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RESEARCH ARTICLE

GUIDELINES FOR SUPPORTIVE ORAL CARE IN CANCER THERAPY PATIENTS

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ABSTRACT

There are various treatment options for head and neck cancers consisting of surgery, chemotherapy and radiotherapy. Each of these are treatment options associated with a number of considerations related to treatment of the cancer and quality of life of the patient as they can affect one's oral health dramatically and can affect patients quality of life. The patient's oral care and function is an important contributor to post-treatment social adaptation and life quality. The oral and dental problems associated with radiation therapy can be prevented or minimized effectively through optimal management to a significant degree.

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INTRODUCTION

The oral cavity is a site where complications frequently develop either as a direct result of the malignancy or as an unwanted effect of the treatment (Systematic reviews of oral complications from cancer therapies, 2010). A pre radiotherapy consultation and assessment with an experienced dental team in caring for patients undergoing treatment for head and neck cancer should be completed before the start of therapy. Many oral conditions, such as poor oral hygiene, fractured teeth, faulty restorations and periodontal disease, these pathologies are frequent and a source of impairment of the patient's health and wellbeing (Worthington *et al*., 2011). In addition to good clinical examination, a proper radiographic examination is of vital importance to determine the presence of inflammatory periapical abnormalities, periodontal status, impacted teeth other dental disease and tumor invasion of bone. A panoramic radiograph in addition to selective periapical or bitewing radiograph (or both) is crucial for pre-radiotherapy oral and dental assessments. Consultation with the patient's radiotherapist or oncologist on the timing, nature (external beam radiotherapy or radioactive implant), features (location and size of treatment fields, radiotherapy fractionation and total dose) of the radiotherapy is essential for cumulative risk assessment and for planning of any required dental intervention. This article provides an overview of critical evaluation and guidelines of pre-radiotherapy, radiotherapy and post radiotherapy patients.

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Pre-treatment Assessment

Every pertinent oncology protocol should consist of an early pre-treatment oral and dental assessment. A member of the oncology team should be responsible for arranging the oral assessment and a permanent member of oral health staff is responsible for organizing oral care. Oral care should be seen as an innate part of total patient care and executed simultaneously with other priorities of oncology team (Shaw *et al*., 2000). Simple and easily applicable preventive advice should be given accentuating its value in maintaining oral comfort during therapy and after therapy.

Pre-RT dental treatment assessment and planning is obligatory to take into consideration:

1. The limited time to provide oral care to the patient, especially if the prognosis for survival is poor;
2. The increased risk of dental caries in the patient whose radiation field includes major salivary glands.
3. The risk of osteoradionecrosis

An overarching oral assessment should be undertaken to eliminate oral foci, existing diseases before the start of cancer therapy. It will aid in establishing an adequate standard of oral hygiene to meet the increased challenge and complications of cancer therapy. Preventive care and rehabilitation must be

provided to the patient in addition to multidisciplinary collaboration within the cancer centre to alleviate oral symptoms and sequelae before, during and after cancer therapy.

This model also take into consideration malignancy risk factors (MRF). High malignancy risk factors include radiation dose > 55 Gy, a radiation field that includes molars, teeth that are near the tumor, and if radiotherapy begins in fewer than 14 days.

Pre-radiotherapy-Component of care

Pre-Radiotherapy	
Diagnosis	Site, size and type
Medical history	Prior cancer history, risk factors, any other disease
Dental History	Past and, previous dental visit present dental care,
Oral hygeine practices	Brushing technique, non-alcohol based mouthwashes
Complete oral examination	Plaque, calculus, local factors
Oral hygeine status	Non cariogenic diet
Diet	Supplementation of fluoride-varnish, gels
Fluoride	If < 55mm,moth opening excercises, sugar fee chewing gums
Mouth opening	Resting (> 0.1 mL/minute), stimulated (> 1.0 mL/minute)
Whole salivary flow rates	Periodontal surgery if necessary and indicated can be performed, teeth with furcation involvement, teeth
Periodontal condition	with >6mm clinical attachment level should be adequately assessed
Carious teeth	Carious teeth should be restored, Deep caious teeth ,root caries should be assesed carefully
Restored teeth	Overhanging or impinging margins should be checked
Non vital/vital teeth	Non vital asymptomatic teeth should be endodontically treated
Mobility	Grade of mobility should be assessed
Impacted /partially impacted teeth	Partially/fully impacted teeth with with pericoronal abscess should be assessed
Examination of prosthesis	Patient is advised better not to wear the prosthesis during cancer therapy ,or at least not to wear at night
Orthodontic treatment	(http://www.nidcr.nih.gov/OralHealth/Topics/CancerTreatment/OralComplicationsCancerOncology.htm)
Radiographic examination	Should be discontinued
Prognosis	Carious teeth, Periapical lesion, Impacted teeth
Oncologist	Cure or paliation
Radiotherapy	Site, dose duration

Dental conditions associated with high risk dental risk factors (DRF) include

1.	Teeth with primary and secondary deep caries
2.	Root caries > ½ the root circumference
3.	Pulpal disease and periapical disease (nonvital pulps and no previous RCT),
4.	Periapical osteitis > 3 mm;
5.	Internal/external root resorption;
6.	Probing depth or gingival recession > 6 mm.
7.	Furcation involvement
8.	Mobility > 2 mm,
9.	Partially impacted teeth and residual root tips,
10.	Poor oral hygiene and low dental awareness or lack of cooperation.

Acute phase of therapy-Component of care

Maintenance of oral hygiene	Oral hygiene instruction reinforcement with soft brush, alcohol free chlorhexidine mouthwash self-applications of fluoride, either neutral NaF 1 percent gel applied at least every other day46,50 in custom-made fluoride carriers or NaF 3 percent toothpaste twice per day. (Jansma *et al*., 1989) The daily use of 4 percent stannous fluoride also is effective (Fleming, 1983)
Fluoride application	
Saline rinses	
Prosthesis	
Prophylaxis/treatment of candidal infection	Avoided wherever possible, frequent attention and adjustment,
Mucositis prevention /treatment	Antifungal therapy, Clotrimazole 10 mg troches administered five times per day are effective in treating mild to moderate cases oral hygeine instruction, avoidance of cigratte and alcohol, use of mucosal coating agents, rinsing with 2% morrphine, (Lalla *et al*., 2014) silicone mouthguards in special cases proper hydration, use of humidifiers, pharmacological agents-pilocarpine, cevamaline
Xerostomia & hyposalivation prevention /treatment	
Dysphagia	
Trismus	Jaw opening exercises, tongue blades, Bite opening appliance

Teeth under high risk category or with poor prognosis should be removed no less than ten days prior to cancer therapy. (Clayman, 1997) Decision regarding extraction of teeth. Dental treatment planning models have been proposed in which decisions are based on both dental and cancer therapy conditions (Bruins *et al*., 1999; Schiodt and Hermund, 2002) In Schiodt's model, (Schiodt and Hermund, 2002)

This decision-making model recommend that teeth falling under high MRF and high DRF should be extracted (Bruins *et al*., 1999). Moreover, decision regarding extraction should contemplate the strategic value of the teeth, potential impact of trismus and limited mouth opening on oral hygiene and dental treatment, taurodontism, and root anatomy the overall motivation of the patient, and the risk associated with removal of teeth. (Bruins *et al*., 1999)

Zlotolow (1999) suggested that the dentist consider following factors when determining whether or not to extract teeth

- An optimal recovery time after teeth extraction is 14 -21 days
- Bone remodeling may occur after rt;
- Mandible is more prone to osteoradionecrosis
- Primary wound closure and alveolectomy may be needed to decrease healing time;
- Nonvital asymptomatic teeth in the field can be endodontically treated.

The decision to extract teeth before RT should consider

- Teeth that are or close to a high-dose radiation field. Such teeth are non-restorable or may require significant restorative, periodontal, endodontic, or orthodontic intervention.
- Patients with moderate to severe periodontal disease (pocket depths > 5-6 mm) or with advanced recession.

The dentist may develop a more belligerent dental treatment plan for the patient with poor motivation or cooperation, low dental perception, a poor history of regular dental care treatment, poor oral hygiene, and evidence of past dental/periodontal disease.

Acute phase of therapy

The Oncology Team must include a dental hygienist responsible for the patient's oral care. The dental hygienist is responsible to the designated member of dental staff. The designated member of dental staff is responsible for arranging or carrying out any active dental treatment required. Dental treatment is circumvented wherever possible during therapy.

Post-radiotherapy-Component of care

Complete dental work that was deferred during therapy	Carried out with extreme precautions.
Oral hygiene maintenance	High standard of oral hygiene maintanence
Restorations	simple ensuring acceptable aesthetics and function
Viral infections eg herpes labialis	Acyclovir and other antiviral drugs
Uncontrolled periodontal disease	Vigorous treatment is advised
Orthodontic treatment	can be start once the patient has been free of cancer for one year. Where extensive root damage/lack of root development has occurred, vital consideration must be given to not providing treatment.
Dentures	Bisphosphonate treatment is not a definitive contraindication to it.
Dental extractions	Frequent attention and adjustment avoided wherever possible
Rehabilitation with dental im-plants	If essential, must be carried out with appropriate and strict precautions. a higher failure rate in patients previously treated with RT, wait at least 12 months after RT (Claudy *et al*., 2015), although some recommended at least 2 years
Osteoradionecrosis	Oral trauma reduction, Paliative measure, antioxidant medication, antibiotics, hyperbaric oxygen therapy (13)surgical excision
Follow up and recall	

Following Cancer Therapy – Prevention and Monitoring

The oncology discharge protocol includes a procedure for ensuring continuing oral care. The designated member of dental staff is responsible for organizing and monitoring appropriate continuing oral care. After discharge patients should be re-evaluated and motivated for a punctilious and effective oral hygiene maintenance. Growth and development should be intimately monitored. Children should be review at least every six months. For patients with xerostomia, trismus, mucositis a three month review is advised. Regular and well judged oral healthcare monitoring should be provided with the help of regular radiographs and preventive therapies. Strategies for dealing with xerostomia should be continued. Fluoride supplements appropriate to age should be used. Chlorhexidine gel can be applied with applicators every three months. In patients of trismus, jaw exercises are executed.

Conclusion

Dental assessment and treatment of cancer patient decisions require judicious understanding and a prudent treatment plan based on stage of cancer, prognosis, time, duration, site and dose of therapy, patient impression, knowledge, attitude and complications of treatment. Dental health professional can wisely prepare the patient prior to therapy and can also provide good supportive care during and after therapy. He can well prevent or at least reduce post therapy complications by his sensible approach by proper assessment and planning. Management of radiation induced xerostomia, osteoradionecrosis and other oral complications are the dental health team's liability. Workshops and programme should be organized in collaboration with oncologists to train practioners about scientific rationale and recommendations. They should also participate actively for the betterment of their patient.

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