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 jaw have to be inevitably involved 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 pre-treatment 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, caries 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 myelo-suppressive chemotherapy. Medical consultation is indicated before invasive procedures.

- Remove orthodontic bands and brackets if highly stomatotoxic chemotherapy is planned or if the appliances 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 abcesses, evaluation of peridental status and determination of the existance 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. 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. 2. Location of radiation portal
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 5000Gy. 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.

3. 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.

4. 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 osteoradionecrosis in irradiated areas is present for the duration of the patient’s life. There is no “safeguard” time limit to wait for extractions or surgery.
A mandibular CBCT showed III de- fined, 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).

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.15

- Monitor the patient’s oral hygiene. Tooth brushing should be performed at least twice daily. Superfloss tooth-brushes* are available that will not cause irritation, Flossing is recommended as well as the use of a water-irrigating device, on a low setting, to eliminate food between teeth.
- Watch for mucositis and infection.Treating infections as soon as they are detected will help to reduce pain, as well as the spread of infection. A fungal, bacterial or viral culture is recommended if infection is suspected. Maintaining a self-care regimen may decrease the incidence of mucositis.1,4,9
- Advise against wearing removable appliances during treatment or left out at night.

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 masticating 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 appliances after mucositis subsides. Patients with friable 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.15

4. Clinical Case 1
Post radiation osteoradionecrosis of the mandible (courtesy Pr. Marcel Noueixm).

The patient has a history of radiotherapy for prostate cancer. Five years later, the patient developed severe pain in the mandible on the right side. Bone scan revealed a lesion involving the right mandible. Post radiation osteoradionecrosis of the mandible developed. Complex treatment was started with local antibiotics and radiation therapy, with good results.

References

Best of references is available from the author.

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