

A Review of the Vertical Translation Technique for the Successful Treatment of Recession: *Clinical Applications*



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Predictable root coverage for recession has been available for several decades. Common techniques typically involve the transplantation of tissue from an intraoral donor site, such as the palate or tuberosity, to the area(s) of recession where root exposure is detected.¹⁻⁷ Other techniques that do not involve autogenous sites have included the use of resorbable and nonresorbable membranes, acellular dermal grafts, as well as a number of pedicle grafts.⁸⁻¹⁶ Depending on the classification and severity of recession, most of these techniques offer predictable root coverage and often

result in an improvement in the quality of the overlying tissues.

Despite the many treatment options to cover exposed root surfaces, it appears that the subepithelial connective tissue graft is the most widely used procedure. The advantages include predictable root coverage, increases in the zone of attached and keratinized gingiva, as well as excellent color match to the surrounding tissues. These qualities of the connective tissue graft make it an excellent procedure for surgeons; however, the risks to the patient may outweigh the benefits—at least from their perspective.

Other pre-existing conditions may also complicate the connective tissue graft procedure. For example, certain anatomical considerations such as palatal tori or tubercles may limit the amount of donor tissue available for grafting. Also, patients who are missing premolars (such as in orthodontic extraction cases) may be limited in the amount of tissue available. Patients also may have third molars that exclude the tuberosity as a potential donor site. These types of anatomical limitations may require the surgeon to harvest multiple donor sites from a patient or even require the patient to undergo multiple surgeries.

Furthermore, connective tissue graft surgery itself is not without its morbidity. Common complaints from patients include severe pain, excessive bleeding (usually from the palate), as well as temporary altered sensation in the palate.

Fortunately, newer techniques and materials have been developed that are making it easier for patients to accept treatment. One of these techniques is vertical translation.^{17, 18} The rationale behind the development of the vertical translation technique was not entirely motivated by patient morbidity. Rather, it addressed and perhaps solved the true problem with gingival recession by recognizing that it was not just the gingiva that was receded—the underlying bone was receded as well.

This is important because in any other periodontal defect that involves interproximal surfaces, the goal of therapy is to obtain regeneration of the lost tissues (bone, cementum, periodontal ligament). Why

should the rationale be any different when looking at periodontal defects on the facial surface? Common root coverage and grafting techniques only attempt to replace the lost gingival tissue, often resulting in a new connective tissue attachment. For the first time, a technique has been designed to attempt to regain true regeneration.

The purpose of this case study is to present the vertical translation technique as a viable and effective treatment option for correcting recession defects while avoiding the complications and complaints often associated with traditional grafting procedures.

Case Study

Patient Presentation

A 30-year-old man presented to the office with 4 mm of recession on

tooth No. 6 that had been noted by his dentist for the past 5 years. He said the tooth had been receded for as long as he could remember but never considered it a problem until his dentist referred him to a periodontist. The tooth was sensitive to cold, and the patient found the recession esthetically unacceptable. A connective tissue graft was previously suggested but because of the past experiences of friends and relatives that he talked with about the procedure, he had postponed treatment.

After conducting a thorough medical and dental history as well as interviewing the patient about treatment goals, the patient acknowledged his desire to have the recession corrected for esthetic reasons because the tooth appeared too long in comparison to the contralateral tooth. He was also concerned that



Figure 1—Preoperative view of the recession on tooth No. 6.



Figure 2—Initial incisions.



Figure 3—Partial thickness flap reflection.



Figure 4—Root preparation and papillae de-epithelialization.

the recession would eventually get worse and that treatment options would be limited if that occurred. The patient also wanted some relief from the cold sensitivity associated with the exposed root surface.

The clinical evaluation revealed no other periodontal defects or signs of active inflammation. No occlusal discrepancies were noted. There was 4 mm of recession on the facial of tooth No. 6 (Figure 1). The probing depth measurement on the facial of the tooth was 2 mm, which extended near the mucogingival junction. The tooth was very sensitive to cold as well as to contact by the periodontal probe. Radiographically, no signs of interproximal bone loss were evident and no other pathology was detected. Tooth No. 6 was slightly labially positioned in the arch.

Based on the clinical and radi-

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ographic findings, tooth No. 6 was diagnosed with a Miller Class I recession defect, which meant that the recession did not extend to the mucogingival junction, no interproximal bone loss was present, and 100% root coverage was possible. The etiology identified was tooth-brush trauma.

Because of the patient's fears and desires, the vertical translation technique for root coverage was recommended. Other potential options discussed with the patient included a connective tissue graft and an acellular dermal graft.

Surgical Technique

The vertical translation tech-

nique for root coverage was first developed and subsequently published by Leon Chen, DDS, and colleagues in 2002 as a means for achieving predictable root coverage without the need for a second intraoral surgical site.^{17,18} The technique involved a unique flap design and protocol as well as the use of a bone replacement graft over the exposed root surfaces. The following is a description of how tooth No. 6 was surgically corrected using this technique.

After local anesthesia with 2% lidocaine with 1:100,000 epinephrine, 2 bleeding points were established with a periodontal probe. The bleeding points were made approximately 4 mm below the tip of each



Figure 5—Bone graft placement with PepGen P-15 Flow (Dentsply Friadent Ceremed).



Figure 6—Final suturing.



Figure 7—Two-week postoperative view.



Figure 8—100% root coverage at 1 year.



Figure 9—Preoperative recession on teeth Nos. 9 and 10.



Figure 10—Final result at 18 months, 100% root coverage.

“Anecdotally, as reported by the authors, bone sounding measurements under local anesthesia have provided evidence of hard-tissue formation.”

papilla on tooth No. 6. These points represent the tips of the “new” papillae. Next, the initial incisions were made with a #15 scalpel blade. The first 2 incisions were vertical from the bleeding points and extended apically beyond the mucogingival junction; the third incision was a semilunar incision that connected the 2 bleeding points via a sulcular incision (Figure 2). Note how the anatomy of the new papillae is outlined in Figure 2.

A partial thickness flap was then elevated on the labial surface that was extended beyond the mucogingival junction to mobilize the flap (Figure 3). A large bony dehiscence was immediately visualized. Using a

#2 round diamond in a high-speed handpiece (Brasseler USA), the root surface was roughened with the goal of removing any root convexity that may be present. The existing papillae were then de-epithelialized to expose the underlying connective tissue (Figure 4).

Using about 0.2 mL of PepGen P-15 Flow (Dentsply Friadent Cere-med) the exposed root surface was then covered with the bone graft (Figure 5). After achieving graft stability, the flap was vertically translated over the dehiscence and exposed root surface to achieve the desired root coverage. The flap was sutured with 7-0 Vicryl sutures using a com-

bination of a sling suture and interrupted sutures (Figure 6). The upper lip was then manipulated vertically and laterally to ensure that the flap was without tension.

The patient’s postoperative course was uneventful. He reported no complications and only minimal amounts of pain and discomfort. He was given a prescription for hydrocodone 5/500 (Hydrocodone 5 mg/Acetaminopren 500 mg) for pain as well as 0.12% chlorhexidine rinse to aid oral hygiene. Specific oral hygiene instructions included no brushing on the grafted tooth, and a soft diet was recommended for the first week. The patient was provided with cotton tip applicators for gross debridement.

Two weeks after surgery, the sutures were removed (Figure 7), and the patient was then taken off the



Figure 11—Preoperative recession on teeth Nos. 18 to 21. Note the severity of the recession.



Figure 12—Final result.



Figure 13—Preoperative recession on teeth Nos. 29 to 31. Note the furcation involvement on tooth No. 30.



Figure 14—Final result at 1 year. Only partial root coverage was obtained over the furcation.



Figure 15—Preoperative view of teeth Nos. 6 to 11.



Figure 16—Final result after full coverage crowns were placed on teeth Nos. 6 to 11.

chlorhexidine rinse. Normal brushing and flossing procedures were not resumed until 8 weeks after surgery. Other than minor staining from the chlorhexidine rinse, the patient reported no other complaints.

The final evaluation of results was made at 1 year, which revealed that 100% root coverage had been achieved (Figure 8). The pocket depths remained below 3 mm and there was no bleeding upon probing. The inciso-apical width of the keratinized and attached gingiva was unchanged; however, it appeared that the transgingival width of the tissue appeared thicker. One criticism of the esthetic result is that there was

some minor scarring present where the vertical incisions were made. These scars are easily corrected with a gingivoplasty or dermabrasion with a No. 2 round diamond bur or a laser of various wavelengths. For this case, the patient decided against this procedure. He was satisfied with the esthetic result and also commented that his root sensitivity had disappeared.

Discussion

In the authors' private practices, the vertical translation technique has been as effective as other surgical techniques for achieving root coverage. By the nature of the technique, it

does not appear to have the dramatic gains in keratinized and attached gingiva that is often seen with soft-tissue grafting. Despite this observation, however, the root coverage that is achieved appears to be stable over time. One speculation that may explain the longevity of the results is that the attached gingiva that exists after vertical translation is often thicker in a transgingival dimension. To date, there are no case-controlled studies that compare the results of the vertical translation technique to other procedures. In addition, there is no histological evidence that the bone replacement graft used over the roots results in any new bone forma-

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tion. This would be an area of interest in the future. Anecdotally, as reported by the authors, bone sounding measurements under local anesthesia have provided evidence of hard-tissue formation.

In addition to the case study shown, there also have been several cases submitted in which the vertical translation technique has been successful for root coverage in the esthetic zone (Figures 9 and 10), multiple teeth (Figures 11 and 12), and teeth with severe bone loss and furcation involvement (Figures 13 and 14). Vertical translation also may be used with predictability in conjunction with restorative procedures (Figures 15 and 16).

Conclusion

The vertical translation technique has been presented as an effective procedure to surgically correct recession defects. Advantages of the procedure include predictable root coverage, minimal postoperative discomfort, and stability of results. Unlike traditional soft-tissue grafting procedures, vertical translation surgery allows dentists to treat an unlimited number of roots without significant discomfort or complications resulting from insufficient amounts of available tissue. This allows patients to be treated with minimal chairtime in fewer visits.

Vertical translation is the result of a paradigm shift in the way den-

tists view gingival recession. The primary concern with recession is the loss of both gingiva and bone that houses the affected portion of the root, which provides most of the stability. Therefore, the most important tissue to replace on a recession defect is bone, not soft tissue. By using a bone replacement graft in the technique, the aim is to regenerate all of the lost tissues (bone and soft tissue) not just part of it (soft tissue). From a biologic rationale, the vertical translation technique is the more logical choice for treating recession compared with connective tissue autografts or allografts. Further investigation is needed to confirm the clinical observation of new bone formation.

As reported by Chen, the pioneer of this technique, it was observed that new bone formation had occurred via bone sounding at 1 year after surgery. No histology or surgical re-entry data are available because of the lack of willing human participants. This will be an area of interest in the future. **C**

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