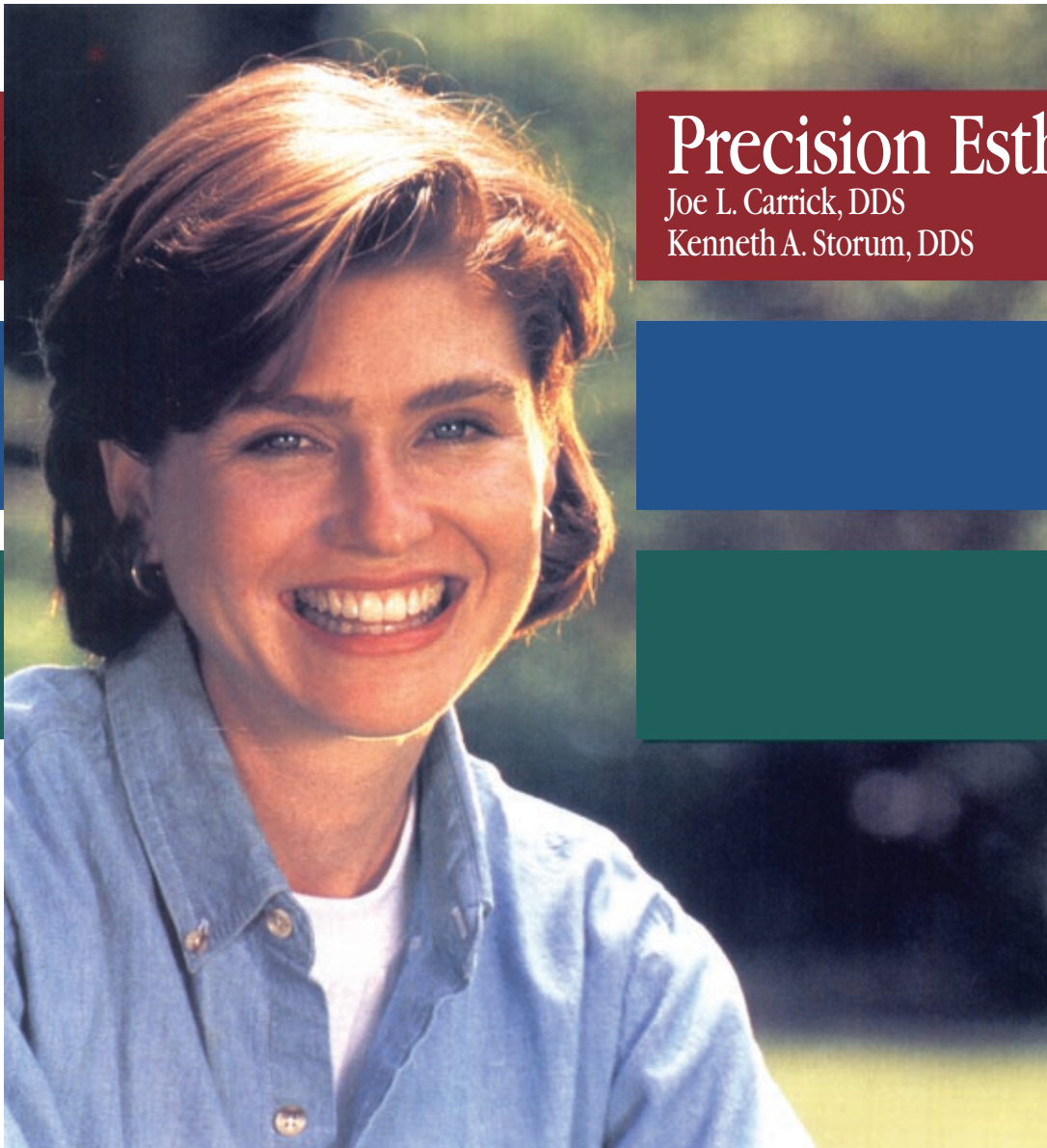


DIALOGUES

IN *Esthetic* DENTISTRY™



Precision Esthetics

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Precision Esthetics

THE BENEFITS OF RETAINING ROOTS TO STABILIZE PROVISIONAL IMPLANT PROSTHESES

The two most challenging aspects of treatment planning for implant-supported dentures are correct placement of the implants and the manufacture of an esthetic, functional, and comfortable provisional appliance. When grafting is indicated, the transitional phase between extraction of the remaining dentition and placement of the definitive prosthesis can require 1 year. A mechanically retentive provisional appliance enables many patients to better tolerate the transitional healing period. This article demonstrates that, in many cases, endodontically treated teeth with ERA[®] coping^a can be retained indefinitely, creating greater stability and retention of the provisional appliance, reducing loading and trauma over grafted or implanted areas, reducing the number of implants required for the final prosthetic appliance, and maintaining proprioception.

The loss of natural teeth and the stigma of wearing a denture can be very stressful. A nonretentive and mobile denture is truly frightening, especially if the patient has never been edentulous.

Case One

This 61-year-old senior executive's appearance was extremely important to him. Initially, he was advised to get an implant-retained, removable prosthesis but declined because of the time

Endodontically treated teeth with ERA copings can be retained indefinitely, creating greater stability and retention of the provisional appliance.

required for integration, the inconvenience, and the stigma of wearing a full denture. Instead, he opted for a six-unit, fixed, anterior maxillary bridge supported by his left and right maxillary canines and lateral incisors. A precision partial denture was attached to the bridge that extended to the second molars bilaterally. There were clinical signs of bruxism against his lower natural dentition (Figure 1A). Less than 2 years after the reconstruction, all four abutments fractured at the gingival crest (Figures 1B and 1C).



► **Figure 1A**—Case 1—Patient presented with severe wear on the lower anterior teeth from parafunctional habit and long clinical crowns.



► **Figure 1B**—Radiograph of four upper teeth with unfavorable crown-root ratio and significant bone loss in the upper edentulous area.



► **Figure 1C**—Fractured upper right cuspid. The other teeth exhibited supra-gingival circumferential fracture lines.



► **Figure 1D**—Teeth prepared for copings and ERA[®] female attachment.

Using ERA attachments on the retained tooth roots was more acceptable to the patient than a conventional denture. A post preparation was made within the remaining teeth to provide adequate surface area for bonding the ERA copings (Figure 1 D). Impressions were taken for the copings and the provisional appliance was delivered. Two days later, the copings were bonded (Figure 1 E). The male ERA attachments were picked up in the provisional appliance with InstaTemp^{TM,a}.

After the appliance had fractured distal to the canines several times, it was apparent that implants would be necessary. A diagnostic wax-up was performed. After establishing the ideal position of the teeth, the wax try-in was duplicated in clear acrylic and the male ERA attachments were picked up as described previously, providing the surgeon with a stable surgical stent for accurate determination of implant placement and for determining the necessity

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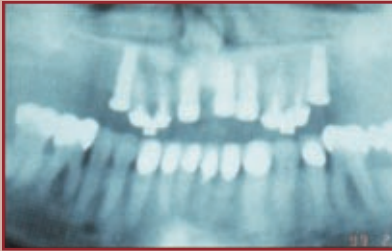




➤ **Figure 1E**—Copings in place. Marking shows where to relieve denture base over implants that have been placed.



➤ **Figure 1F**—Solid clear acrylic surgical stent produced from diagnostic wax-up with ERA® male attachments to stabilize it during implant placement.



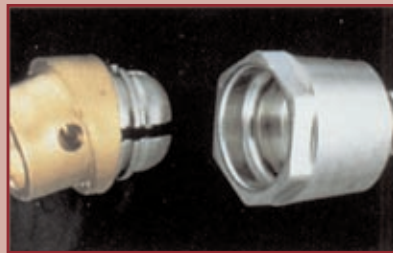
➤ **Figure 1G**—Implants in place.



➤ **Figure 2A**—Severe bone loss in the upper bridge and around implants in the mandible.



➤ **Figure 2B**—Implants with parallel ERA abutments before replacing the O-ring abutments with additional ERA abutments to correct nonparallel implants.



➤ **Figure 2C**—ERA abutment used to correct for nonparallel implants that had O-ring abutments.

for osseous augmentation (Figure 1F). The patient elected a radical alveoplasty to avoid the 6-month wait for osseous integration before implant placement. Osteotomes were used to expand the cortical bone and produce recipient sites for three 5 x 10-mm implants.

To aid in retention and prevent flexion and fracturing of the final prosthesis, 5 x 15-mm implants were placed distal to the canines. The surgical stent indicated that placement of the right implant would require a sinus lift and augmentation at the time of placement (figure 1G).

The implant fixtures were uncovered after 6 months of integration. The tissue was allowed to heal for 2 weeks while the patient wore the ERA®-retained provisional appliance. Impressions were taken of the patient's five implants with ERA attachments in addition to the two ERA attachments supported by his lateral incisors and canines. Male ERA attachments were

placed on the three anterior and two posterior implants and then passively picked up within the denture using InstaTemp™. ERA implant abutments are made to fit many different implants, but a superior fit may be obtained when mated to Sterngold's ImplaMed® implants (which have a lifetime warranty when used with ERA® attachments).

The patient is pleased with the functional and esthetic results of his combined tooth/implant ERA-retained prosthesis and has experienced no complications or sequelae.

Case Two

This 56-year-old woman required extraction of her remaining mandibular dentition as a result of unsuccessfully treated periodontal disease. No attempt was made to salvage selected teeth to aid in retention of a provisional appliance. the patient was unhappy with the poor support, retention, and esthetics of her

provisional appliance and, 8 weeks later, 5 standard external hex implants were placed into the areas of teeth Nos. 19, 21, 23, 27, and 30. The surgeon used a conventional mandibular denture stent as a surgical guide for implant placement. Because of the instability of the stent, the implants could not be placed parallel to the loading forces.

After 3 months of integration, the implants were uncovered, and ball and O-ring attachments were placed. The patient was able to wear her lower denture for several years, but circumferential bone loss of implants occurred in the areas of teeth Nos. 19 and 23 (Figure 2A). The angled implant placed into the No. 23 area required removal, and the implant in the areas of tooth No. 19 area was salvaged with bone grafting and alveoplasty. Placement of two additional implants into the areas of teeth Nos. 24 and 20 was also necessary. During integration, a new provisional appliance was fabricated using ERA attachments on the remaining four implants (Figures 2B and 2C).

At this stage, it was clinically and radiographically evident that the left maxillary bridge—supported by the maxillary left canine, first premolar, maxillary left first molar, and second molar—was failing. The maxillary left canine and first premolar were endodontically treated. An impression, jaw relation, and subsequent was try-in established the correct vertical dimension and position of the maxillary anterior teeth (Figure 2D).

The maxillary second molars, which had super-erupted, were left to aid in the retention of the provisional appliance. Because of this super-eruption, the occlusal plane on the provisional was not totally corrected.

A transitional denture was fabricated simultaneously with a clear acrylic surgical stent. A void was placed over the anterior maxilla and filled with tissue conditioner to allow adequate space to restore the anterior maxilla with osseous grafting. The maxillary first molar was extracted, and the canine and first premolar were reduced to the gingival crest. Intracoronal preparations were made to retain the female attachments on maxillary left canine and first premolar. As in Case 1, an immediate transitional was placed. The copings were bonded 2 days

later, and the male attachments were secured within the denture intraorally.

The ridge was grafted using autogenous bone harvested from the external oblique ridge bilaterally. During the integration of the bone graft, the provisional appliance was altered to allow for the facial and vertical addition of bone.

After 6 months, bone sounding with a fine 30-gauge needle indicated that the bone graft was integrated. The ERA-retained surgical stent demonstrated an adequate augmented osseous ridge for placement of implants. The four 3.8 x 12-mm external hex implants were placed. Her provisional appliance was adjusted, and antibiotics and Peridex[®]^b were prescribed for 1 week.

During the 6 months of implant integration, the patient was able to wear the maxillary provisional appliance retained by two ERA attachments on the left canine and first premolar and partial denture clasps on her second molars bilaterally. She was comfortable and able to masticate without limitation.

At 6 months, the 4 anterior implants were integrated and uncovered via crestal incision. Healing caps were placed and the keratinized tissue was sutured around the implants circumferentially. The implants were extremely parallel and positioned correctly within the anterior maxilla with the aid of an ERA-retained surgical stent (Figure 2E). Because the implants were parallel to each other and because of the existing copings on the patient's natural teeth (Figure 2F), the least retentive white mail ERA attachments were used. At this time, the patient decided to retain the maxillary second molars via endodontic therapy and copings. To allow for a vertical stop with no retention, white male ERA attachments were applied, with the center retentive portion removed.

The final prosthesis was extremely stable, retained by six ERA's on the patient's four anterior maxillary implants, left canin, and first premolar. The posterior second molars provided additional support and stability (Figure 2G). The final prosthesis provided proper lip support, incisal exposure, and masticatory function. The prosthesis is not cantilevered anteriorly, and



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all masticatory forces are directed along the axis of the implants. The patient has maintained her reconstruction well and has been followed every 3 months for 2 years.

Discussion

Edentulous cases can be challenging for the patient and the dentist. A patient about to have his or her remaining dentition removed may not be physically or psychologically ready for a denture. A transitional prosthesis that uses selected teeth may aid the patient in making this transition. The teeth to be used in these cases need to be selected based on sound dental principles. After endodontic therapy and after the clinical crown is reduced to the gingival crest, a tooth with a one-to-one crown-to-root ratio and slight mobility may be an ideal candidate. The lateral forces placed on the tooth are now biomechanically more favorable.

When teeth are retained and ERA attachments are used during the transitional period, the patient can adjust to a fixture prosthesis. The dentist can evaluate the necessity, number, and optimum placement of implants required to better meet the patient's demands. It is helpful in fabricating a reproducible surgical stent that doesn't depend on soft-tissue support alone. The difficul-

ty of obtaining a passive fit to multiple dental implants with a rigid metal framework or bar is well documented. Picking up ERA attachments with an acrylic base allows for a more passive fit and reduces destructive lateral forces. ■

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^b Zila Pharmaceuticals, Inc, Phoenix, AZ 85014