Depressions in the alveolus may result from (1) extraction of a tooth with subsequent loss of the labial alveolus, (2) extraction of teeth with advanced bone loss from either periodontal disease or apical pathology, and (3) developmental defects (Fig. 1).

**TREATMENT PROBLEMS**

Alterations in ridge contour necessitate cosmetic compromises in prosthetic restorations. Attempts have been made to correct this problem by using various fixed and removable devices. In fixed prosthodontics, reconstruction of a concave alveolar ridge is often managed by modifying the thickness and height of the pontic to compensate for the depression. The resultant overcontoured surface, however, is a potential food trap. In addition, the alveolar tissue above the pontic appears darker than the adjacent gingival tissue. Pink acrylic resin has also been added to the gingival parts of pontics to resemble lost gingival tissue, but the results of this technique have been less than ideal.\(^{1,2}\)

The presence of an alveolar depression adjacent to an abutment tooth for a removable prosthesis in a cosmetically obvious location has been a major problem. To restore normal labial alveolar arch form, the acrylic resin flange must be placed in close proximity to the abutment tooth to simulate harmonious contour. This may interfere with the path of insertion or removal of the prosthesis and also impinge on the adjacent gingival tissue. A prosthetic, surgical technique will be described which has the capacity to eliminate some of these difficulties.

**PROSTHETIC TECHNIQUES**

Where a fixed partial prosthesis is planned, a heat-cured acrylic resin temporary restoration of the abutment retainers and pontic is fabricated on diagnostic casts. In most situations, the casts are made prior to tooth extraction and preparation of the abutment teeth. Fig. 2 shows a patient with a temporary prosthesis which was made before the extraction of the maxillary central incisors which had advanced periodontal disease.

The abutment teeth are prepared, the indicated

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**Fig. 1.** A severe alveolar ridge concavity located between the maxillary left central incisor and canine.

**Fig. 2.** A preoperative view of maxillary central incisors with advanced gingival recession. A cosmetic defect and additional recession is anticipated after extraction of both central incisors.
Fig. 3. An autogenous connective tissue graft is removed from the prepared palatal donor site.

Fig. 4. Internal bevel flaps on palatal tissue are used to eliminate pocket depth.

Fig. 5. The removal of the excised collar of connective and epithelial pocket tissue.

Fig. 6. A split-thickness flap peripheral to the alveolar ridge is prepared with a No. 15 surgical blade.

teeth are extracted, and the temporary prosthesis is relined to establish an accurate fit to the preparations. The relined temporary prosthesis is then temporarily cemented in preparation for the graft procedure.

The connective tissue autograft procedure can immediately follow placement of the temporary prosthesis for patients whose teeth have been previously extracted. However, in situations where teeth are extracted at the same visit as the placement of the temporary prosthesis, at least 1½ to 2 months should elapse before the grafting procedure to allow for proper healing of the extraction site.

SURGICAL

Donor site—normal periodontium. A horizontal internal bevel incision using a No. 15 surgical blade is made on the palate 1 mm apical to the free gingival margin of the posterior teeth. Vertical incisions are made at either end of the horizontal incision to allow for the reflection of a split-thickness flap.

The length of the horizontal incision is dependent upon the dimension of the concavity to be filled. The split-thickness flap is reflected away from the underlying connective tissue base. This tissue is dissected away from the underlying bone and will be used as the donor material (Fig. 3). The marginal gingiva is left untouched. The split-thickness flap is then replaced over bone and coapted to the marginal gingiva completely covering the denuded bone. The connective tissue is stored briefly in a moist, sterile gauze pad for future use.

Presence of periodontal pockets. Internal bevel flaps are made in the manner used to eliminate periodontal pockets on the buccal and palatal sur-
TISSUE GRAFIX

Figs. 7 and 8. Reflection of the split-thickness flap uncovering a connective tissue base.

Figs. 9 and 10. Reflection of the split-thickness flap uncovering a connective tissue base.

Fig. 9. The split-thickness flap sutured over the inserted donor graft correcting the depression of the alveolar ridge.

Fig. 10. Postoperative result after a subepithelial graft procedure showing a partial regeneration of the augmented ridge. A residual defect is still present.

faces. The excised pocket wall of the connective and epithelial tissue is removed (Figs. 4 and 5). The epithelium is excised from the connective tissue and discarded. The remaining connective tissue will be used as the donor material. It is stored in the same manner as previously described.

Recipient site. In the pontic region, a split-thickness flap is elevated proximal to the adjacent abutment teeth (Figs. 6 and 7). Periosteum and connective tissue are allowed to remain over the alveolar ridge which will become a source of blood supply to help nourish the autogenous connective tissue graft (Fig. 8).

The donor connective tissue is placed between the elevated split-thickness flap and the alveolar ridge with its periosteum and connective tissue covering. The flap is then sutured over the donor tissue to immobilize it in the desired position (Fig. 9). It will also serve as an additional source of blood supply to nourish the connective tissue graft. Following the surgical graft procedure the temporary prosthesis is modified, if necessary, to conform to the augmented ridge. It is temporarily cemented, a periodontal dressing is placed in the usual manner, and the patient is given normal postoperative instructions.

The dressing and sutures are removed after 1 week and the region is either left uncovered or redressed for an additional week. Healing is usually uneventful. Secondary procedures to either add more tissue or reduce irregularities by gingivoplasty may be required to further enhance cosmetics (Figs. 2, 10, and 11).

The height and contour of the pontics of the temporary prosthesis must be altered after the surgical procedure since they were fabricated on the
Fig. 11. A second graft showing total correction of the alveolar depression. Note the normal length of both central incisor pontics.

Fig. 12. Preoperative view of the maxillary left central incisor and ridge showing a depression that resulted from a traumatic injury and unsuccessful apical surgery.

Fig. 13. Postoperative view of the same site following the subepithelial graft procedure. The height, width, and depth of the ridge have been restored. The pontic can now be fabricated to a normal gingival contour.

Fig. 14. Preoperative view of the maxillary left lateral incisor showing a depression in the alveolar ridge.

Fig. 15. A 1½-year postoperative view of the augmented ridge.

diagnostic cast with the ridge deformity. Failure to do this will prevent complete seating of the temporary prosthesis and cause pressure necrosis of the graft site after temporary cementation.

OBSERVATIONS

The described subepithelial graft procedure has been performed for about 30 patients. While the procedure is only 2 years old, none of the grafts have failed or receded from their postoperative healed position. It was observed that the augmented ridge became dimensionally stable approximately 2 months after the graft procedure (Figs. 12 through 15).

SUMMARY

A technique has been described which can augment concavities and irregularities in edentulous
Tissue Grafts

Ridges where cosmetics are important. Using the combination of temporary acrylic resin restorations and connective tissue autografts, unattractive cavities and ridge irregularities can be corrected.

References

Reprint requests to:
Dr. Burton Langer
1075 Central Ave
Scarsdale, NY 10583

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