

CASE REPORT

Treatment of Recession Defects With Mucosal Access and Use of Soft Tissue Allograft: A Case Report of a Simplified Protocol

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Introduction: Esthetic and functional root coverage procedures using a variety of techniques and materials allow for predictable outcomes in Miller Class I and II defects, but may be accompanied by high levels of postoperative discomfort and lengthy intrasurgical time. Current techniques may also require a steep practitioner learning curve, cumbersome intrasurgical steps, and their use in challenging clinical situations, e.g. multiple adjacent recession defects, limited vestibular depth, and anatomical limitations can prove difficult. This report introduces the side access mucosal releasing incision (SAMRI) technique as an innovative and simplified method to perform mucosal-access root coverage procedures.

Case Presentation: A 42-year-old female presents with 3 to 4 mm of gingival recession at #9-11 and opts for treatment with a vestibular approach and acellular dermal matrix graft to avoid a secondary surgical site.

Conclusion: SAMRI procedure allows for optimal root coverage and esthetic results while limiting intrasurgical time and postoperative patient morbidity. *Clin Adv Periodontics* 2020;10:30–37.

Key Words: Acellular dermis; gingival recession; periodontal; surgery; therapy.

Background

Root coverage procedures using periodontal plastic surgical techniques have been employed to treat gingival recession defects around teeth and implants.^{1,2} These therapies are indicated to improve esthetics, dentinal hypersensitivity, progressive recession, inadequate keratinized tissues, and for the prevention of tooth structure loss through caries and non-caries cervical lesions (NCCLs).^{1–5} For these reasons, complete root coverage is the optimal outcome for root coverage procedures,^{5,6} but this outcome may be influenced by the initial defect dimensions,⁷

the surgical treatment modality,^{4–6} the postsurgical position of the gingival margin,⁸ and patient characteristics, such as smoking.⁹ Miller Class I and II¹⁰ defects have been shown to have a high success rate, with mean root coverage of 80.9% (50% to 97.3%) and complete root coverage achieved in 46.6% (7.7% to 91.6%) of cases.^{1,2,5}

In addition to individual recession defect morphology that may limit success of surgical treatment, the presence of multiple gingival recession defects also presents challenges. In these cases, a larger surgical field may result in a greater amount of anatomic variability and the size of the area to be treated may limit treatment options because of the quantity of autogenous donor tissue available for use.¹¹ Multiple techniques have been developed to obtain predictable root coverage in challenging clinical situations. The aim of these evolving techniques is to increase predictability of treatment, reduce patient morbidity and discomfort, minimize surgical visits, and improve esthetic success including color variability and continuity of the gingival margin.^{12,13} Distant incisions in the vestibule have been employed to improve access and patient treatment acceptance at multiple recession defects.^{13,14} This approach may allow for improved access with less risk of papillary displacement and better esthetic

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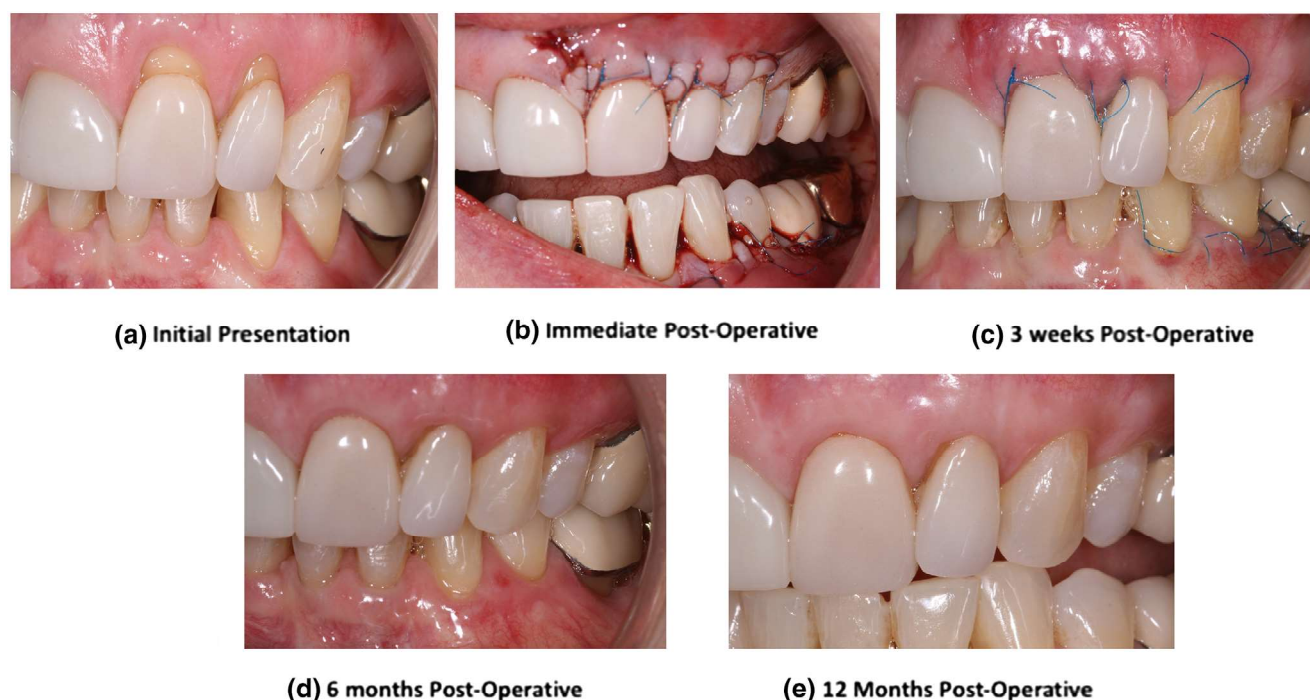


FIGURE 1 Presentation of 42-year-old female with gingival recession at #9-11 who opted to be treated with the SAMRI technique. Photographs demonstrate **1a** initial presentation of gingival recession defects, **1b** postoperative coronal advancement of tissues, and postoperative healing at **1c** 3 weeks, **1d** 6 months, and **1e** 12 months.

and patient-centered outcomes postoperatively.¹³ However, the vestibular incision subperiosteal tunnel access (VISTA) includes a cumbersome suturing technique and uses a resorbable collagen matrix, which may limit applicability in all clinical situations and requires increased surgical time.

The adjunctive use of growth factors in soft tissue grafting protocols has been employed to improve root coverage, gingival tissue quantity and quality, and postoperative patient comfort.^{6,15-17} The addition of growth factors has been shown to improve clinical outcomes with acellular dermal matrix (ADM) grafts and less predictable defects, such as Miller Class III gingival recession defects.¹⁷⁻¹⁹ Given the challenges to achieve optimal outcomes in challenging patients and recession defects and the limitations of soft tissue graft materials, the addition of growth factors when grafting in suboptimal clinical scenarios may be warranted.¹⁷

Clinical Presentation

A 42-year-old female presents with a chief complaint of “gum recession and sensitivity on the teeth on my upper front left.” Examination reveals 3 to 4 mm gingival recession defects at teeth #9-11 without radiographic interproximal bone loss or interproximal tissue loss. All recession defects in the upper left quadrant (ULQ) are classified as Miller Class I and II. The patient’s medical history is non-contributory and a comprehensive oral examination reveals no other dental or periodontal diagnoses. The patient has expressed concern about postoperative discomfort and postsurgical esthetics of the gingival graft

and states that she would prefer to avoid a secondary surgical site, if acceptable results can be achieved (Fig. 1).

Case Management

After initial examination and discussion of treatment options and risks and benefits of therapy, a mucosal incision approach to allow coronal advancement of the gingival flap and use of an allogeneic ADM graft^{||} was used to treat the recession defects in the ULQ. The patient provided verbal and written informed consent before any procedures were performed.

Recipient Site Preparation

Before surgical access, all exposed root surfaces were thoroughly scaled and root planed with hand and ultrasonic cures. A medialized vertical mucosal incision of 8 to 12 mm in length penetrating to the underlying bony tissue was made with a 15c blade extending from the mucosal tissue to the mucogingival junction (MGJ). This was performed to allow release at the teeth to be treated and 1 to 2 teeth medial and lateral (offset) to the treatment area. Full thickness mucoperiosteal elevation of a pouch from the incision to the gingival margins of affected teeth was prepared with a Molt Periosteal elevator. Elevation of the lateral extent of the recipient site was performed initially and the pouch then extended coronally and apically to allow for gingival margin mobility for coronal

^{||} Alloderm Regenerative Tissue Matrix; BioHorizons IPH, Inc. Birmingham, AL.

advancement of tissues. Interproximal papilla were then elevated using a 7/8 Younger-Good curette.

Graft Preparation and Insertion

ADM material was washed and hydrated per manufacturer's instructions and trimmed to cover the treatment area and one tooth lateral on each side. The length and thickness of the material should be adequate to allow for coronal advancement and increase in tissue thickness at the treatment site(s). The ADM graft was then inserted through the vertical incision and moved coronally and laterally into position. The graft and flap was positioned so that the gingival margin of the flap is concordant with the coronal edge of the graft and the flap and graft unit can be advanced together.

Suturing

ADM graft and overlying tissues were sutured using a sling suture. 6-0 polypropylene[†] sutures were used and the overlying tissue and graft pierced with the same pass in a bucco-lingual direction at each buccal line angle. Sutures were tied on the buccal and both graft and overlying tissue were coronally advanced and positioned at or above the cemento-enamel junction (CEJ). The graft was completely covered by the overlying tissues at the treatment site and the vertical access incision was closed using 5-0 chromic gut sutures.[‡]

Postoperative Management

The patient was postoperatively prescribed amoxicillin 875 mg bid or azithromycin 250 mg for 10 days postoperatively. The patient was also prescribed ibuprofen 800 mg tid for analgesia as needed, methylprednisone (Medrol dose pack) to be used as directed, and a topical antioxidant gel[#] applied twice daily until suture removal. Postoperative instructions included light activity restrictions for 72 hours postoperatively and avoidance of toothbrushing and interdental cleaning until suture removal at 6-weeks postoperatively. The patient was seen for postoperative visits at 3- and 6-week intervals and sutures were removed at the 6-week visit.

Surgical Approach

Schematic diagrams of the surgical approach include: initial presentation (Fig. 2), incision design (Fig. 3), flap dissection with Molt periosteal elevator (Fig. 4), papillary elevation (Figs. 5 and 6), ADM insertion (Figs. 7 and 8), ADM in position in the released pouch preparation (Fig. 9), suturing technique (Figs. 10 through 16), and final postoperative sutured surgical site (Fig. 17).

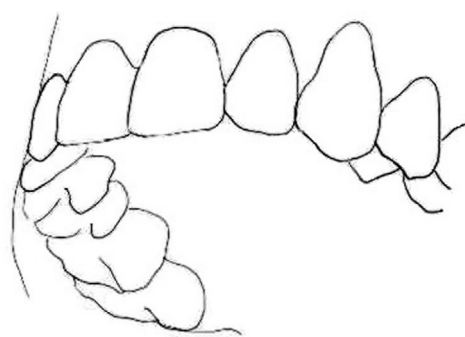


FIGURE 2 Schematic of initial presentation of a gingival recession defect at #11 to be treated with the SAMRI technique.

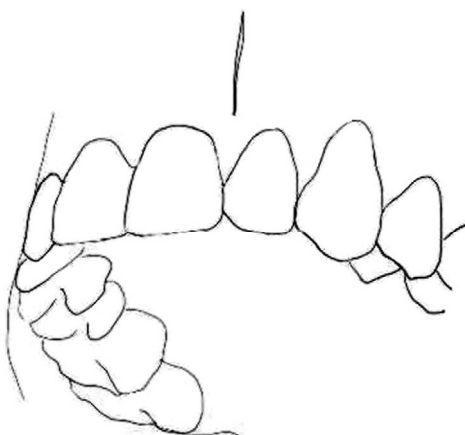


FIGURE 3 Schematic of the offset vertical vestibular access incision design for the SAMRI technique to address gingival recession at tooth #11.

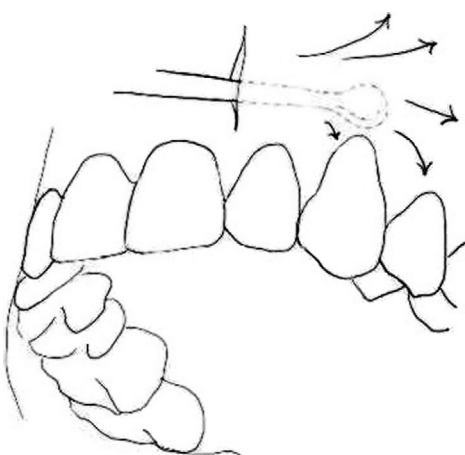


FIGURE 4 Schematic of subperiosteal flap dissection with Molt periosteal elevator to create graft recipient bed at teeth #10-12.

Clinical Outcomes

At 6-months posttreatment, complete root coverage of treated areas can be seen with intact and non-blunted papillae at the treatment site. Both practitioner (RC) and patient judged the esthetic result to be superior with a root coverage esthetic score (RES)²⁰ on all teeth treated

[†]SuriPoint Suture; Salvin Dental Specialties, Inc., Charlotte, NC.

[#]AO ProVantage; Periosciences; Dallas, TX.

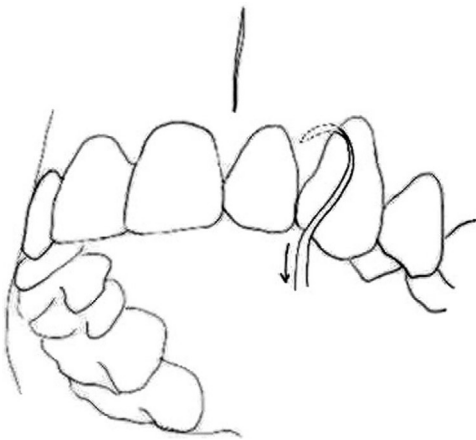


FIGURE 5 Schematic of papillary elevation with a 7/8 Younger-Good curette.

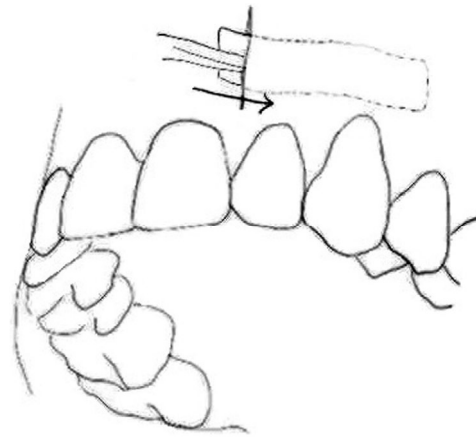


FIGURE 8 Schematic of ADM insertion through vestibular access incision.

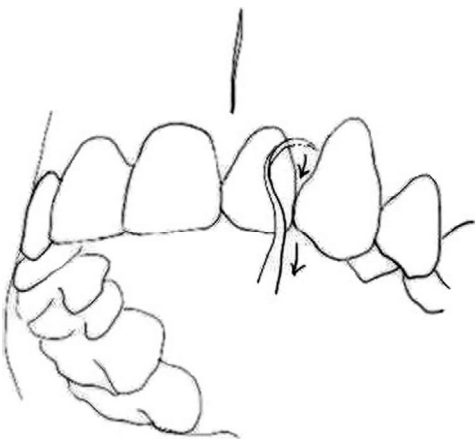


FIGURE 6 Schematic of papillary elevation with a 7/8 Younger-Good curette.

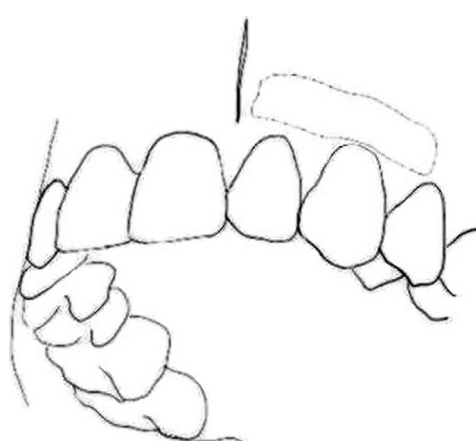


FIGURE 9 Schematic of ADM in position in the released pouch preparation prior to final coronal advancement of graft and flap with suturing.

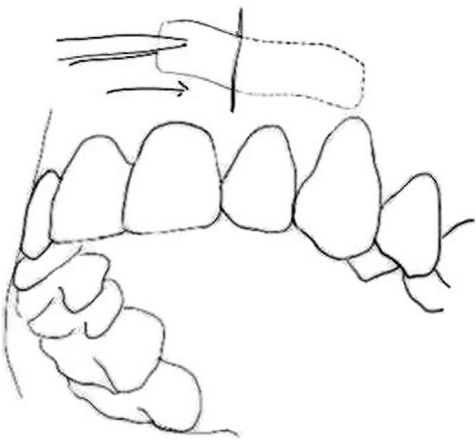


FIGURE 7 Schematic of ADM insertion through vestibular access incision.

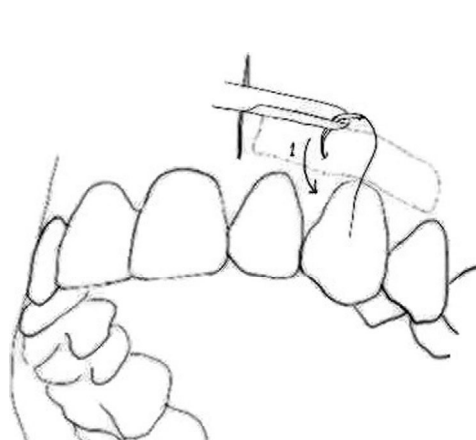


FIGURE 10 Schematic of initial suture engaging ADM graft and overlying mucoperiosteal graft within the mucosa at the mesial of #11.

of 9 to 10. The gingival thickness was such that a periodontal probe did not produce gingival color change when inserted into the gingival sulcus and was deemed of adequate thickness by the practitioner (RC). The patient reported minimal discomfort and reported no restrictions to her daily activities after 24 hours postoperatively. The

patient reported that her radicular sensitivity had been eliminated after this procedure. In postprocedural interview with the patient, the patient reported high levels of satisfaction. She stated her expectations were exceeded in

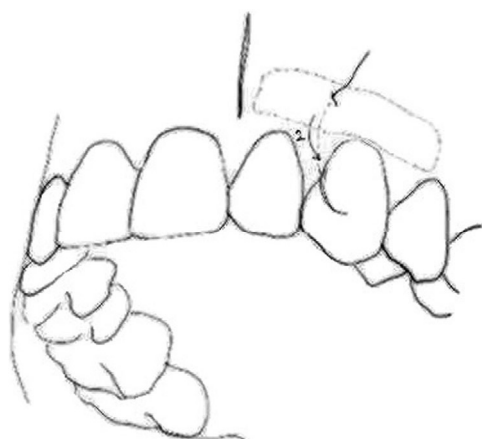


FIGURE 11 Schematic of suture exit from gingival tissue allowing tacking of ADM graft to overlying mucoperiosteal flap on the mesial of #11.

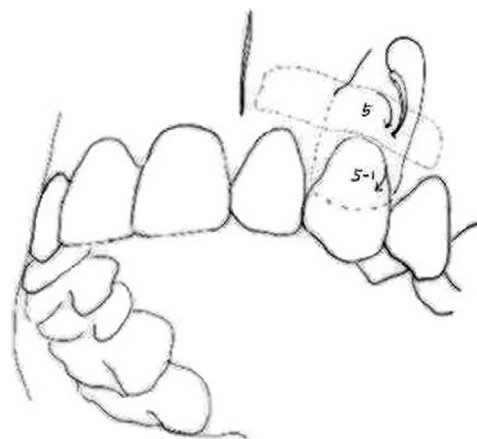


FIGURE 14 Schematic of suture engaging the ADM graft and overlying mucoperiosteal flap from the external flap surface within the mucosa on the distal of #11.

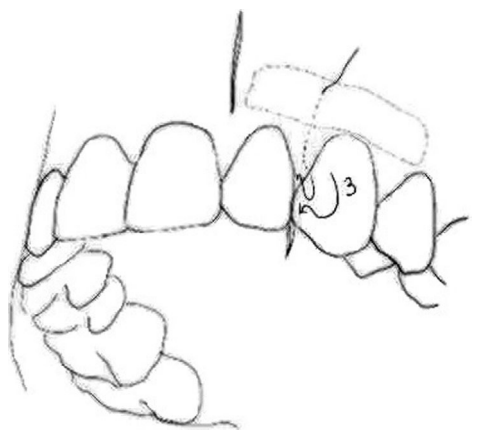


FIGURE 12 Schematic of suture passing below the mesial interdental contact to allow a mesio-distal sling suture position on the palatal of #11.

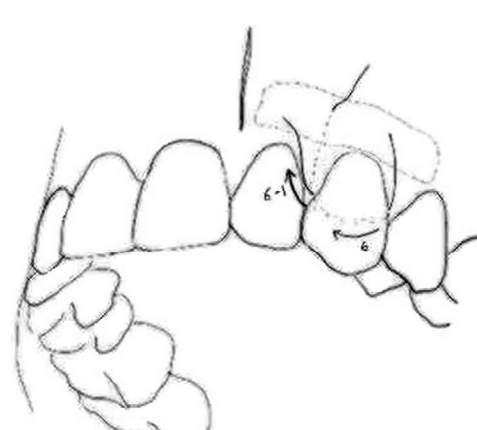


FIGURE 15 Schematic of suture passing below the contact points and being slung from distal to mesial to facilitate coronal flap and ADM graft advancement.

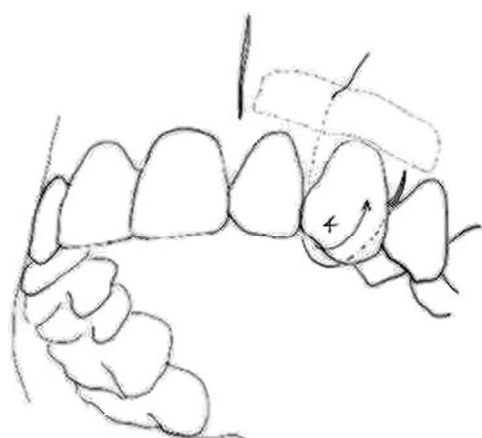


FIGURE 13 Schematic of suture passing below the distal interdental contact after a mesio-distal sling suture position on the palatal of #11.



FIGURE 16 Schematic of suture tie to secure flap and graft in a coronal position at #11.

areas of (1) intrasurgical time, (2) postoperative discomfort, and (3) final esthetic results. The surgeon (RC), a periodontist with over 15 years of experience, estimates that intrasurgical time was decreased by 25% to 30%

using this technique when compared with other soft tissue grafting techniques and that esthetic and root coverage outcomes are similar to other techniques used. Additionally, although the materials cost and patient surgical fee

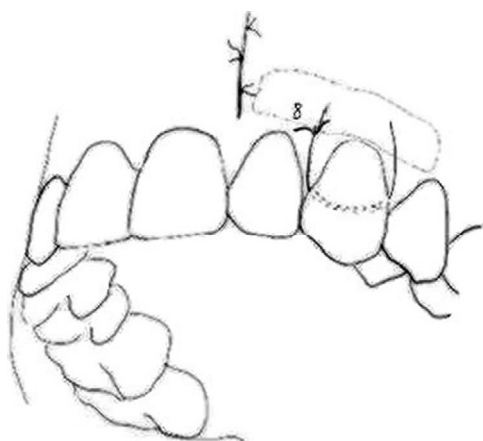


FIGURE 17 Schematic of final postoperative sutured surgical site after SAMRI technique used to address gingival recession at tooth #11.

are similar to other soft tissue grafting procedures, a decreased intrasurgical time reduces overhead expenses and may allow practitioners to see additional patients and increase profitability in their practice.

Discussion

The treatment of gingival recession defects is performed for esthetic and functional reasons and final esthetic outcomes as well as patient-centered outcomes regarding postoperative discomfort and patient satisfaction are critical to patient acceptance of therapies. Techniques to reduce postoperative discomfort and improve esthetic outcomes have been described in the literature,^{1,2,16} but remain technique-sensitive, time-consuming, and may not consistently deliver ideal outcomes. The technique presented in this report allows for full-thickness recipient site preparation, which has been demonstrated to be less time consuming than partial-thickness flap elevation and may result in decreased intrasurgical time.²⁰ The present case report uses a simplified access and recipient site preparation as well as soft tissue allograft that may decrease intrasurgical time, and thus, secondary surgical site morbidity and allow for graft and flap advancement to improve root coverage and esthetic outcomes compared to other techniques to achieve root coverage. This step-by-step approach to the technique can be abbreviated as the side access mucosal releasing incision (SAMRI) technique, which allows a blueprint of the approach.

Although other approaches to achieve root coverage using a vestibular approach have been described, these approaches differ slightly from the technique described in this report.^{13,14,21,22} The VISTA technique has been described to include root conditioning with 24% buffered ethylenediaminetetraacetic acid gel,** positioning of a col-

lagen membrane soaked in recombinant human platelet-derived growth factor (rhPDGF-BB) over the exposed root surfaces, a suturing technique that uses suture fixation on coronal tooth surfaces with composite to insure coronal positioning, and postsuturing placement of β -tricalcium phosphate (β -TCP) and rhPDGF-BB over root dehiscences.¹⁴ Many of these components are omitted in the SAMRI technique, which may allow for significant reduction of intrasurgical time. In the procedure presented in this report, the simplified flap elevation, graft placement, and suturing technique described here can reduce surgical time. There is also data to suggest that no statistically significant difference in root coverage can be noted based on differing suturing protocols,²³ so simplification of suturing should be undertaken if it can reduce surgical time while still achieving optimal results. Additionally, the use of ADM in the SAMRI technique allows for avoidance of a second surgical site when compared with autogenous grafting. In this manner, ADM may serve as a soft tissue substitute with outcomes most similar to those achieved with subepithelial connective tissue grafts (SCTGs) without the additional morbidity associated with a SCTG harvest.²

Mean root coverage for CAF with ADM at Miller Class I and II gingival recession defects has been reported in systemic reviews as ranging from 83% to 99%.^{1,24-26} It has also been estimated that the addition of ADM with CAF improved root coverage outcomes 15.6% over CAF alone.¹ Further, consistently achieving complete root coverage at all affected sites can be limited by multiple adjacent recession defects, pre-operative width of keratinized tissue, initial recession depth, exposed root surface area, and surgical technique.^{27,28}

Many factors may be associated with patient acceptance of this technique, including postoperative analgesic and anti-inflammatory and corticosteroid therapy, decreased intrasurgical time, and gingival suture location. Given the emphasis on patient acceptance, patient-centered outcomes, and esthetic success, the technique presented here may allow practitioners to provide improved esthetic and functional root coverage for patients while limiting postoperative morbidity and esthetic compromise at buccal recession defects. Future comparative research studies may be undertaken to identify optimal clinical scenarios for the SAMRI technique and to quantify clinical, esthetic, and patient-centered treatment outcomes.

Conclusions

Within the limitations of this case report, it can be concluded that the novel SAMRI technique is a simple protocol that may allow for decreased intrasurgical time and is capable of achieving optimal clinical and esthetic outcomes for patients with recession defects. ■

**Prefgel; Straumann, Basel, Switzerland.

Summary

Why is this case new information?	■ By using an offset vertical vestibular incision subperiosteal tunnel access, improved release and extension of the flap laterally may be achieved without interruption of gingival and papillary architecture even in the presence of prominent anatomical structures and with a decreased risk of disrupting blood supply to tissues that are overlying the ADM graft. ■ This case describes a less invasive surgical approach with improved patient morbidity and acceptance using acellular dermal matrix, growth factors if deemed necessary because of clinical presentation, and vestibular incisions resulting in complete root coverage and high levels of patient satisfaction.
What are the keys to successful management of this case?	■ Adequate soft tissue release must be achieved to allow for placement of the soft tissue graft within a passive tunnel created by the surgeon. ■ The graft and overlying full thickness flap must be coronally advanced without tension to a position at or above the cemento-enamel junction. ■ Graft immobility is critical for success and the graft tissue must be adherent to the underlying bone, root surfaces, and periosteum without space that may allow for accumulation of blood during the healing phase.
What are the primary limitations to success in this case?	■ Patient compliance with postoperative instructions is critical to the successful outcome in this case. Patients should be instructed not to manipulate the surgical tissues with eating or brushing, minimal rigorous physical activity should be observed to allow for stabilization of the blood clot during initial healing, and behavior modification to remove initiating factors, including factitious habits and vigorous toothbrushing should be advised. ■ Sutures must remain in place and intact for the initial 6 weeks of healing. ■ Interproximal bone height is critical to ultimate outcomes and complete root coverage cannot be anticipated at Miller Class III and IV defects.

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○ indicates key references.