RADIOTHERAPY AND THE DENTIST*

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IN order to offer a patient the most efficient treatment, various members of the health profession team are often called upon to play a role in the management of his disease.[6]

The importance of a cooperative approach by the radiotherapist and dentist to minimize postirradiation oral problems in patients with head and neck cancer has undisputedly been established.[3–5] In addition to this, the dentist's skill and knowledge of prosthetics and materials can frequently be very useful for the radiotherapist in preparing radiation aid appliances which protect peripheral tissue, expose lesions, and index the radiation machine to an accurately repeatable position.[1,2]

In this article we shall discuss construction and application of several appliances which have been used in radiation treatment of various neoplastic lesions.

PROSTHETIC APPLIANCES

The protection of peripheral tissue is of great concern in radiation therapy, especially in the head and neck, when lesions are located near the eyes. Protective lead shielding, for areas with complex anatomy such as the face, is easily constructed on a cast from a hydrocolloid impression. Lead sheeting of 1.5 mm. thickness has sufficient malleability to be adapted closely to the anatomy. The lesion is exposed by cutting through the lead with a sharp scalpel (Fig. 1).

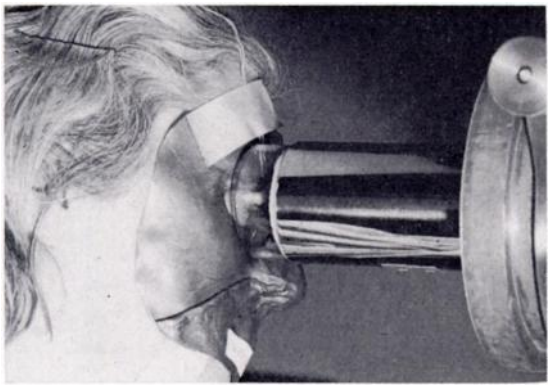

FIG. 1. Lead shield, contoured on a stone cast of the face, in position during radiation therapy.

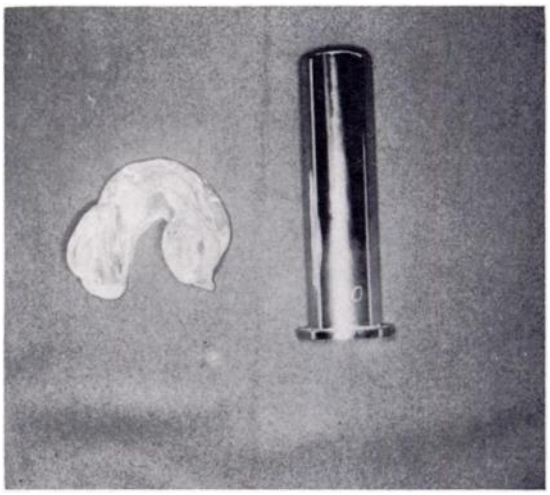

FIG. 2. Two components of an indexing prosthesis used in treatment of a floor of the mouth lesion. Acrylic segment relates to maxilla and mandible, displaces the tongue and accommodates the cone.

Teeth, or even edentulous ridges, can serve as stabilizing points of indexing devices for the radiation machine. Figures 2 and 3 show a prosthesis used in the treatment of floor of the mouth cancer. The clear acrylic segment is made on intraoral impression casts and relates securely between the maxillary and mandibular ridges. When inserted, the tongue is displaced by

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Fig. 3. Assembled appliance in position.

the flange of the appliance, exposing the lesion to the center of the cone, which fits securely into the anterior portion of the acrylic segment.

The appliances in Figures 4 and 5 are a docking device for the radiation machine in treatment of a lesion on the posterior pharyngeal wall. The remaining natural teeth are the indices for the acrylic prosthesis. When intermaxillary fixation is achieved, by having the patient close into the occlusal index areas, the tongue blades

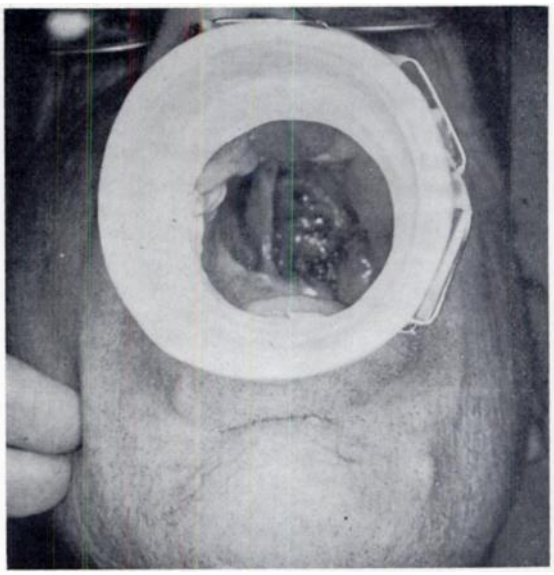

Fig. 5. Appliance inserted. Notice clear access to the lesion.

are advanced to displace the lips and cheeks out of the path of the beam.

Positioning of radium needles for surface treatment of intraoral malignancies can be achieved by making use of the patient's denture prostheses. For treatment of a palatal lesion, the maxillary denture was reproduced in lead (Fig. 6). The radium needles are strategically positioned in

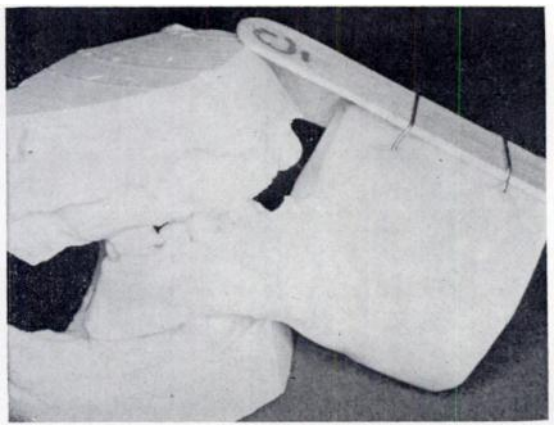

Fig. 4. Docking device positioned between casts of maxillary and mandibular teeth. When inserted in the mouth, tongue blades are advanced to displace lips and cheeks. (From Carl, W., Schaaf N. G., and Schoemann, D. Radiation docking device, *J. Prosthet. Dent.*, 1973, *29*, 97-99; and the C. V. Mosby Company, St. Louis, Mo.)

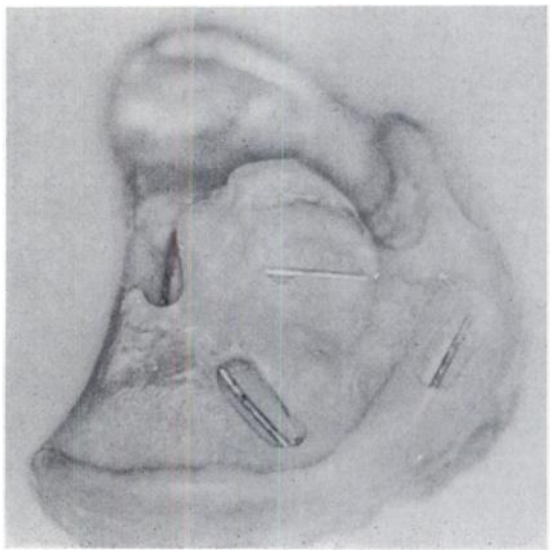

Fig. 6. Maxillary denture reproduced in lead. Note chambers for positioning of the radium needles.

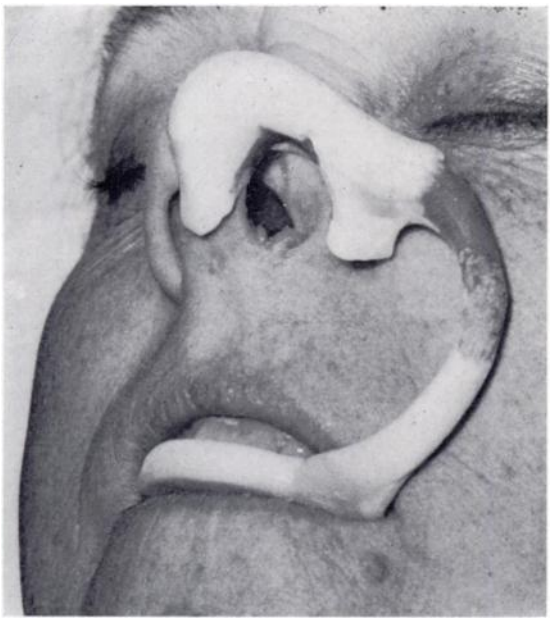

FIG. 7. This acrylic structure is connected to an intraoral bite block. It elevates the ala of the nose and exposes a basal cell lesion.

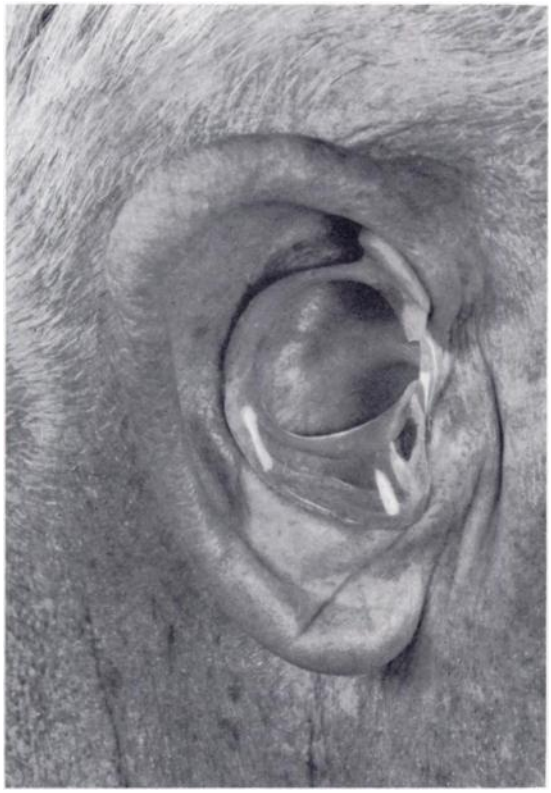

FIG. 8. Appliance acts as a spring and exposes basal cell lesion in the concha of the auricle when released.

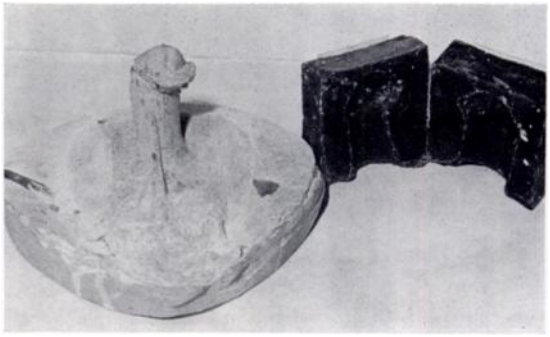

FIG. 9. Stone cast of penis and wax molds used for maintaining erect position.

chambers on the tissue side. When the lead base is inserted over the maxillary ridge, the same relationship between the lesion and source of radiation is consistently maintained.

Intraoral structures may sometimes serve to stabilize radiation aids for exposure of extraoral lesions. The acrylic device in Figure 7 elevates the ala of the nose and exposes the area to be irradiated. Stability is achieved by connection with a bite block held between the teeth. During treatment the peripheral tissue is protected by a lead shield as described above.

Mechanical aids for radiation therapy of the external ear sometimes require a particular approach in construction. The appliance in Figure 8 has a coil spring action and when released displaces the antihelix, antitragus, tragus and anterior superior part of the helix for treatment of a basal cell carcinoma in the concha of the auricle.

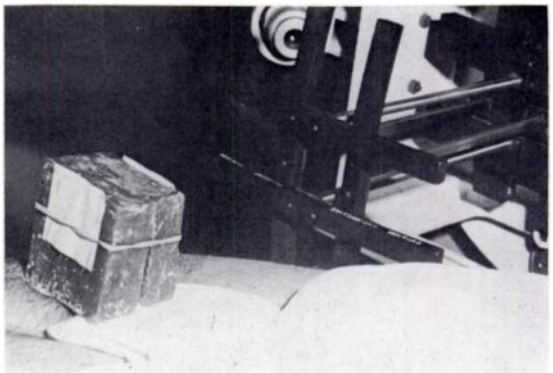

FIG. 10. Mold positioned for treatment of lesion.

All these prostheses can be easily inserted at each treatment session, either by the patient or the radiation technician.

A dentist's activity, when working with the radiation therapist, is not always restricted to the head and neck. His abilities and knowledge of methods and materials may well be used in areas distant from his traditional domain.

A 49 year old patient presented with squamous cell carcinoma of the glans penis. Surgical approach to eliminate the lesion was understandably refused. In order to treat the lesion with radiation, a wax mold was required to produce a repeatable position. For this a stone cast of the penis was made from an impression with dental materials and equipment. The wax mold was constructed in two halves (Fig. 9). Figure 10 shows the mold positioned in relation to the radiation machine.

SUMMARY

In this article but a few ways in which the prosthodontist can provide valuable help to the radiotherapist in treating his patients are discussed.

Undoubtedly, there are many useful services he can render in other branches of medicine.

It is emphasized that improved communications between the various medical and dental specialties in the interest of the health and comfort of the patients are important.

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