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This case report proposes a unique approach for managing Cairo gingival recession types 1 and 2 (RT1 and RT2, respectively) in the mandibular anterior region, where anatomical features such as a high frenal attachment or a shallow vestibule preclude the use of a coronally advanced flap. Three systemically healthy patients presenting with Cairo RT1 and RT2 gingival recessions were included. The recessions were managed with a staged approach of frenectomy followed by a modified tunnel in combination with connective tissue graft. Significant root coverage was achieved in all three cases. This treatment approach allows for root coverage, relief of frenal pull, keratinized tissue gain, and increased vestibular depth in very challenging Cairo RT1 and RT2 gingival recessions in mandibular anterior teeth. A short-term follow-up of 3 to 6 months showed stable results in all presented cases. Int J Periodontics Restorative Dent 2022;42:e193–e198. doi: 10.11607/prd.5791

Gingival recession is defined as the exposure of the root surface following apical displacement of the gingival margin. Several factors have been associated with recession development, including periodontal disease, tooth malposition, alveolar bone dehiscence, high frenal attachment, traumatic tooth brushing, occlusal trauma, and orthodontic treatment. Mucogingival surgeries for the management of gingival recessions are not only indicated for improving esthetics, but also for thickening the gingival phenotype and gaining keratinized tissue (KT), thereby facilitating plaque control and periodontal maintenance.

Different techniques for root coverage have been introduced through the years, showing varying degrees of success. However, the coronally advanced flap (CAF) in combination with connective tissue graft (CTG) remains the gold standard. One way to achieve coronal advancement is by creating a passive tunnel, as explained by Raetzke. This technique has evolved over the years and has been used in combination with different graft materials. It has gained wide popularity and acceptance, primarily due to inherent advantages such as greater blood supply, faster healing, reduced postoperative morbidity subsequent to limited flap reflection, and improved esthetics.

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Recently, the 2-year follow-up of a randomized clinical trial showed that a tunneling approach accompanied by CTG can exhibit esthetic and root coverage results in Miller Class I or II recessions that are similar to the gold standard approach of CAF with CTG. Furthermore, several modifications of the tunnel approach have been proposed, such as the coronally advanced tunnel or the laterally closed tunnel, which have both been suggested as viable options for predictable root coverage in isolated mandibular anterior recessions.

Even though root coverage procedures have greatly evolved, a severe single mandibular anterior Miller Class II or III recession—which would be classified as Cairo recession types 1 or 2 (RT1 and RT2, respectively)—remains a challenging area to treat due to anatomical factors like shallow vestibular depth and high frenal attachment. Furthermore, in the mandibular region, a partial-thickness flap might be difficult to perform and bears the increased probability of flap perforation due to reduced gingival thickness. To reduce this potential complication, a modification of the tunnel procedure, the modified coronally advanced tunnel (MCAT) was recently introduced. However, passive displacement of the flap may be difficult in MCAT as well, especially in sites with high frenal attachments. In order to overcome the above-mentioned challenges, a staged approach of frenectomy followed by tunnel in combination with CTG is described in the present cases. This approach aims to laterally approximate the gingival margins of the prepared tunnel in a tension-free manner and to maintain an exposed part of the CTG.

Case Presentations

Three systemically healthy patients, ages 25 to 32 years old, who had undergone or were undergoing orthodontic treatment presented in the University of Connecticut Graduate Periodontology Clinic. Clinical examinations revealed gingival recessions that were categorized as Cairo RT1 and RT2, with a shallow vestibular depth and high frenal attachment. After obtaining oral and written informed consent from the patients, treatment was rendered to them between 2017 and 2019. Prior to surgery, supra-gingival plaque removal was completed and oral hygiene instructions were given. Patients exhibited an adequate level of compliance at reevaluation, with Plaque Indices of 0 to 1, bleeding on probing < 10%, and probing depths ranging from 2 to 3 mm.

In all three of the present cases, an aberrant frenum was present and contributed to the progressing recession. Thus, frenectomy was performed to relieve the aberrant frenal pull. The surgical site was left to heal for 4 to 6 weeks, and thereafter a modified tunnel in combination with CTG was performed to achieve root coverage and increase the KT and vestibular depth.

After local anesthesia, root planing of the exposed root surface was performed with Gracey curettes. Subsequently, intrasulcular incisions were made on the tooth presenting the recession and were extended to one adjacent tooth on each side using microsurgical blades. The tunnel preparation was a combination of full-thickness flap on the coronal aspect followed by a split-thickness flap on the apical aspect; it was completed with the use of specially designed tunneling instruments. A CTG was harvested either by using a single-incision approach from the palate or using a deepithelized free CTG technique.

Using nonresorbable monofilament sutures (such as nylon or polypropylene) and an internal mattress technique, the CTG was secured mesially and distally inside the tunnel. The graft was adapted to the cementoenamel junction by means of a sling suture, using the tooth as a fulcrum, independent of the overlying flap. Finally, the margins of the pouch were secured passively over the graft and sutured with interrupted sutures to accomplish tension-free partial coverage. No attempt was made to achieve complete closure of the tunnel over the graft.

Postsurgically, all patients were prescribed analgesics (ibuprofen 600 mg tid for 5 days) and antibiotics (500 mg amoxicillin tid for 7 days). Each patient was specifically instructed to refrain from brushing the surgical sites for 4 weeks postoperatively and was advised to use a 0.12% chlorhexidine mouthrinse twice a day for 2 weeks postsurgery. Patients attended follow-ups at 1, 2, and 4 weeks postoperative
for supragingival scaling. The sutures at the recession site were removed at 2 weeks postoperative.

In all cases, healing was uneventful and without complications. At the initial follow-up appointments after the frenectomy was performed, the high frenal attachment was eliminated and the vestibular depth at the sites had increased markedly. After the tunnel and CTG sites had healed, all sites presented with optimal root coverage that remained stable through the short-term follow-up, and increased thickness of the surrounding gingival tissue and KT width were also seen. Figures 1 to 3 show the surgical procedures and follow-ups for all three cases.

Discussion

The present case series revealed optimal root coverage (95% to 100%) with stable gingival margins over a short-term follow-up. The results achieved in all cases show the potential of this staged approach in the management of deep mandibular recessions where coronal flap advancement might be challenging and when a high frenal pull is present.

The technique proposed in the present case series is a frenectomy followed by a bilaminar approach of laterally closed tunnel
The emphasis and the uniqueness of this method is the staged treatment approach and the fact that there is no intent to completely approximate the sides of the tunnel, leaving part of the graft exposed. This might create concerns for clinicians who may fear the vitality and survival of the exposed connective tissue. However, the survival of the exposed portion of CTG is possible if there is a minimum ratio of 11:1 between the covered and uncovered areas. In the proposed approach, the graft gets its vascular supply from the periosteum, and only a minimal portion of it is left exposed. Besides, all selected cases had severe recessions with little to no vestibular depth. The frenectomy that was done prior to the tunnel and CTG treatment provided vestibular depth, KT from secondary healing, and tissue thickness for better handling. Scarring from the frenectomy can pose issues with tunneling, but careful manipulation of the tissue can overcome this. Finally, because it is not

Fig 2  Case 2. (a) Preoperative view of a Miller Class II or Cairo RT1 recession on the facial aspect of a mandibular right central incisor. (b) A frenectomy was performed with electrocautery methods. (c) Clinical view 4 weeks after the frenectomy. (d) A CTG was harvested by the deepithelialized free CTG approach. (e) The graft was placed in the tunnel and stabilized at the mesial and distal ends using 6/0 nylon sutures, and the mesiodistal approximation of the tunnel was completed using interrupted 5-0 polypropylene sutures. (f) Clinical view at 3 months postoperative. Optimal root coverage was achieved, and the previously thin gingival tissue had thickened.

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intended to coronally advance the flap or obtain lateral primary closure, the scarring did not affect the outcome of the surgery.

In the present case series, the selected cases were single anterior mandibular recessions, which are challenging to manage.19 There are different surgical approaches that can be used to achieve root coverage in this area, such as a lateral pedicle graft in combination with CTG, coronally advanced flap with CTG or a free gingival graft, or a laterally closed tunnel with CTG. All the above are viable options to be used. However, in the lateral pedicle graft approach, the clinician is always dependent on the gingival thickness of the donor sites.20 A coronally advanced flap in combination with CTG has been established as the gold standard for recession coverage, but it has been noted that its use in the anterior mandibular region with deep recessions can be challenging, and as a result, complete root coverage may only be achieved in 48% of cases.19 The free gingival graft can eliminate the

Fig 3 Case 3. (a) Preoperative view of a Miller Class III or Cairo RT2 recession on the facial aspect of a mandibular left central incisor. (b) A frenectomy performed using a 15 blade. (c) Clinical view 4 weeks after the frenectomy. (d) A CTG harvested with the single-incision approach. (e) The graft was placed in the tunnel and stabilized at the mesial and distal ends, and the mesiodistal approximation of the tunnel was completed using interrupted 6-0 nylon sutures. (f) Clinical view at 3 months postoperative. Optimal root coverage was achieved.
frenal attachment and increase the KT width and gingival tissue thickness, but it may not result in a significant amount of root coverage.¹⁺⁻¹⁴ Lastly, a recently introduced laterally closed tunnel approach may pose challenges with complete approximation of the tunnel margins.²¹

Conclusions

It can be concluded that within the limitations of this case series, the proposed technique is promising for the management of deep mandibular anterior Cairo RT1 and RT2 gingival recessions, as it provides optimal root coverage and esthetic results. However, a randomized clinical trial is needed to validate this approach and explore the clinical predictability and relevance of this technique.

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References