Dental Management of the Oncology Patient
Prevention, Recognition, and Intervention
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Objectives
- Assess oral/dental needs prior to cancer treatment
- Recognize oral/dental complications as a result of cancer treatment
- Manage common oral/dental complications as a result of cancer treatment
- Advise patients on simple techniques to prevent complications from cancer treatment

Head & Neck Cancer Diagnosis:
Pretreatment Considerations
- Current and Updated Med Hx, Rx Hx, Family/Social Hx
- Updated radiographs and intra-oral and extra-oral exams
- Consultations
  - PCP
  - Oncologist
- Interdisciplinary
  - PT/OT
  - Nutrition
  - Social Work
  - Nursing
  - Psychology
Head and Neck Cancer: Surgery

- Functional Deficits
  - Soft and hard tissue
- Remaining teeth
  - Functional pairs
- Restriction in movement
  - Eating/Drinking
  - Speaking/phonation
  - Self care
  - Prosthesis
- Esthetics
  - Smiling/Social Interaction

Head and Neck Cancer: Chemotherapy

- Immunosuppression: Drug Nadir
- Direct harm to oral tissues
- Indirect harm to oral tissues

Chemotherapy: What the dentist knows

- Is given orally, IV, by injection (SQ, IM, IL), or topically
  - cycles depending on the treatment goals (type of cancer, how your body responds, how well you body recovers, etc.)
- Affects all rapidly dividing cells
  - Many side effects in all body systems
- Oral complications from direct damage to oral tissues secondary to chemotherapy and indirect damage due to regional or systemic toxicity
  - Frequency and severity related to systemic immune compromise, i.e. myelosuppression, immunosuppressed
Chemotherapy: Pre-Therapy

- Referral from Physician for consult
  - Another provider from interprofessional team
- Thorough Medical history including medications
- Obtain plan of therapy, which drugs, amount, duration
  - Determine timing of myelosuppression
- Complete comprehensive dental exam, radiographs, and treatment planning

Chemotherapy: Dental Treatment

- Complete all invasive treatment 10-14 days prior to chemotherapy
- Avoid periodontal and endodontic surgery
  - Any surgery with active soft tissue disease--extract
- Fabricate fluoride trays, provide fluoride Rx
- Instruction on diet, hydration, oral hygiene
- Educate on signs/symptoms of disease

Chemotherapy: During

- Weekly checks
- Monitor oral hygiene
  - Reinforce techniques
- Monitor myelosuppression
- Monitor salivary flow
  - Salivary substitutes
  - Salivary stimulation
- Address problems at first sign
  - Mucositis/stomatitis
  - Candidiasis
  - Cheilosis/cheilitis
  - Caries
- Supportive
  - Encouragement
Chemotherapy: After

- Allow tissues to heal when chemotherapy completed
  - This varies with the drug(s) used
- May return to pre-chemotherapy recall interval
- Treatment plan and provide dental treatment per pre-chemotherapy

Common Side Effects: Oral

- Mucositis (ulcerative)
- Reactivation of HSV
- Dysgeusia
- Dysphagia
- Infections
  - Fungal
  - Periodontium
  - periapices
- Neuropathies
- Salivary gland dysfunction/toxicity
  - Xerostomia

Special Case: MRONJ

- Medication Related Osteonecrosis of Jaw
  - Former ARONJ and BRONJ
- AAOMS special committee position paper
- Clinical Definition
  - Stages
  - With or without bone exposure
  - Emerging Imaging
Head and Neck Cancer: Radiation Therapy: What the dentist knows

- Goal is to kill cancer cells
- Measured in Gray (Gy) units of absorbed radiation: 1 Gy = 100 cGy = 100 rad
- Can be used alone or combined with surgery and/or chemotherapy
- Dependent on tumor tissue/type
- Average of 200 cGy daily for 5 consecutive days with two days of rest
- Total cumulative dose ranges from 5000 cGy to 8000 cGy for advanced tumors
- Threshold of permanent destruction is 2100-4000 cGy

Radiation Therapy

- Image Guided (IGRT)
  - Movable tissues
- Intensity Modulated (IMRT)
  - Head and Neck

- Dose
- Direct
- Indirect

Common Side Effects: Oral

- Mucositis and Dermatitis
- Dysphagia
- Dysgeusia
- Trismus
- Osteo- and soft tissue necrosis
- Xerostomia
  - Fungal infections
  - Radiation Caries
**Tissue Changes**

- Irradiated tissue becomes hypocellular, hypovascular, and hypoxic resulting in fibrosis and vascular occlusion
- The destruction is mostly permanent
  - Irradiated tissue does not re-vascularize with time
- As a result, irradiated tissue does not heal well after injury
  - Maxilla vs mandible

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**Radiation: Pre-Therapy**

- Referral from Physician for consult
- Thorough Medical history including medications
- Obtain plan of (surgery and) radiation including field(s), amount, duration
- Complete dental exam, radiographs, and treatment planning
- Consider use of Amifostine as a radiation protective agent

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**Radiation: Dental Treatment**

- Complete all invasive treatment 10-14 days prior to radiation
- When in doubt -> extract
- Fabricate fluoride trays, provide Rx
  - Use cotton-tipped applicators if needed
- Instruction on diet, hydration, oral hygiene
- Instruct on exercises using tongue depressors
  - For trismus
  - Commercially available devices as well
- Educate on signs/symptoms of disease
Radiation: During

- Weekly checks
- Monitor oral hygiene
  - Reinforce techniques
- Monitor muscle trismus
- Monitor salivary flow
  - Salivary substitutes
  - Salivary stimulation
- Address problems at first sign
  - Mucositis/stomatitis
  - Candidiasis
  - Cheilosis/cheilitis
  - Caries
- Supportive
  - Encouragement

Radiation: After

- Place Patient on 3 month recall or less
- Avoid any invasive therapy if at all possible
  - Tissues will not heal as quickly
  - Wait at least 6 mos prior to construction of removable prosthesis
- Continue
  - Fluoride trays
  - Supportive salivary therapy
  - Monitor for fungal infections
  - Monitor for bacterial infections

Main Points

Head and Neck Radiation

- Salivary gland destruction in path of radiation is permanent
- Aggressive dentistry pre-therapy
- Aggressive prevention during and post-therapy (indefinitely) to decrease susceptibility to ONJ

Chemotherapy

- Salivary glands are affected but they will rebound after therapy
- Aggressive dentistry pre-therapy
- Focus on time during therapy with aggressive prevention
Functions of Saliva

- Lubricates
  - Serous and mucinous components
- Neutralizes
  - Near neutral pH
- Dilutes
  - Tastants to taste pores
- Flushes
  - Flushes oral cavity
- Begins Digestion
  - Aids in bolus formation for swallowing
- Re-mineralize
  - Minerals
- Anti-microbial
  - Lactoferrin
  - Peroxidase

Major Salivary Glands

- Parotid
  - One on each side of face with the intra-oral orifice opposite the upper molars
- Submandibular
  - One on either side of midline under the jaw with the intra-oral orifices in the floor of mouth under the tongue
- Sublingual

When there is not Enough

- Too little saliva can significantly alter a person’s quality of life and the morbidity associated with multiple systemic conditions
  - How little is too little?
Salivary Gland Hypofunction: Xerostomia

- Commonly referred to as “dry mouth”
- Diminished salivary flow rate, typically accepted as a 50% decrease in the clinically determined rate in healthy individuals not taking medications
  - Resting Flow Rate 0.3-0.4 ml/min
  - Resting flow rate represents the basal rate present for about 14-16 hours of the day and important for oral comfort and protection
  - Stimulated Flow Rate 1-2 ml/min
  - Stimulated flow rate represents the functional capacity of the gland and is important for swallowing and oral clearance, present for about 2 hours of the day

Objective vs Subjective

- Objective
  - Major gland secretions
    - Resting flow rate
      - with a Carlson-Crittenden Cup
  - Minor gland secretions
  - Whole saliva
    - Stimulated flow rate
      - with citric acid, wax

- Subjective
  - Complaints of dry mouth
  - Questionnaire
  - Thirst
  - The “cracker” test
    - Ability to chew and swallow one cracker with nothing to drink

Carlson-Crittenden Cup
Clinical Signs/Symptoms of Xerostomia

- Dryness of mucous membranes
- Tongue fissuring and lobulation
- Inflammation/cracking corners of mouth
- Thrush
- Denture sores
- “Ring around the collar” cavities
- Thick, ropey saliva
- Difficulty swallowing
- Difficulty with taste
- Difficulty eating/speaking/wearing prosthesis
- Swelling of the salivary glands
- Difficulty expressing saliva
- Cheek biting
- Persistent need for fluids

“Ring Around the Collar” Caries

Denture Sores
Mouth Pain/Inflammation

Fissured/Lobulated Tongue

Management of Salivary Dysfunction

- Visit the dentist regularly
- Address problems when they first appear
- Meticulous oral hygiene
- Stay well-nourished and well-hydrated
- Keep an updated list of all medications you are taking (Rx, OTC, herbal, regularly or not)
- Update your medical, social, and diet histories often
- Keep in communication with your physicians, dentists, and other health care providers
Oral Hygiene

- Rinse/wipe oral cavity and associated structures after every meal
- Rinse/wipe any removable prosthesis
  - Denture brush
  - Remove at night and between meals
  - Anti-fungal soak
- Mechanical plaque removal
  - Soft toothbrushes
  - Moist gauze
  - Toothettes good for soft tissue cleansing
  - Use mild toothpaste and avoid alcohol-containing products
- Interdental Aids
  - Floss
  - Proxy brush
  - Stimudents

Oral Hygiene Aids

Pain and Inflammation

- Rinses
- Coating Agents
- Analgesics
Pain/Inflammation: Rinses

- **Goals**
  - Cleanse
  - Moisturize
  - Lubricate

- **Preparations**
  - Salt and soda (1/2 tsp each in 8 oz warm water) every 2 hours
  - Salt or soda (1 tsp one or other in 8 oz warm water) every 2 hours
  - Hydrogen peroxide diluted 1:1 in water or saline; 1-2 days maximum
    - Particularly useful to debride ulcerated/crusted area
  - **OTC/Rx**
    - Other commercial non-alcohol containing rinses

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Pain/Inflammation: Coating Agents

- **Goals**
  - Sustained moisturizing and lubricating

- **Water soluble lubricating jelly**

- **Topical Anesthetics**
  - Coating

- **Home preps: local anesthetic with**
  - Milk of magnesia
  - Kaolin with pectin suspension
  - Example: Benadryl 12.5mg/5ml kaopectate

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Pain/Inflammation: Analgesics

- **Topical Analgesics**
  - Lidocaine 2% viscous

- **Systemic Analgesics**
  - Ibuprofen
  - **Opioids (Narcotics)**
    - Be aware of agents that cause GI distress and alter hemostasis
Infection

- **Antifungals**
  - Nystatin 100,000 units/ml
  - Clotrimazole troches 10mg
    - May have trouble dissolving in xerostomic mouth
    - When a removable prosthesis is worn, be sure to treat it as well: dilute bleach solution works well
- **Steroids**
  - Triamcinolone 0.5%
  - Temovate 0.05%
- **Antibiotics**
  - Penicillin, clindamycin, amoxicillin, cephalosporins
  - Culture resistant organisms
  - Chlorhexidine gluconate 0.12%

Preventatives for Cavities

- **Prevention**
  - Chlorhexidine gluconate 0.12%
  - Fluoride varnish (off label)
  - Fluorides as rinse or applied via custom trays
    - Custom trays highly recommended for gel
    - Gel better than foam
    - Stannous fluoride gel 0.4%
    - Sodium fluoride gel 1.0%, 1.1%
    - OTC fluoride rinse
  - Silver Diamine Fluoride
    - FDA approved 2014 for hypersensitivity
    - Arrests caries in dentin

Cavities-Modify Diet

- **Diet**
  - How you eat is as important as what you eat
  - Frequency and amount of refined carbohydrates
  - Frequency and amount of acidic substances (even if sugar free)
    - Diet soda pop
    - Energy drinks
    - Sports drinks
**Hyposalivation: Substitutes**

- **Large Selection**
  - Mouthwashes, toothpastes, moisturizers, gums, sprays
- **Poor patient acceptance**
  - Feels like someone else's saliva

- **“Home” Remedy**
  - Frequent sips of water
  - Ice Chips
  - Avoid larger ice cubes since the larger surface may actually stick to the dry mucosa

**Saliva Subs: Constituents**

- **Proteins**
  - Lactoferrin
- **Coating Agents**
  - Carboxymethyl cellulose
  - Xanthum gum
  - copovidine
- **Preservatives**
  - Preferably none

- **Enzymes**
  - Lactoperoxidase
  - Glucose Oxidase
  - Lysozyme
- **Flavorings**
  - Mint
  - Citrus
  - None

**Hyposalivation: Stimulation**

- **Gustatory**
  - Sugarless hard candies
  - Avoid citric candies since they may irritate mucositis and promote acidic destruction of tooth structure
- **Mechanical**
  - Sugarless chewing gums (xylitol)
  - Hard foods such as carrot or celery sticks, good and healthy for snacking!
Hyposalivation: Pharmacologic Stimulation

- Pilocarpine HCl
  - 5mg tablets, one three to four times daily
  - Titrate up to two tablets per dose, not to exceed 30mg daily dose
  - Muscarinic cholinergic agonist
  - Targeted for Sjögren’s Syndrome

- Cevimeline HCl
  - 30mg taken three times per day
  - Insufficient evidence for higher or more frequent dosing
  - Muscarinic cholinergic agonist
  - Targeted for Sjögren’s Syndrome

Additional Aids....

- Avoid spicy foods
- Add liquids to diet
- Humidify the air
- Filter room air
- Lip moisturizers

References

Thank You!

Questions?