

Oral Manifestations of Cancer Therapies: Advice for the Medical Team

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ABSTRACT

Cancer therapies often affect many portions of the body through the course of treatment. Chemotherapy and radiation treatments within the head and neck can profoundly affect the oral cavity. Oral complications of these therapies include oral mucositis, xerostomia, and dental caries, among others. Clinical management of these conditions includes preventive care as well as palliative care. Insightful recommendations will be discussed to increase clinician confidence when caring for oncology patients. Interprofessional collaboration can increase knowledge as well as treatment outcomes for this patient population.

Keywords: oncology, oral candidiasis, oral mucositis, oral xerostomia, palliative care, radiation caries

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Oral complications from systemic disease and medical treatments may be traditionally addressed by dental providers, but nurse practitioners should be prepared to diagnose and respond to these conditions. Oncology nurse practitioners as well as those in primary care are in a unique position to identify oral complications from cancer therapy and provide simple, evidence-based treatments for the patient. Oral complications from cancer treatments may go unnoticed unless oral assessment is included as a standard protocol. In this article, a variety of treatment options are addressed after a brief review of the oral complications from cancer treatment. The recommendations provided in this article are from the expert viewpoint of dental hygienists, with practical application for health care providers.

PREVENTION OF ORAL COMPLICATIONS FROM CANCER THERAPIES

Although it may be common knowledge that oral complications can develop during and after cancer treatment, implementing prevention techniques before cancer treatments begin can result in improved outcomes for the patient. At least 2 weeks before initiating cancer therapy, it is imperative that the patient undergoes a thorough periodontal and dental assessment to identify any preexisting oral concerns such as gingival infection, dental disease, or any fractured teeth that could potentially contribute to

oral complications once the oncology treatment has begun.¹

Additionally, cryotherapy can be implemented with ice chips or ice water that is held in the patient's mouth during the chemotherapy session to reduce the incidence of developing oral mucositis.² This causes vasoconstriction and decreases the oral mucous membranes' exposure to the toxic medications.² Another technique for the prevention of oral mucositis is the use of low-level laser therapy.² Low-level laser therapy can also be used to treat oral mucositis once it develops.²

MANAGEMENT OF ORAL COMPLICATIONS FROM CANCER THERAPIES

A reference of the oral complications of cancer therapies along with recommended strategies to provide relief for symptoms can be found in the [Table](#). Several of these components can be added to the daily regimen of oncology patients. Medical professionals can share their knowledge of these products and techniques to increase patient compliance.

Once treatment has begun, the patient should be instructed to brush after eating. The toothbrush should ideally have extra-soft bristles to increase gingival comfort. These toothbrushes might be labeled as postoperative or sensitive brushes. Hospitalized patients may require assistance with brushing at this time because medical equipment attached to

Table. Management of the Oral Side Effects from Cancer Therapies^{2,3,5-7}

Oral Complication	Description	Derived from		Management	Products
		Chemotherapy	Radiation Therapy		
Oral mucositis	Tissue irritation from damage to basal cells of oral epithelium; begins approximately 10 days after treatment initiation; tissue may appear edematous and erythematous with painful ulcers	X	X	Cryotherapy during chemotherapy sessions and low-level laser therapy; rinsing with solution made from 1/4 tsp baking soda, 1/4 tsp salt, and 16 oz warm water 1-3 times daily for 7 days; extra-soft brush; avoid mouthrinse containing alcohol; bland diet avoiding foods with sharp edges, liquid meal replacement	Rx: alcohol-free antimicrobial mouthrinse, such as GUM 0.12% chlorhexidine gluconate (Sunstar); 0.15% benzydamine hydrochloride rinse OTC antimicrobial mouthrinse: Listerine Zero, Crest Pro-Health OTC anesthetic mouthrinse: mix equal parts of alcohol-free liquid diphenhydramine and liquid antacid and swish for 30 seconds and expectorate every 90 minutes; UlcerEase (Del Ray Dermatologicals, Johnson City, TN); Rincinol
Xerostomia	Dry mouth resulting from reduced or absent salivary flow; increased risk for caries, periodontal disease, and <i>Candida</i> –related infections; affects eating and speech	Temporary effect	Permanent effect if radiation is focused on the head and neck region	Frequent sips of water; saliva substitutes; avoid dental products containing sodium laurel sulfate; sleeping with a humidifier in the room; chewing 3-8 pieces per day of sugar-free gum containing xylitol; fluoride rinses/gels; avoid sugar, tobacco, alcohol, and foods that are spicy and salty	Rx: Caphosol rinse (Jazz Pharmaceuticals, Palo Alto, CA); 1.1% sodium fluoride gel, such as PreviDent 5000 (Colgate-Palmolive, Morristown, NJ); pilocarpine for increased salivary flow OTC saliva substitutes and lubricants: Biotene products (GlaxoSmithKline), such as moisturizing gel, mouthrinse, toothpaste, gum; OraMoist patch (Quantum Health); Oasis mouthrinse (Gebauer Consumer Healthcare, Cleveland, OH)
Candidiasis	Fungal infection	X	X	Disinfect acrylic appliances with 1 part bleach and 9 parts water for 10 minutes; disinfect appliances with metal in 0.12% chlorhexidine gluconate rinse for 10 minutes	Rx: nystatin and fluconazole
Dysgeusia	Change in taste	X	May be permanent	Resolves after treatment	

continued

Table. (continued)

Oral Complication	Description	Derived from Chemotherapy	Derived from Radiation Therapy	Management	Products
Trismus	Difficulty opening the mouth; occurs 3-6 months after head and neck radiation treatments		X	Exercises to increase the opening of the mouth, such as using tongue depressors stacked incrementally to increase the opening between the teeth; moist heat; NSAIDs	
Radiation caries	Caries found at the cervical margin or incisal/cuspal areas of tooth from xerostomia and plaque		X	Daily use of prescription strength fluoride gel in trays made by a dental professional; professionally applied 5% sodium fluoride varnish	Rx: 1.1% sodium fluoride gel or paste, such as PreviDent 5000
Neurotoxicity	Nerve tissue damage; bilateral, throbbing pain in the mandible	X			
Increased bleeding		X		If the platelet count is <20,000, discontinue mechanical oral hygiene at home; use alcohol-free mouthrinse as a substitute for brushing and flossing	

NSAIDs = nonsteroidal anti-inflammatory drugs.

the patient's body can prevent proper arm movement during brushing.³ Regardless of who is providing the oral care, it should be done using very light pressure in small circles to remove plaque and bacteria from the teeth. Any tissue trauma can create a conduit that will allow bacteria into the bloodstream that could ultimately lead to more harm through induction of a bacteremia.⁴ Running the bristles of the brush under warm water before brushing can soften the bristles, making it more comfortable for the patient.⁵ It is also essential that the patient's tongue is brushed because it harbors high quantities of organisms that can lead to oral infections.

There are times when it is too painful to brush and floss. Mouthrinses can be helpful in removing debris, lubricating oral tissues, soothing sore tissues, reducing the number of disease-producing organisms, and preventing dental caries.⁶ Different options are available and should be chosen based on a review of

the patient's medical history, the oral conditions, and patient preferences. One option is to create your own soothing rinse from baking soda, salt, and water.⁵ Sodium bicarbonate can reduce the acidity of oral fluids and discourage yeast colonization, resulting in a decreased risk for developing candidiasis.² This rinse should only be considered in patients who do not have sodium restrictions.⁵ There are alcohol-free mouthrinses available for purchase either over the counter (OTC) or through prescription. Alcohol-based mouthrinses can irritate the oral mucous membranes and can be uncomfortable to use during cancer therapy.⁵ The best OTC options combine alcohol-free formulas with antimicrobial agents to reduce the number of disease-producing organisms. Chlorhexidine gluconate is an antimicrobial agent that is available as a prescription rinse. It can be administered either as a full-strength rinse or applied directly to the teeth on the bristles of a toothbrush.⁷ It also

comes as an alcohol-free formulation; however, not all pharmacies carry this form of the rinse. Pain can be reduced by rinsing with an anesthetic mouthrinse before implementing oral care. OTC rinses include Rincinol (Sunstar, Chicago, IL) or a mixture of equal parts of liquid diphenhydramine and liquid antacid. Benzylamine hydrochloride is a nonsteroidal anti-inflammatory drug that can be prescribed as an oral rinse to provide pain relief from oral mucositis.² It should be used undiluted but can be diluted if tissues are too sensitive.

The proper care for dental appliances is also important for the comfort and health of an oncology patient. Appliances, such as a denture or retainer, should be removed at least once a day with a preference of keeping the appliance out during periods of rest.⁵ This time will allow the tissue underneath the appliance to receive oxygen while also giving the patient time to clean the appliance. Bacterium and fungi can grow on these appliances, and if not cleaned, they can accumulate and cause inflammation. Appliances can be soaked in a solution of 1 part sodium hypochlorite and 9 parts water if they do not contain any metal. Metal-containing appliances can be soaked in 0.12% chlorhexidine gluconate rinse or a retail denture-cleansing product. A dental professional should ensure that the appliance fits the patient correctly in order to prevent trauma within the oral cavity.⁸

When radiation therapy is targeted to the head and neck, permanent damage can affect the salivary glands.⁶ Xerostomia develops when salivary flow is diminished. Xerostomia contributes to the formation of dental caries and gingivitis. Although organisms are ultimately responsible for the initiation of dental caries and gingivitis, a dry environment provides the perfect condition for uncontrolled growth and difficulty removing plaque. In addition to thorough brushing, fluoride therapy can reduce the incidence of caries and provide relief of tooth sensitivity if used on a daily basis.⁹ Sodium fluoride and stannous fluoride varieties are available in OTC and prescription formulations. Daily use of fluoride rinse or gel provides optimal results. Additional strategies to improve xerostomia and reduce the risk of developing dental caries and gingivitis are reviewed in [Table](#).

CASE STUDY

A 68-year-old white man received routine dental hygiene treatment at a university-based dental hygiene clinic in April 2013. He was taking antihistamines and experiencing severe gingival tenderness, bleeding, and oral ulcers. The patient had been under the care of an oncologist since April 2006 for B-cell chronic lymphocytic leukemia. Chemotherapy using fludarabine and rituximab was completed in October 2012, but he was not in remission at the time of this appointment.

This patient had previously been instructed on a proper oral care regimen and performed oral care daily despite the pain that it caused. He brushed his teeth at least twice a day with an extra-soft bristled toothbrush and flossed 1 to 3 times a day.

Gingival tissues displayed plaque-induced generalized severe gingivitis and localized moderate and severe chronic periodontitis that was exacerbated by chronic aggressive leukemia and the patient's inability to remove the periodontal pathogens on a daily basis through home care techniques. Bleeding sites were noted on each surface of each tooth, indicating generalized inflammation and active disease.

Oral candidiasis was identified on the hard and soft palates as well as the buccal mucosa because the patient was immunocompromised from chronic leukemia. Additional findings include a 4 × 4 mm ulcer on the apex of his tongue, edema within the tongue tissue, and a 2 × 2 mm ulcer on the lower lip.

MANAGEMENT

Consultation with a dental provider is always an option; however, the following recommendations will provide immediate assistance to this patient. An additional oral care product should be introduced to reduce the microbial challenge faced by this patient. Because of the severity of the periodontal disease, 0.12% chlorhexidine gluconate rinse was prescribed and recommended twice each day. The chlorhexidine gluconate rinse had dual benefits for this patient, controlling both the microbial challenge that caused periodontal disease as well as oral candidiasis. If the patient cannot afford a prescription rinse, OTC options include Listerine Zero (Johnson & Johnson, Morris Plains, NJ) and

Crest Pro-Health (Procter & Gamble). A prescription antifungal regimen of 10 mg Mycelex Troches (Alza in Mountain View, CA) 5 times daily for 2 weeks can be prescribed for his extensive oral candidiasis.

Irritation within the oral cavity made it uncomfortable to eat. The patient was encouraged to drink Ensure (Abbott Nutrition, US) in place of eating 1 meal each day. During other times, avoidance of foods with sharp edges, spicy foods, caffeine, and alcoholic drinks was recommended. Oral moisturizing techniques, such as frequent sips of water, sugarless gum, and saliva stimulators including pilocarpine, were also suggested because xerostomia was evident. Although there were several recommendations made during the appointment, the patient was receptive and willing to incorporate these suggestions to improve the health of his mouth and his comfort.

CONCLUSION

This case highlights several of the common oral manifestations of cancer treatment and provides a beautiful illustration of the way clinician recommendations can improve palliative care and provide a healthier oral environment. Strategies can be individualized depending on the symptoms and patient needs. Although some strategies may not have sufficient evidence to support their effectiveness, individual results may vary. Never underestimate the impact you can make on the quality of life through a simple oral screening and education shared with your oncology patients. **JNP**

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