for tension-free repositioning, vertical incisions were placed at the mesial line angles of teeth #11 and #23—the boundary teeth of the surgical area (**Figure 1 c**). After administering local anesthesia (2% lignocaine with epinephrine), a horizontal incision was extended to include one tooth beyond the recession area on either side. Oblique submarginal incisions were created in the interdental papillae,

transitioning into intrasulcular incisions at the recession sites. The flap was elevated in a coronal-to-apical direction using a split–full–split thickness approach. Initially, a split-thickness dissection was performed in the interdental areas to conserve the papillae. This was followed by a full-thickness reflection over the root surfaces to increase flap thickness for better root coverage (**Figure 1 d**). The apical region was again treated with a split-thickness dissection to allow for greater coronal advancement. Root surfaces were gently cleaned with hand instruments, taking care to prevent trauma, especially in areas with thin bone or dehiscence. The interdental papillae were de-epithelialized to support integration of the repositioned flap and improve vascular contact. The flap was advanced coronally and secured with 5-0 Vicryl interrupted sutures, ensuring a passive fit over the exposed roots (**Figure 1 e**). Postoperative care involved instructing the patient to rinse with 0.12% chlorhexidine twice daily and to avoid brushing in the treated region. Medications included amoxicillin 500 mg three times daily and ibuprofen 400 mg twice daily for three days. Sutures were removed after two weeks (**Figure 1 f**), and clinical inspection showed favorable healing with full root coverage.



**Figure 1:** (a): Pre-operative view of gingival recession; (b): Measurement showing 2 mm depth and 3 mm width of recession; (c): Submarginal oblique incision made in the interdental papilla (d) Split–full–split thickness flap elevation technique; (e): Flap coronally repositioned and stabilized with sutures; (f): Clinical healing observed at the 2-week follow-up; (g, h): One-year postoperative views demonstrating stable gingival margins and root coverage.

## 2.2. Case 2

A 32-year-old male reported experiencing cold sensitivity in the upper front teeth. Clinical examination identified RT2 gingival recession on teeth #11, #12, and #13, with recession depths of approximately 2 mm clinical attachment loss (**Figure 2 a, b**). The patient was systemically healthy and demonstrated good oral hygiene practices. After completing non-surgical periodontal therapy and reinforcing oral care instructions, a surgical intervention using a multiple coronally advanced flap (CAF), inspired by Zucchelli's technique, was planned. To define the operative area, vertical releasing incisions were made at the mesial line angles of teeth #11 and #13. A split–full–split thickness flap elevation was performed: split-thickness dissection was used interdentally to preserve papillary tissue, full-thickness over the exposed root surfaces to increase flap thickness and improve adaptation, and split-thickness in the apical portion to allow tension-free coronal positioning (**Figure 2 c**). Gentle root debridement was performed to prepare the root surfaces,

and interdental papillae were de-epithelialized to facilitate flap integration and vascularization. The flap was then coronally repositioned and stabilised with sutures to ensure full root coverage (**Figure 2 d**).

## 3. Results

In Case 1, baseline measurements showed an average gingival recession depth of 2 mm and a recession width of around 3 mm for each involved site. Following surgical intervention, these values decreased to approximately 0.5 mm, reflecting a mean root coverage of 1.5 mm. Additionally, there was a gain of nearly 1 mm in the width of keratinized gingiva (**Figure 2 g, h**). In Case 2, the initial recession depth and width were 2 mm and 2.5 mm, respectively. Postoperative evaluation indicated a reduction to about 0.5 mm in both parameters, also achieving an average root coverage of 1.5 mm and an increase of 1 mm in keratinized tissue width. Both cases demonstrated well-maintained gingival margins and enhanced esthetics at the one-year follow-up (**Figure 2 e**).



**Figure 2:** (a): Pre-operative clinical view showing gingival recession (b): Measurement indicating 2 mm recession depth and 3 mm recession width; (c): Surgical view demonstrating the split–full–split thickness flap technique; (d): Flap coronally repositioned and stabilized with sutures; (e): One-year postoperative view showing stable root coverage and healthy gingival margin.

#### 4. Discussion

The increasing emphasis on cosmetic dental care has brought renewed focus to the management of gingival recession, particularly in the upper anterior region, where even minimal root exposure can significantly affect smile esthetics and patient satisfaction.<sup>8</sup> The primary objective in such cases is to reposition the gingival margin to the level of the cemento-enamel junction (CEJ) while ensuring tissue harmony and functional integrity.<sup>9</sup> When multiple adjacent teeth are affected, treating all recession sites simultaneously improves esthetic consistency and reduces patient discomfort and chair time.<sup>10</sup> The coronally advanced flap (CAF) is widely accepted for predictable root coverage outcomes, but the present study introduces a multiple CAF approach featuring two clinically significant innovations: a split–full–split thickness flap design and selective vertical releasing incisions placed at boundary teeth. These alterations were made to overcome anatomical limitations like shallow vestibules or high frenal, which can restrict flap mobility, and to improve tissue adaptation without compromising vascular supply. Initial split-thickness dissection in interdental areas helps conserve papillary structure critical for esthetic outcomes.<sup>11</sup> Full-thickness elevation over the root surfaces enhances flap thickness and stability, while apical split-thickness dissection improves coronal advancement. This method allows for tension-free repositioning without requiring connective tissue grafts, making it less invasive and more adaptable to clinical variability. In the two cases presented, both involving multiple adjacent maxillary anterior teeth with RT2 gingival recession, the CAF technique achieved approximately 70% root coverage at one-year follow-up, with stable gingival margins and increased keratinized tissue, demonstrating consistent clinical and esthetic success. These outcomes compare favourably to the results reported by Tavelli et al. who demonstrated a mean root coverage (MRC) of 86.7% and complete root coverage (CRC) of 68.4% in multiple recession defects treated with a modified CAF.<sup>12</sup> Similarly, Cairo et al. found significantly higher esthetic scores and keratinized tissue gains with MCAF compared to conventional CAF ( $p < 0.05$ ),<sup>13</sup> while Zucchelli et al. reported that vertical incisions in CAF enhanced flap thickness and positional stability in challenging anatomical sites ( $p = 0.02$ ). Furthermore, Hwang et al. emphasised that tailored flap designs combining partial- and full-thickness dissection significantly improved vascularity and long-term root coverage outcomes.<sup>14</sup> Compared to alternative minimally invasive procedures such as the tunnel technique and vestibular incision subperiosteal tunnel access (VISTA), which often require connective tissue

grafts and advanced surgical skills, the multiple CAF applied here achieved comparable or superior outcomes (66–100% root coverage) with less postoperative discomfort and excellent esthetic integration. These findings support the multiple CAF as a biologically sound, technically versatile, and esthetically favourable approach, especially for patients presenting high smile lines, intact interdental tissues, and site-specific anatomical challenges.

#### 5. Conclusion

This case series demonstrates that the adapted coronally advanced flap approach is effective in treating multiple adjacent gingival recessions, particularly in patients with heightened esthetic concerns. The surgical design, incorporating vertical incisions and a combination of split and full-thickness flap techniques, allowed for tension-free repositioning of the gingiva. As a result, consistent root coverage was achieved along with improvements in gingival contour and an increase in keratinized tissue. These clinical outcomes not only support periodontal health but also enhance esthetic appearance and patient satisfaction over time.

#### 6. Source of Funding

None.

#### 7. Conflict of Interest

None.

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