Oral Management Of Oncology Patients Requiring Radiotherapy

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I ntroduction

Surgery, chemotherapy and radiotherapy are the options for treatment of head and neck cancers. 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 metastases), 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 every 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. Preventing 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 overall 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, carious 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 osteonecrosis.

• 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 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 myelo-suppressive 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 at the time of diagnosis 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. Tooth removal is recommended before head and neck radiation therapy. There is still much controversy surrounding the extraction criteria for radiotherapy 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 osteonecrosis 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 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 radiation 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 osteonecrosis. The risk of osteonecrosis 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.
Teeth that do not have contact with h. Unopposed teeth high dose radiotherapy. Of pain, sensitivity to percussion or g. Pain, apical radiolucency should be extracted prior to radia-
lars, that will be located in the pro-
Impacted teeth, especially third mo-
cal radiolucencies. Therefore, the patient needs to be informed of the potential life-long risk before radiation therapy is initiated, even if the teeth are very healthy.

1.2.2. Dental Factors

a. Radiographs
A panoramic radiograph should be taken prior to radiation therapy to assess health of the teeth and jaws. Patients without teeth should also have a panoramic film. Other intraoral ra-
diographs may be necessary, and even imaging techniques when justified.

b. Periodontal disease
Teeth in the proposed high dose field of radiation should be considered for pre-radiation therapy extraction if periodontal involvement, if they have a history of edentulous periodontitis, tooth mobility, bleeding, or inflammation of the gums.

c. Caries (tooth decay)
Teeth in the proposed high dose field of radiation should be considered for pre-radiation therapy extraction if they have deep decay, especially in a patient that has numerous areas of tooth decay throughout the oral cavity.

d. Root canals
Teeth having root canals in the pro-
persed high dose field of radiation should be considered for pre-radiation therapy extraction if they have silver fillings and/or evidence of root canal failure, i.e. pain, swelling or apical abscesses.

e. Impactions
Impacted teeth, especially third molars, will be located in the pro-
posed high dose field of radiation should be extracted prior to radia-
tion, if there is pathology associated with the teeth or if the teeth have a communication with the oral cavity. Large fillings, fractures, occlusal wear Teeth with large fillings, fractures or significant occlusal wear should be considered for extraction prior to receiving high dose radiotherapy.

f. Pulpal apical radiolucency
Tooth that are painful, have a history of pain, sensitivity to percussion or apical radiolucency should be consid-
ered for extraction prior to receiving high dose radiotherapy.

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 cause irritation. Flossing is recom-

3. Management after treatment
- Recall the patient for prophylaxis and home care evaluation every 4 to 8 weeks or as needed for the first 6 months after cancer treatment.
- Reinforce the importance of optimal oral hygiene.
- Monitor the patient for trismus: check for pain or weakness in masti-
cating muscles in the radiation field. Instruct the patient to exercise 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 ap-

4. Clinical Case 1
Post radiation osteoradionecrosis of the mandible (courtesy Dr. Marcel Noujaim). The patient has a history of radio-
therapy for the treatment of simultaneous carcinoma; he is currently undergo-
ing hyperbaric-oxygen therapy.