

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 \propto 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

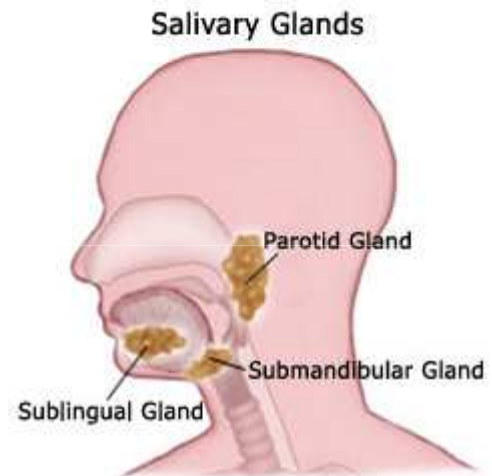
Rehabilitation

- 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
- \pm 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
vascular inflammation and scarring →
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
- \pm trismus
- Fistula formation
- Mandibular fracture

Diagnosis

- Imaging
 - Ulceration
 - Necrosis
 - Exposure of necrotic bone



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