

Orodental Care related to Radiotherapy for Head and Neck Cancer

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ABSTRACT

Orodental care is mandatory in radiotherapy for head and neck cancer patients. Radiation therapy of malignant tumors of head and neck is associated with number of side effects, which can lead to acute and chronic oral complications. It is important to prevent and treat orofacial complications which require a multidisciplinary approach. All patients should undergo oral screening before radiotherapy for tumors of head and neck. Many oral conditions, such as poor oral hygiene, broken teeth, defective restorations and periodontal disease, are likely to precipitate complications during and after a course of radiation therapy and it is always better to deal with these problems before starting radiotherapy. The risk of osteoradionecrosis will be reduced to zero if there was a 21-day or greater interval between extraction and initiation of radiation therapy. Systematically applied oral hygiene protocols during radiotherapy may reduce the incidence, severity and duration of oral complications. It is well accepted that tooth extraction should be avoided even after many years of head and neck radiotherapy. If required it should be done by an experienced dental surgeon with proper prophylactic measures. The dental professional plays a relevant role in the prevention and healing or control of the oral complications. The relief of symptoms and the eradication of clinical manifestations largely improve patient quality of life.

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Head and neck cancers constitute a major proportion of regional malignancies in India. "Head and Neck Cancer" usually refers to neoplasms arising from below the skull base to the region of thoracic inlet.⁽¹⁾ The anatomy and physiology of this region are uniquely complex, and the function and appearance are critical to patient's self-image and quality of life. Most patients with head and neck squamous cell carcinoma are middle aged adult males in lower socio-economic classes who are chronic tobacco and alcohol consumers and have advanced tumors. These patients therefore tend to be less health conscious and to have less social support than most other cancer patients. Options for treatment of head and neck cancers are surgery, radiotherapy and chemotherapy.

Most head and neck cancer patients are treated with high-dose radiotherapy to large irradiation fields encompassing sensitive structures, including the oral cavity and surrounding structures. Radiation therapy of malignant tumors of head and neck is associated with number of side effects, which can lead to oral complications. The preservation of form and function of these structures are the key elements in over all management of head and neck cancer patients. It is Important to prevent and treat orofacial complications which require an multidisciplinary approach, that includes a dedicated team of radiation oncologist, head and neck surgeon, dentist, nurse, dietician, physical therapist, social worker and in some instances plastic surgeon, prosthodontist, and psychologist.

Radiation Induced Complications

Acute Complications

A therapeutic dose of radiation in head and neck cancer usually comprises a total of 64 Gy to 70 Gy in 32 to 35 fractions with daily dose of 1.8 to 2.0 Gy per fraction. Acute complications appear one to two weeks after starting the patient on radiation treatment. Oral mucositis, alteration or loss of taste (Dysgeusia), infection (bacterial, fungal & viral), change in salivary composition, periodontium pain are common acute complications which subside two to four weeks after completion of radiotherapy.(2)

Chronic Complications

The long-term effects are due to changes in the vascularity and cellularity of soft tissue and bone, damage to salivary glands and increased collagen synthesis, leading to hypovascularity, hypocellularity and hypoxia of the tissues. The common chronic complications are: xerostomia, dental alterations, rampant caries, demineralization, alteration or loss of taste (Dysgeusia), secondary opportunistic infections (e.g. candidiasis), oral ulceration (soft tissue necrosis), osteoradionecrosis, pain, temporomandibular disorders/trismus, nutritional deficiencies, psychosocial impact. To a significant degree, the oral problems associated with radiation therapy can be prevented or minimized through optimal management.(2)

Orodonal Care before Radiotherapy

A consultation with a dental team experienced in caring for patients undergoing treatment for head and neck cancer should be completed before the start of therapy. Establishment and maintenance of oral health, careful dental treatment planning is essential to minimize oral disease and possible adverse consequences. All patients should undergo oral screening before radiotherapy for tumors of head and neck.(1) The screening includes complete dental evaluation from dental surgeon with full description of the radiation treatment. The clinical examination should include extra oral features, particularly, lymph nodes, metastasis and mouth opening followed by comprehensive intraoral examination. This includes a record of dentition, presence of caries, periodontal disease, swelling fistula and oral hygiene. It is always beneficial to achieve a good level of oral hygiene before radiotherapy. In addition to the clinical examination, a thorough radiographic examination is crucial to determine the presence of inflammatory periapical abnormalities, periodontal status, other dental disease and tumour invasion of bone. A panoramic radiograph plus selective periapical or bitewing films (or both) should be done for preradiotherapy dental assessments.(3) Many oral conditions, such as poor oral hygiene, broken teeth, defective restorations and periodontal disease, are likely to precipitate complications during and after a course of radiation therapy. Dental and periodontal disease should be treated, oral infections should

be controlled prior to starting radiotherapy treatment in head and neck cancers.(4,5)

Criteria for Preradiotherapy Extractions

The criteria are: Caries (nonrestorable), active periapical disease (symptomatic teeth), moderate to severe periodontal disease, lack of opposing teeth, compromised hygiene, partial impaction or incomplete eruption, low dental awareness and lack of cooperation.(6) Pre-irradiation extractions, when performed and timed correctly, do not significantly increase the overall risk of osteoradionecrosis. Frequently suggested healing intervals ranged from 10 to 14 days. The risk is reduced to zero if there was a 21-day or greater interval between extraction and initiation of radiation therapy.(5,6) All major surgery should be performed 4-6 weeks in advance of start of radiotherapy.

Orodonal Care during Radiotherapy

Monitoring of the oral cavity should be increased during radiation therapy in an effort to decrease the severity of side effects. Systematically applied oral hygiene protocols may reduce the incidence, severity and duration of oral complications.(7) It is imperative that patients continue oral hygiene regimen throughout their course of cancer therapy.(8) The orofacial complications of cancer therapy depend mainly on the treatment modality used and to some extent also on host factors. For example, the severity of mucositis following oral radiation therapy depends upon, the type of radiation used, the rate at which it is delivered, the total dose given, individual response to the therapy and factors such as use of tobacco and alcohol products. Dietary control and topical fluoride therapy are essential and should be started on the first day of radiation therapy, continued for life or the duration of Xerostomia.(9) Maintenance of good oral hygiene- brushing 2 to 4 times daily with soft-bristled tooth brush and fluoride toothpaste or gel to help prevent plaque accumulation and demineralization or caries of the teeth; flossing daily is of great help.(9) Almost all patients undergoing head and neck radiation therapy experience confluent mucositis by approximately the third week of treatment. Maintaining a self-care regimen may decrease the incidence. The discomfort of mucositis is reduced with, coating agents, topical anesthetics, analgesics and systemic analgesics. In general, mucositis should be treated conservatively. Further tissue irritation and factors damaging epithelium, plaque control and oral hygiene should be maintained with tooth brushing, a soft bland diet, avoiding irritants such as tobacco, alcohol or spices. Maintenance of adequate hydration and nutrition is helpful. Jaw exercises (mechanotherapy) may limit the severity of trismus, but they will not mobilize fibrosis once it has occurred.(10-13) Health care providers are concerned about oral infections, preventing local and systemic infections in addition to managing oral symptoms. Treating infections as soon as they are detected is helpful to reduce pain as well as the spread of infection. A fungal, bacterial or viral culture is

recommended if infection is suspected. Frequent ingestion of small amounts of food (every 1-2 hours), ingestion of foods containing abundant calories and proteins is recommended. Stimulate appetite with light exercise, creative menus, avoidance of strong aromas.(14)

Orodonal Care Post Therapy

Interventions that may be beneficial following treatment include: clean teeth and gums after meals and before sleep with tooth brush or swab as tolerated; rinse the mouth with water regularly; if dentures are worn, remove and clean them daily and leave out while at rest; avoid painful stimuli such as hot food and drinks, spicy food, alcohol and smoking; regular inspection of mouth by the patient and health professionals; report any redness, tenderness or sores on the lips or in mouth; provide comfort measures such as lubrication of the lips, topical anesthesia and analgesics; prompt treatment of mucositis symptoms and oral infections. Long-term management and close follow up of patients after radiation therapy is mandatory. Continue to follow an oral health self-care regimen to keep the teeth and gums healthy, facilitate repair of any residual oral damage.(15) The patient should attend additional dietary counseling sessions. The referrals of patients to support groups are useful adjunct to patients' return to optimal functioning. Close follow-up will facilitate the management of any chronic complications that may occur. It is well accepted that tooth extraction should be avoided even after many years of head and neck radiotherapy and complete or removable dentures should be avoid for one year. Decreased local vascularization and its consequent radiation impaired healing capacity, particularly in the mandible, is the main cause of osteoradionecrosis. A higher incidence of osteoradionecrosis is observed after cumulative radiation doses to the bone exceed 65 Gy. Some studies have reported a two-fold increased risk of necrosis if teeth were extracted after radiotherapy compared with pre-irradiation therapy dental extractions.(15) Also, antibiotic coverage is strongly recommended. There is some evidence that hyperbaric oxygen treatment is more beneficial than conventional antibiotic prophylaxis in preventing osteoradionecrosis. Mechanotherapy for trismus, treatment of inflammations, mucositis and xerostomia should be undertaken promptly.(15)

Conclusion

The orodental care plays an important part in management of head and neck cancer patients. The complications of radiotherapy in head and neck cancers must be considered thoroughly-every effort is undertaken to minimize the oral morbidity before, during and after cancer treatment and throughout the patient's lifetime. The dental professional plays a relevant role in the prevention and healing or control of the oral complications. The relief of symptoms and the eradication of clinical manifestations largely improve patient quality of life.

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