The retention of vital submucosal roots under immediate dentures: A surgical procedure

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The use of submucosal vital roots under complete dentures appears to retard the resorption of residual alveolar bone.[1-5] This procedure also eliminates the patient's responsibility for maintenance of gingival sulcus health, as required for overdenture abutments. Clinical experience with this technique suggests that thorough diagnosis, followed by a correct surgical technique and the fabrication of optimal prostheses, is essential if adequate residual alveolar ridge preservation is to be expected.

In this article we describe a surgical technique for the retention of vital submucosal roots for a patient treated with a complete maxillary immediate denture (Fig. 1).

METHOD

A surgically clean operating space and sterile technique must be used throughout the surgical procedure. A sufficient number of teeth should be selected to help healthy remaining tissues in the surgical site are of utmost importance, the surgical skills of a periodontist were used for treatment. Presurgical medications and anesthetics of the surgeon's choice were administered. All existing restorations or carious areas were removed to reduce the possibility of debris entering the wound site during the sectioning of the crown and root at a later stage in the surgical procedure. In the patient described (Fig. 1), six maxillary teeth were sectioned and submucosally retained. An internal beveled incision apical to the unattached gingival sulcular tissue

Fig. 1. Six maxillary teeth selected for submucosal vital root retention.

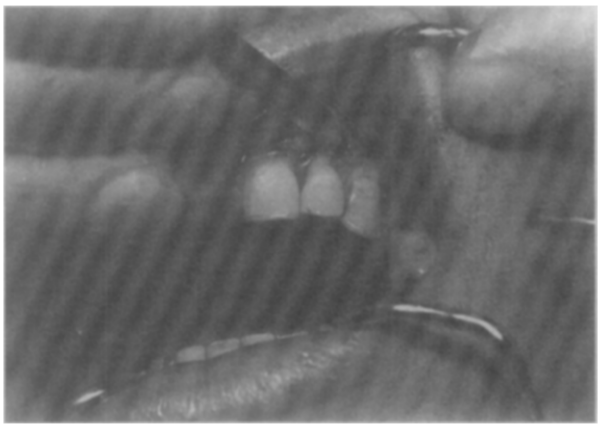

Fig. 2. Internal beveled incision.

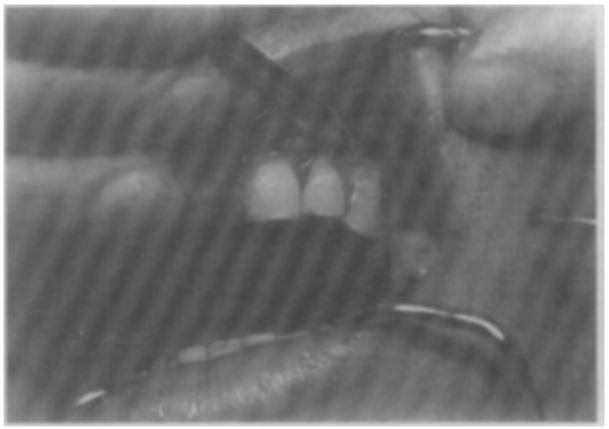

Fig. 3. Soft tissue and calcular deposit removal.

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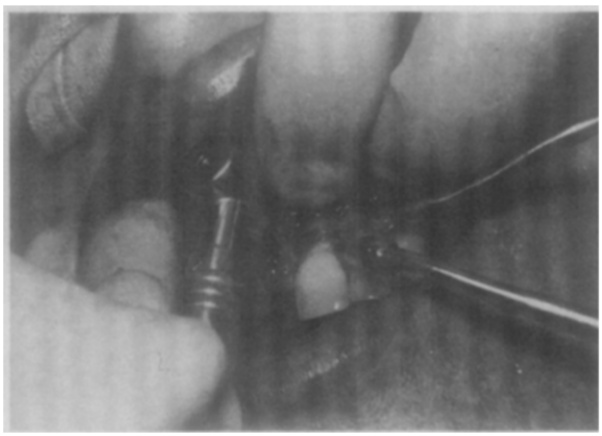

Fig. 4. Initial tooth sectioning at level of healthy alveolar bone.

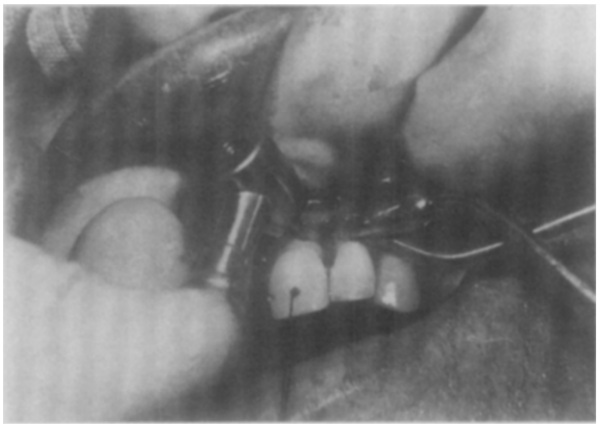

Fig. 5. Tethering suture placed through crown.

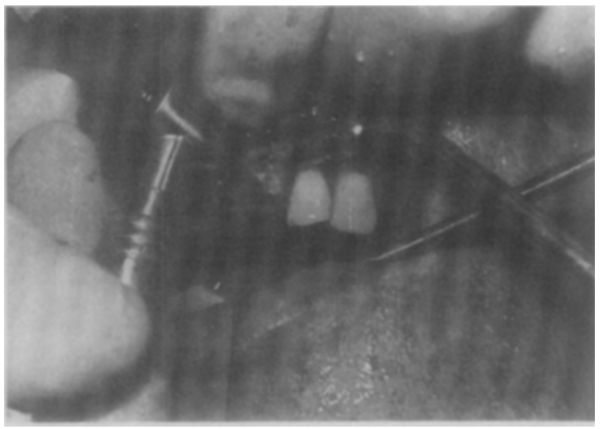

Fig. 6. Final sectioning of tooth.

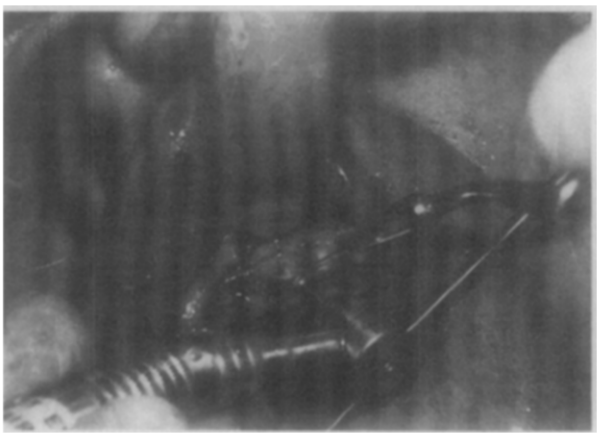

Fig. 7. Tooth contouring contiguous with adjacent bone.

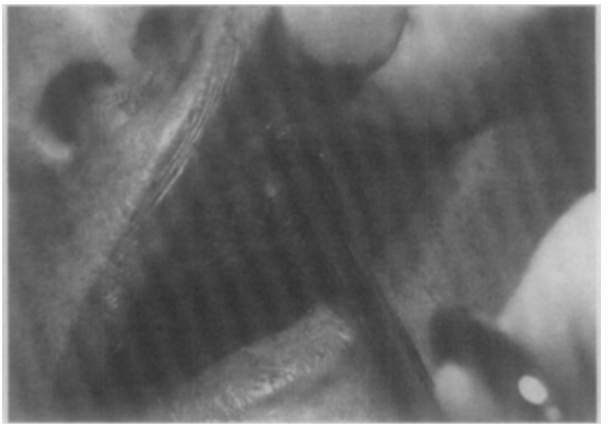

Fig. 8. Submucosal blunt dissection.

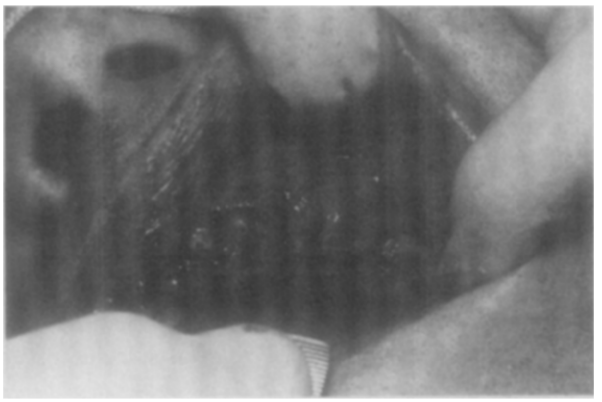

Fig. 9. Tissue approximation for presuturing evaluation.

was made, while ensuring that the incision involved the crevicular epithelium and ended at the level of adequate bony formation (Fig. 2). The attached gingiva was elevated; and unattached gingival crest tissues, subgingival calcular deposits, and any granulomatous tissues were removed with a spoon-type excavator (Fig. 3).

Diseased hard and soft tissue adjacent to the retained teeth was removed, and the teeth were sectioned on a horizontal plane at the level of healthy residual bone (Fig. 4). A tethering suture was placed through a hole cut in the incisal/occlusal edge of each tooth and attached to a patient drape using a needle holder (Fig. 5) to eliminate the risk of accidental aspiration of the

Fig. 10. Start of mattress suturing.

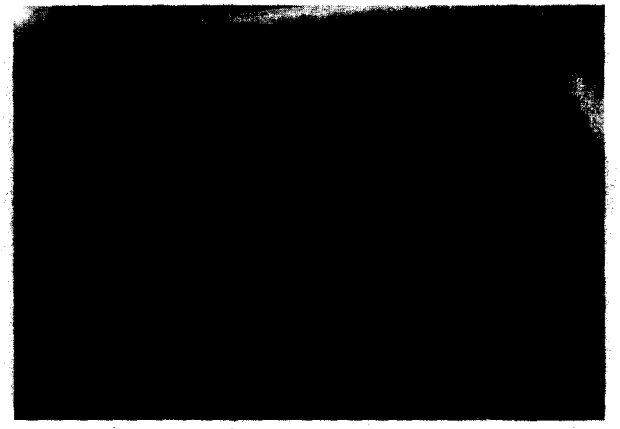

Fig. 11. Mattress sutures oversewn with a continuous suture.

sectioned crown. Oral cavity gauze packing is also a good preventive method to minimize risks of such surgical emergency. The circumferential sectioning technique probably reduces pulpal trauma (Fig. 6), and bleeding pulpal tissue should be evident and appears essential for the continued vitality of the retained root. Endodontic therapy may be necessary and depends on the diagnosis of the pulpal condition at this time,[2] although careful preliminary evaluation with radiographs and vitality tests should prepare the operator for any possible endodontic intervention.

The surface of the sectioned root was made smooth and contiguous with the healthy adjacent bony crest (Fig. 7). Deep submucosal blunt dissection for the purpose of relaxing the mucobuccal fold tissues may sometimes be necessary to provide sufficient loosened tissues for suturing without excessive suture tension (Figs. 8 and 9). Tissue closure was accomplished using a mattress suturing technique to approximate the wound edges (Fig. 10) and then by oversewing with a continuous suture over the retained roots (Fig. 11).

Fig. 12. Immediate maxillary denture in place.

Fig. 13. Immediate postsurgical radiographs.

Fig. 14. Soft tissue 2 months after surgery.

The subsequent prosthodontic sequence followed conventional protocol and objectives.

The fit of the inserted immediate denture was refined with a tissue treatment lining material (Fig. 12), and the patient was instructed to apply external ice packs in a 30-minute time interval program for the next 4 to 6 hours. The patient was further instructed to leave the prosthesis in place and to return the next day for prosthesis removal, denture base adjustments, and soft tissue evaluation so as to avoid denture irritations

or wound edge separations, which should be dealt with as soon as possible following surgery. Harmonization of occlusal relationships in all eccentric positions is essential and best accomplished by occlusal adjustment 48 hours following surgery and during subsequent recall appointments.

The described procedure evolved over a 6-year evaluation period of different surgical and postsurgical treatment methods and has proved reliable, with a predictably comfortable postoperative experience for the patient.

Immediate postsurgical radiographs show root surfaces that are contiguous with adjacent bony formation in most instances (Fig. 13). The areas that do not completely conform to this root/bone contour are probably of little concern. Cook et al.[4] reported new bone formation in bony defects that were free of epithelial proliferation and inflammation. Long range results have been previously reported and are favorable for alveolar ridge preservation (Fig. 14).[2]

SUMMARY

An approach to soft tissue management and surgical crown/root sectioning for submucosal vital root retention has been presented. Attention to detail during soft tissue reflection, tooth sectioning, and the relaxing of attached mucogingival tissues is very important. Adequate healthy soft tissue is necessary for proper suturing over the retained roots. Postoperative complications are reduced by placement of well-fitted prostheses. Clinical evaluation of this technique has proved it to be highly successful.

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