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Radiation stents: Minimizing radiation-induced complications

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Dear Editor,

We thank and appreciate the authors of the articles entitled "Radiation oncology: Colors and hues" and "Acute radiation toxicity in head and neck and lung malignancies" for putting forth their valuable perspectives regarding radiotherapy (RT), its complications during treatment of cancers, and its management.[1,2] Munshi has rightly said that cancer treatment requires a multidisciplinary team approach and the judicious use of this very powerful anticancer modality is of paramount importance. Laskar and Yathiraj pointed out that certain toxicities like mucositis are seen in almost 100% of patients during head and neck RT and despite tremendous scope for research, very little has been done regarding the prevention and management of the same.

The treatment of head and neck cancers with RT is a much more talked upon issue and comparatively very less heed is paid to the protection of normal tissues from inadvertent side effects of radiation therapy. Sir, in my opinion, protecting normal tissues from radiation injury is as important as it is to target diseased tissues with radiation as the success of RT is often limited by sequelae to the surrounding tissues outside the treatment field. As an old saying goes that "Prevention is always better than cure", so focusing on the modalities that prevent/reduce the complications associated with RT, seems to be a more logical approach. In addition to the use of radioprotective drugs like palifermin, benzydamine mouthwash,[2] and various physical methods, which reduce radiation damage include shielding, proper positioning and multileaf collimation.

Being a prosthodontist, actively involved in the treatment and rehabilitation of head and neck cancer patients, I can say that, with a whole array of prosthesis,[3] including radiation source carriers, perioral cone positioning stents, shielding stents, tissue recontouring stents, tissue bolus compensators, etc.; it is possible to limit the complications following RT. The use of a customized radiation shields/stents is recommended to maximize the protection of normal tissues, ensure appropriate delivery of radiation to proper location and depth, and allow reproducibility of the patient positioning for daily treatments.[4] The need for radiation stent is determined by the treating radiotherapist and radiation physicist who determine the dimensions of bolus and amount of shielding required. The prosthodontist then follows these specifications in the fabrication of the shield device.

Radiation stents typically incorporate a tissue-equivalent bolus material coupled with shielding. Lipowitz metal or cerrobend alloy is commonly used to shield uninvolved tissues from electron beams used in therapeutic radiation treatment of head and neck cancers.[5] This fusible eutectic alloy is composed of 50% Bi, 26.7% Pb, 13.3% Sn, and 10% Cd. Cerrobend alloy in a thickness of 1 cm can prevent the passage of up to 95% of 18 MeV radiation. Conventional facial moulage technique is commonly used to fabricate these stents. Recently, computer-aided designing/computer aided manufacturing (CAD/CAM) and rapid prototyping technologies have been utilized.[6]

At times, the head and neck surgeon and radiotherapist are not fully aware of the many primary and supportive services that the maxillofacial prosthodontist can perform through the use of the prosthesis. Keeping in mind Munshi's opinion that "treating cancer involves a multidisciplinary approach",[2] it is recommended that a maxillofacial prosthodontist should be a part of the head and neck cancer management team, so as to help the grieving patient in the best possible way.

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