



Your Roots **Are(n't)** Showing

*Using the Pinhole Surgical Technique
to treat multiple gingival defects
without scalpels or sutures*



by Dr. John Chao

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Subepithelial connective tissue graft (SCTG) techniques are considered the gold standard and the most predictable approach for treating gingival recession.¹ However, where multiple gingival defects are encountered, SCTG techniques require availability of adequate supply of donor connective tissue. Large grafts required for treatment of multiple gingival defects may be associated with significant postoperative morbidity.² Among the alternatives developed to circumvent the morbidity factors are the vestibular incision subperiosteal tunnel access (VISTA),³ the tunnel technique combined with AlloDerm (ADM)⁴ and the Pinhole Surgical Technique (PST).⁵

The VISTA technique entails:

“making an access incision in the maxillary anterior frenum, followed by elevation of a subperiosteal tunnel. In this approach, recombinant human platelet-derived growth factor BB saturated onto a matrix of beta-tricalcium phosphate is introduced using VISTA over root dehiscences to enhanced periodontal healing. A novel method of stabilization of the gingival margins is also introduced, referred as coronally anchored suturing, designed to maintain the coronal positioning during healing.”³

“Coronally anchored suturing” refers to placing composites to the facial side of the teeth to anchor sutures.

Below is a description of a typical treatment case that features the tunnel technique combined with acellular dermal matrix (AlloDerm), which:

“began with local anesthetic and sulcular incisions around each tooth. An Allen elevator was used to separate the gingiva from the periosteum through the mucogingival junction. Then, a partial-thickness dissection using a modified Orban’s knife continued apically to loosen the pouch and enable coronal advancement. The papillary tissue was lifted without cutting from the alveolar crests.

Dissection continued as needed to coronally advance the pouch as much as possible; no vertical incisions were made. ...The ADM were positioned at the level of [the cemento-enamel junction, or CEJ], and the basement matrix side was placed facing the flap, while the dermal side was placed in contact with the root surface. A subgingival double-back individual sling 6–0 polypropylene suture was used to secure the allograft to the teeth. After the ADM was placed, the ten-free tunnel was used to cover the ADM and the flap was closed with the individual sling 6–0 polypropylene suture.”⁴

PST protocol calls for the use of a 16-gauge needle to create “pinholes,” through which a full-thickness flap in the mucosa and gingiva is raised to the level of the papillae. The papillae are lifted by PST Papillae Elevators to the optimal level, about 3–4 mm coronal to the CEJs, and strips of collagen membrane measuring about 1mm by 12mm are inserted under the flap and the papillae. The distinguishing characteristic of PST is that it is both scalpel-free and suture-free, unlike other treatments.

This paper discusses, by way of two case reports, how PST may be utilized to manage multiple recession defects.

PST protocol

Presurgical preparation calls for the gingival condition throughout the mouth to be optimal at the time of surgery. Occlusal issues that may introduce fremitus or micro-trauma during the healing period are addressed by equilibration or a bite guard.

Patients are instructed to rinse their mouth with chlorohexidine for two minutes. Cervical convexity is flattened and all composite restorations are removed. Ultrasonic instruments are used to debride subgingival crevices and clear debris from root surfaces. EDTA solution is rubbed onto root surfaces for a few seconds to further clean debris. Chlorohexidine is applied by gauzes to disinfect the surgical field.

A pinhole is made with a 16-gauge needle in mucosa 4–5mm apical to the mucogingival junction. Through this hole, the PST mucosal–gingival elevators are used to separate the periosteum from the underlying bone and roots, resulting in the creation of a full-thickness flap. When mandibular premolars are involved, the hole is made at the midfacial of the adjacent cuspid. For multiple-defect sites, holes are spaced approximately 2–4 teeth apart; the exact location will be determined by factors such as severity of the recession, frenum, vascularity of the area, depth of the vestibule and tissue type.

Elevation of the flap through the pinholes is guided by visualization of the shape and movement of the instruments through the mucosa and gingival tissue. Extension of the flap coronally and horizontally

allows the specially designed Papillae Elevators with curved blades to access the papillae. Three papillae distal to the root defect and three papillae mesial to the root defect are released.

The complete release of the papillae through the use of the elevators leads to formation of a freely movable flap, which is then positioned passively 3–4mm coronal to the CEJs.

To stabilize the flap in this “overcorrected” position, a suitable choice of membrane (Bio-Gide from Geistlich) cut into 1-by-12mm strips is inserted with PST Pliers through the holes to designated locations under the flap. The number of membrane strips used depends on the quantity needed to generate sufficient tissue tension for the stabilization of the flap at the overcorrected position, without sutures,

Case report: Patient 1

Duration of operation for both arches with 18 recession sites: 2 hours, 15 minutes.

Long-term results: Oct. 19, 2015–Jan. 15, 2019 (3 years, 10 months)

This is a 53-year-old male, with controlled diabetes. With only a few exceptions, Class I and Class II recessions extended from #3 to #14 in the upper arch and #18 to #31 in the lower arch. Class II recessions are those without attached tissue (as seen at #6, #7, #11, #20, #22 and #27). Measurements of recessions varied from 2mm to 6mm at the 18 sites. Resin restorations are located at #10, #11, #13 and #14 (Fig. 1).

The patient elected to treat upper and the lower arches at one appointment.

The steps involved

1. Resin restorations removed (Fig. 2). Root surfaces were prepped and cervical convexity flattened. The deepest parts of the preps at #11 and #13 were filled with Geristore glass ionomer from DenMat (Fig. 3), and 17 percent ethylenediaminetetraacetic acid (EDTA) was used to cleanse debris from root surfaces and rinsed off with sterile water.
2. With a 16-gauge needle, holes were placed at the midfacial of #7, #4, #8, #11 and #13, 3–4mm apical to the mucogingival junction (Fig. 4).
3. With these “pinholes” for access, PST instruments with flat blades were used to elevate full-thickness flap extending from #2 to #15 (Fig. 5). Thereafter, curved-blade instruments were used to elevate papillae. Similarly, the lower arch was instrumented with straight-blade instruments, followed by papillae elevation with the curved-blade instruments (Fig. 6).
4. Collagen strips measuring 1 by 12mm were placed under the flaps (Fig. 7).
5. Digital pressure was exerted on both upper and lower flaps for 5 minutes, and then photographs were taken (Fig. 8).
6. The patient was checked the next business day, at which postoperative instructions were reiterated, reminding the patient to protect the wound by not touching it. The patient returned for postoperative visits after one week (Fig. 9), three weeks and six weeks (Fig. 10).
7. After that, the patient returned for care every six months; Fig. 11 shows the patient two and a half years after PST treatment.

surgical dressing or tissue adhesive. Once the flap has been properly stabilized, gentle digital pressure is applied to the flap for approximately 5 minutes. The pinholes are left to heal by primary intention, without suturing.

Postoperative instructions are aimed at minimizing disturbance of the wound by any physical object, directly or indirectly, for a period of six weeks. Hence, for six weeks patients are instructed not to brush or touch the wound or the adjacent teeth, and not to use any soft objects such as cotton swabs.

Postsurgical follow-up appointments are scheduled for the next business day, and then after one week, three weeks and six weeks. At the first- third- and sixth-week follow-ups, disclosing dye is applied to the wound for the purpose of

verifying patient compliance. Accumulated plaque and the dye is polished off by means of a rubber cup with pumice.

At the six-week appointment, the patient is given an extra soft brush and instructed to brush gently but thoroughly using vertical strokes, moving in a vestibular–coronal direction only. Flossing instruction emphasizes just breaking the contact point and not touching the gingiva.

Discussion

For the correction of multiple recession sites, the primary objectives of any root coverage modality are:

- To create or widen attached gingiva.⁶
- To re-create aesthetic balance (tissue matching).^{6,7}



Fig. 1: Before Pinhole Surgical Technique (PST).



Fig. 2: Before PST, without fillings.



Fig. 3: Prep.



Fig. 4: Creating "pinholes."



Fig. 5: Instrumentation of uppers.



Fig. 6: Instrumentation of lowers.



Fig. 7: Collagen placement.



Fig. 8: Immediately after PST.



Fig. 9: After one week.



Fig. 10: After six weeks.



Fig. 11: After two and a half years.

- To regenerate the “attachment apparatus,” i.e., connective tissue in the form of new cementum, periodontal ligament and alveolar bone, sometimes evidenced by keratinization of regeneration tissue.⁸
- To attain long-term results—24 months or more.⁹
- And, most importantly, to achieve the above quickly and easily, to promote the best possible patient-based outcome, especially high levels of patient satisfaction.¹⁰

The two cases described in this paper show that the above five objectives were achieved.

- Both cases show that the mucogingival apparatus was fully restored to the CEJ.
- There was no bleeding upon probing and a normal probing depth.
- Aesthetic balance was re-created, with perfect tissue match.
- Keratinized tissue was regenerated where there was none. (See lack of attached tissue at #20, #22 and #27 in Fig. 1, and at #20, #21, #22 and #25 in Fig. 12. See keratinized tissue regenerated at the same teeth, especially at #25.)
- Long-term results: Case 1 is now at three years and 10 months, while Case 2 is at seven years and nine months.

- These cases were “fast and easy.” Case 1 took 2 hours, 15 minutes, while Case 2 took 49 minutes. Patient outcome was highly satisfactory and aesthetically pleasing.

Conclusion

This paper illustrates how PST can be utilized to satisfy the parameters for correcting multiple recession sites in a “fast and easy” protocol that eschews the using of scalpels and sutures. ■

References

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Case report: Patient 2

Duration of operation: 49 minutes.

Long-term results: March 29, 2011–Jan. 23, 2019 (7 years, 9 months).

This is a 60-year-old female in good health. She presented with Class I recessions at #19 and #20, #23 and #24, and #26 and #27, and Class II recessions at #21, #22 and #25, where the recession was 5mm. Note that there was no evidence of any attached, keratinized gingiva. Recessions varied from 2–6mm (Fig. 12). Pinholes were placed at #26 and # 23, and photos were taken immediately after surgery, after 10 days, after 10 weeks and, after long-term follow-up, at seven years and nine months (Figs. 13–16).



Fig. 12: Before treatment.



Fig. 14: After 10 days.



Fig. 16: After seven years and nine months.



Fig. 13: Immediately after treatment.



Fig. 15: After 10 weeks.