Oral Management Of Oncology Patients Requiring Radiotherapy

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Introduction
Surgery, chemotherapy and radiotherapy are the options for treatment of head and neck cancer. Each modality is associated with a number of considerations related to treatment of the cancer and quality of life of the patient.

Radiation therapy plays an important role in the treatment of patients with head and neck cancer. Depending on the location of the malignancy (primary tumor, lymph node metastasis), the salivary glands, oral mucosa, and jaws have to be inevitably included in the radiation treatment portals. The complications must be considered thoroughly so that every effort is undertaken to minimize the oral morbidity for these patients before, during and after cancer treatment and throughout the patient’s lifetime.

With over 1.4 million new cases of cancer diagnosed each year and a shift to outpatient management, dentists are more likely to see some of these patients in their practice; so they need to know about potential oral side effects. Preexisting or untreated oral disease can also complicate cancer treatment. Such complications can be prevented or at least better managed if dental and medical health care providers work together.

This paper offers the dental team an overview of the consequences associated with radiotherapy to facilitate collaboration with the patient’s medical team.

1. The role of pre-treatment oral care
A thorough oral evaluation by a knowledgeable dentist before cancer treatment begins is important to the success of the regimen. Pretreatment oral care achieves the following:

- Reduces the risk and severity of oral complications.
- Allows for prompt identification and treatment of existing infections or other problems.
- Improves the likelihood that the patient will successfully complete planned cancer treatment.
- Prevents, eliminates, or reduces oral pain.
- Minimizes oral infections that could lead to potentially serious systemic infections.
- Prevents or minimizes complications that compromise nutrition.
- Prevents or reduces later incidence of bone necrosis.
- Preserves or improves oral health.
- Provides an opportunity for patient education about oral hygiene during cancer therapy.
- Improves the quality of life.
- Decreases the cost of care.

With a pretreatment oral evaluation, the dental team can identify and treat problems such as infection, fractured teeth or restorations, or periodontal disease that could contribute to oral complications when cancer therapy begins. The evaluation also establishes baseline data for comparing the patient’s status in subsequent examinations.

Open communication with the patient’s oncologist is essential to ensure that each provider has the information necessary to deliver the best possible care.

1.1. Pretreatment oral evaluation
Ideally, a comprehensive oral evaluation should take place 1 month before cancer treatment starts to allow adequate time for recovery from any required invasive dental procedures. The pretreatment evaluation includes a thorough examination of hard and soft tissues, as well as appropriate radiographs (panoramic and CBCT) to detect possible sources of infection and pathology.

Also take the following steps before cancer treatment begins:

- Identify and treat existing infections, cavities and other compromised teeth, and tissue injury or trauma.
- Stabilize or eliminate potential sites of infection.
- Extract teeth in the radiation field that are nonrestorable or may pose a future problem to prevent later extraction-induced osteoradionecrosis.
- Conduct a prosthodontic evaluation if indicated. If a removable prosthesis is worn, make sure that it is clean and well adapted to the tissue. Instruct the patient not to wear the prosthesis during treatment, if possible, or at the least, not to wear it at night.
- Perform oral prophylaxis if indicated.
- Time oral surgery to allow at least 2 weeks for healing before radiation therapy begins. For patients receiving radiation treatment, this is the best time to consider surgical procedures.

Oral surgery should be performed at least 7 to 10 days before the patient receives myeloablative chemotherapy. Medical consultation is indicated before invasive procedures.

- Remove orthodontic bands and brackets if highly stomatotoxic chemotherapy is planned or if the appliance will be in the radiation field.
- Consider extracting highly mobile primary teeth in children and teeth that are expected to exfoliate during treatment.
- Prescribe an individualized oral hygiene regimen to minimize oral complications. Patients undergoing head and neck radiation therapy should be instructed on the use of supplemental fluoride.

Radiographic examination is essential in assessing the presence of abscesses, evaluation of peridontal status and determination of the existence of metastatic disease. Previous dental experience and exposure may also serve as a useful prognostic indicator.

1.2. Pre-radiotherapy extraction
The majority of patients who develop osteoradionecrosis (ORN) are those who were dentate just prior to the commencement of radiotherapy. Tooth removal accounts for the vast majority of trauma-related ORN, so all teeth located within the primary beam of the radiation portal should be closely scrutinized. Early consultation with the radiation oncologists and therapists is essential.

A number of factors influence the clinician’s decision as to which teeth need to be removed prior to the commencement of radiotherapy. These factors are still much controversy surrounding the extraction criteria for radiothera py patients, but the following need to be considered:

1.2.1. Non-dental factors
a. Radiation dose
If the radiation dose to the bone of the mandible and maxilla is less than 5000cGy, then according to the literature, there should be minimal risk of osteoradionecrosis after radiotherapy. The radiation oncologist must give this information to the dentist prior to the initiation of head and neck radiation.

b. Location of radiation ports
At some oral oncology clinics, recommendations for dental extractions prior to radiotherapy are limited to those areas of the mandible and maxilla that are going to receive a greater than 5000cGy. If there are teeth outside the potential high dose field of radiation, that are symptomatic or have a hopeless prognosis, they should be extracted prior to radiation, if time permits.

c. Patient prognosis
If the prognosis of the patient is extremely poor or if the tumor is growing rapidly, the radiation oncologist may decide that radiation needs to proceed without delay. After extraction, 2-3 weeks healing time is recommended before head and neck radia tion therapy begins.

d. Patient age
The younger the patient, the longer the teeth must be maintained disease free. If dental extractions are required (due to tooth decay or periodontal disease) in areas that will receive high dose radiation, the patient will be at significant risk for osteoradionecrosis. The risk of osteoradionecrosis in irradiated areas is present for the duration of the patient’s life. There is no “safe” time limit to wait for extractions or surgery.

Fig.1: Axial view
Fig.2: Right side
Fig.3: Left side
Fig.4: Lateral view
Fig.5: Cross sectional views

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Teeth that do not have contact with h. Unopposed teeth
... should be considered for pre-radiation therapy extraction if they have high dose field of radiation.

2. Management during treatment

It is extremely important to keep the mouth clean and healthy during head and neck radiation, to help reduce the risk of oral infection. A professional dental cleaning prior to radiation is highly recommended. Following are some suggestions for reducing oral complications during head and neck radiation.

Monitor the patient’s oral hygiene. Tooth brushing should be performed at least twice daily. Supersoft toothbrushes are available that will not irritate the gums.

• Advise against elective oral surgery as this may not be able to wear them again.

Monitor the patient for trismus: check for pain or weakness in masticating muscles in the radiation field. Instruct the patient to exercise these three times a day, opening and closing the mouth as far as possible without pain, repeat 20 times.

• Consult with the oncology team about use of dentures and other appliances after mucositis subsides. Patients with flabby tissues and xerostomia may not be able to wear them again.

• Watch for demineralization and caries. Lifelong, daily applications of fluoride gel are needed for patients with xerostomia.

• Advise against elective oral surgery on irradiated bone because of the risk of osteonecrosis. Tooth extraction, if unavoidable, should be conservative, using antibiotic coverage and possibly hyperbaric oxygen therapy.

4. Clinical Case 1

Post radiation osteoradionecrosis of the mandible (courtesy Pr. Marcel Noujeim).

The patient has a history of radiation therapy for oral cancer. A mandibular CBCT showed ill-defined, low density areas in the right and left mandibular molar regions (fig.1). On the right side, the area is extending from tooth #43 to distal of tooth #47 and occupying the superior half of the mandible (fig.2). On the left side, the area is extending from tooth #36 to tooth #34 and is also occupying the superior half of the mandible; some granular opacities are noted within the region of interest (fig.3). Both areas are associated with interruptions of the lingual and superior cortices. No root resorption could be detected on any of the involved teeth.

3. Clinical Case 2

Post radiation spontaneous mandibular fracture.

The patient complains from pain after extraction and curettage of the wound. The CBCT of the angle of the mandible shows an incomplete healing in the site of extraction, with ill-defined borders, discontinuity of the mandibular borders and bone sequestration (fig.4-6).

Conclusion

The clinical management of carcinomas of the head and neck region causes oral sequelae that can compromise patients’ quality of life and necessitate abandonment or reduction of optimal therapeutic regimes, which in turn reduces the odds of long-term survival. Such sequelae can be prevented or at best be managed if dental and medical health care providers work together. It is therefore essential that dentists have an understanding of cancer therapy and a sound working knowledge of the prevention and management options for the oral sequelae of cancer treatment.

The careful, thorough consideration of the complications of radiotherapy and chemotherapy must be considered so measures can be undertaken in every phase of treatment to alleviate undue patient discomfort and suffering. It is the responsibility of the general dental practitioner to help the patient navigate the minefield of the potentially devastating legacies of cancer therapy. So your oral health needs to be as good as possible before the start of treatment to avoid problems later.

References


Rest of references is available from the author.