

complete dental, periodontal, and radiographic exam, as well as careful review of patient risk factors, to detect teeth such as these that, if not removed, will place the patient at increased risk of ORN post-RT. Patients require significant education about the lifelong risk of ORN and strategies to mitigate risk, including the importance of good oral hygiene, in particular maintenance of periodontal condition, regular clinical and radiographic exams to detect any developing dental issues at an early stage, and the importance of avoiding dentoalveolar surgeries in the future. In some patients, for example, elderly patients with a limited prognosis, or patients with trismus complicating dental treatment, more limited evaluation protocols may be necessary. The reviewed studies provided conflicting evidence regarding a significant association between timing of pre-RT extractions and risk of ORN. In addition, the reported rates of ORN associated with pre-RT extraction were low (2%–3%). The panel recommends a 2-week period of healing, if oncologically safe, should be provided between date of dental extraction and start of RT to reduce the risk of ORN. However, the Panel strongly agreed that RT should not be delayed solely based on dental extractions when delay could compromise oncologic control. In situations where a patient does not have one to 2 weeks of healing available and presents with hopeless teeth within the planned radiation field, the Panel recommends removal.

In contrast, there is insufficient evidence to make a recommendation for the use of high-concentration fluoride gels or toothpastes to prevent the development of ORN. However, the Expert Panel strongly recommends use of high-concentration fluoride gels or toothpastes for the prevention of post-RT caries to reduce the need for future extractions that can place the patient at risk of ORN.

PREVENTION OF ORN AFTER RT

RT Plan Review to Inform Dental Treatment Plan

Literature Review and Analysis

No relevant randomized trials or cohort studies were identified by the systematic review. Therefore, recommendations are based on informal consensus.

Clinical Interpretation

Recommendations for interventions to prevent ORN in patients with a history of head and neck RT require personalized risk assessment based on the radiation dose and volume received by the mandible and/or maxilla at the site(s) of invasive dental intervention.

Communication between the radiation oncologist and dental specialist is essential to determine whether special precautions or alternative treatment plans are indicated based on radiation dose distribution and the location of planned dental extraction(s) or implant placement. Dental extractions and implant placement in areas of the mandible

(including grafted bone, ie, fibula or scapula mandibular reconstruction) or maxilla that received ≥ 50 Gy should be avoided to reduce risk of ORN if other therapeutic options are available. For patients undergoing reirradiation, review of the cumulative dose to mandible and maxilla on the plan sum should be evaluated when available. One should be cognizant that anterior mandibular sites may be at risk for development of ORN even if the high radiation dose was administered to only the posterior mandible, due to the uniaxial blood supply to the right and left mandible. Root canal, crown placement, or dental filling should be offered as noninvasive alternatives to dental extraction for problematic teeth in areas at high risk for ORN. Patients requiring dental extraction in a high-risk region due to recurrent infection, intractable pain, or other symptoms that cannot be alleviated without extraction should be monitored closely for healing with frequent irrigation of the surgical site(s). Additionally, patient education regarding abstinence from tobacco use and avoiding particle and debris collection is recommended. If patients lack options for restoring oral function aside from dental implants, then the benefit of dental implants may outweigh the increased risk of ORN due to improved QoL.

Perioperative Prophylactic Antibiotics

Literature Review and Analysis

No randomized trials were identified by the systematic review. One prospective cohort¹⁷ and one retrospective cohort study⁵⁸ utilizing different antibiotic regimens were identified. In the prospective study by Al-Bazie et al,¹⁷ 89 patients with a history of head and neck radiation dose >60 Gy underwent extraction of 232 teeth ($n = 78$ maxillary, $n = 154$ mandibular). Time range between prior RT and extraction ranged from 12 to 33 months (mean = 15 months). Patients received amoxicillin 500 mg once (or clindamycin 300 mg if allergic to penicillin) every 8 hours starting 10 days before the extraction through 7 days after the extraction. Patients also performed rinses with chlorhexidine gluconate 0.2% mouth washes every 12 hours for 10 days prior to extraction and 7 days after extraction. Patients received close follow-up with once weekly visits for 1 month after the procedure, then once monthly visits up to 6 months, then once every 3 months for 2 years. With a mean follow-up of 63 months, no ORN cases were reported. In the retrospective cohort study by Palma et al,⁵⁸ 49 patients with a history of 3D conformal head and neck RT underwent extraction of 107 teeth ($n = 58$ maxillary, $n = 49$ mandibular). All patients received clindamycin 300 mg once every 8 hours for 3 days prior to extraction and 7 days after extraction. Two of 49 patients (4.1%) developed ORN at sites of two adjacent mandibular tooth extractions (3.7% of extracted teeth).

Clinical Interpretation

To date, no randomized trials have evaluated periprocedural antibiotics in patients at risk for ORN. The prospective and