Long Term Toxicities of Head & Neck Cancer Therapies

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Head & Neck Cancer

• 2-3% of all cancers
• 1-2% of all cancer deaths
• Incidence includes:
  – 21,300 cases of oral cavity cancers
  – 10,600 cases of larynx cancer
  – 8,300 cases of pharynx cancer
Risk Factors

• Cigarettes
  – 6x greater than in nonsmokers
  – Mortality of larynx cancer α consumption

• Cigars
  – Increase where pooling of saliva and associated carcinogens occur (oropharynx, esophagus)

• Smokeless Tobacco
  – Oral Cavity
Risk Factors

• Alcohol
  – Risk by itself and synergistic with tobacco

• UV light exposure
  – Cancer of the lip

• Occupational exposure
  – Wood dust – Nasal Cancer
  – Nickel – Maxillary Sinus

• Diet – vitamin A, Fruits & Vegetables

• Mouthwash – alcohol content
Risk Factors

• Epstein-Barr Virus
  – Nasopharynx Cancer
    • Anti-EBV antibodies in sera and saliva
  – Southern China, Northern Africa
  – Increase risk with major histocompatibility profiles – H2, BW46, B17 locus antigens

• Human Papillomavirus
  – Mainly Oropharynx tumors - ? 30% ?
  – Increasing incidence

• Herpes Simplex Virus (?)
Treatment

• Early Stage
Treatment
Advanced Disease – Stage III/IV

- **Unresectable Disease**
  - Chemoradiation
  - Radiation Therapy
  - Very poor outcome

- **Resectable Disease**
  - Surgery + RT
  - Radiation
  - Chemoradiation
  - May involve removal of voice box
Toxicities

• Quality-of-life

• Complex Therapies

• Risk-benefit

• Tissue injury due to ↑ levels of toxicity
Swallowing dysfunction

Dysphagia:
Disruption in the swallowing process during bolus transport from the oral cavity to the stomach.
Swallowing dysfunction

• The severity of swallowing problem depends on:
  - Type of treatment
  - Size and location of the tumor
    - Larynx
    - Oral cavity
Risk factors

• Surgical:
  • Disruption of anatomic structures involved in swallowing
  • Size of resection of the oral tongue or tongue base
  • Nature and extent of reconstruction/grafts
  • Pharynx or cervical esophagus → FLAPS
Risk factors

• Denervation
  Trigeminal nerve (CNV) controls facial sensation and motor supply to muscles of mastication
Radiation

- The intensity of radiation, total dose of and the site receiving radiation.

- Radiation to the pharynx
  - alter tongue mobility
  - speech changes
  - impair pharyngeal wall motion → swallowing problems.
Risk factors

• Chemoradiation
  Neck dissection
    – Damage to pharyngeal plexus
    – Mucosal edema
    – Esophageal stenosis/fibrosis
Symptoms

• pain and dryness

• urge to swallow to clear food from the mouth and throat

• throat clearing while eating

• gurgly wet-sounding voice after swallowing

• (+)cough or choking
Assessment

– Modified Barium swallow → (gold standard) or traditional

– Fiberoptic endoscopic evaluation of swallowing (FEES)

– Videofluoroscopy

– Blue dye testing – tracheostomy patients
Rehabilitation

• Goals:
  – Aspiration
  – Dehydration
  – Malnutrition
Treatment

• Muscle exercises
  – Tongue holding maneuver, shaker exercises

• Compensatory strategies
  – head postures (e.g., chin tucks or turning the head to one side may help for a safe swallow)

• Diet

• Swallowing techniques – super supraglottic
  – Partial laryngectomy
Xerostomia
Xerostomia

- Subjective sensation of oral dryness
- Incidence: > 90%
- Permanent > 40-50Gy
- Chronic: Salivary fibrosis
Symptoms

- Dry mouth
- ± burning
- Dysphasia
- Stickiness of food
- Speech
Problems

• ↑↑ risk of osteonecrosis

• ↑ risk aerobic organisms → (strep & lactobacillus)

• Dental → ± root & crown cavities

• ± gum recession
Treatment

- Symptom relief

- Cytoprotection:
  - Amifostine

- Anticholinergics:
  - Pilocarpine, Cevimeline

- Acupuncture
Other Interventions

• Saliva substitutes

• Hard candy

• Fluids

• Humidifier

• Avoid use of tobacco & alcohol based mouth washes
Xerostomia
Cytoprotection

• Ethyol (Amifostine):

Disadvantages:
Dental Caries

- ↓ saliva
- Changes in quantity & composition
- PH changes
Risk Factors

• Radiation

• Xerostomia

• ↑ colonization with *Streptococcus mutans* and *Lactobacillus* organisms

• Poor oral hygiene
Treatment

• Prevention
  – Dental evaluation
  – Infections

• Topical fluorides

• Remineralization
  – high in calcium phosphate and fluoride
  – Daily fluoride rinse (.05%) or apply fluoride varnish.
Radiation-induced Dental Caries
Osteoradionecrosis

- Chronic bone and mucosa changes due to vascular inflammation and scarring resulting in hypovascular, hypocellular, and hypoxic changes.

- Incidence: 5-22%

- Overall risk: 15%
Onset

• 6-12 months

• Persists for years

• Biopsy - hypovascular or hypocellular osteonecrosis. Absence of active inflammation
Problems

- Chewing
- Swallowing
- Speech
Symptoms

• Swelling
• Pain
• ± trismus
• Fistula formation
• Mandibular fracture
Diagnosis

• Imaging
  – Ulceration
  – Necrosis
  – Exposure of necrotic bone
Soft Tissue Necrosis
Treatment

• Antibiotics
• Dental extractions
• HBO
• Reconstruction
• Follow-up
Shoulder dysfunction/pain

• Chronic pain and shoulder problems
  – QOL
  – Affects performance
  – Nerve-sparing and modified surgical techniques
Shoulder dysfunction/pain

• Trapezius muscle – major role in shoulder function

• Nerve supply:
  – Cervical plexus branches
  – Spinal accessory nerve (CN XI)

  – Denervation → shoulder syndrome
    • Painful, weakened and deformed shoulder
Treatment

• Goals

• Pain management

• Rehabilitation
Psychosocial distress

• Incidence: 40%

• Self image → disfigurement

• Coping abilities

• Social isolation

• Performance and functional abilities
Thyroid function

- Hypothyroid