Disclosures

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Goal of Presentation

- Describe role of cancer rehabilitation in the care of the person with HNC
- Describe common HNC related impairments and their treatment through rehabilitative interventions.
Cancer Rehabilitation

- Preserving function and quality of life for person with HNC:
  - Prevention of functional loss
  - Early identification and treatment of cancer related impairments
  - Regular surveillance for cancer related impairments

Cancer Rehabilitation Continuum of Care

- Pre-Habilitation
- Active treatment
- Survivorship

Cancer Rehabilitation

- Preventive ("Pre-habilitation")
  - Minimize risk for development of impairments (i.e. program to preserve shoulder, neck, jaw and swallowing function) during HNC treatment
- Restorative
  - Therapeutic approaches used to address the impairments once identified with the goal to restore motion, strength and function that has been limited.
Cancer Rehabilitation

• Supportive
  – improve functionality by working to compensate for the dysfunction

• Palliative
  – Minimize pain
  – Maximize level of function

Multidisciplinary Team

• Physiatry
• Physical Therapy
• Occupational Therapy
• Speech Pathology
• Social Workers
• Nutritionist
• Vocational Counselor

• Physiatry
• Head and Neck Cancer Surgeon
• Palliative Care Medicine
• Medical Oncologist
• Radiation Oncologist

HNC Related Impairments

• Risk of physical long term and late effects after therapy for HNC is determined by:
  – a) type of treatment(s),
  – b) duration and dose of treatment(s)
  – c) specific type of chemotherapy,
  – d) age of person during treatment,
  – e) location of primary tumor,
  – f) use of tobacco products.
HNC Related Impairments

- Dysphagia and Speech Impairment
- Trismus
- Radiation Fibrosis
- Neck movement restrictions
- Shoulder Dysfunction
- Chemotherapy induced Peripheral Neuropathy
- Generalized weakness

HNCT related impairments can be subtle in presentation

“New normal”-Patient may not provide information about loss of function.

Functional impact

- Work
- Family Life
- Hobbies
- Driving
Dysphagia

- 36-81% patients undergoing active treatment for oropharyngeal and hypopharyngeal squamous cell carcinoma develop dysphagia.
- Addition of chemotherapy to radiation therapy increases risk of developing dysphagia

Signs and symptoms of Dysphagia

- Coughing
- Difficulty swallowing & managing secretions
- Sensation of food stuck in throat or chest
- History of aspiration and/or pneumonia
- Loss of pleasure in eating,
- Weight loss and/or malnutrition
- Throat clearing during meals

Dysphagia Treatment

- Early intervention by a speech therapist is key!
- Modified diet
- Exercises to strengthen the tongue and other muscles involved in swallowing; compensatory swallowing techniques
- Note: Sudden-onset or rapidly progressing difficulty swallowing may be a symptom of tumor recurrence
Dysarthria
• Common side effect of HNC and its treatment
• Can be associated with:
  – Xerostomia
  – Glossectomy-leads to reduced articulation
  – Scarring of soft palate in the treatment of nasopharynx or oropharynx associated with impaired speech resonance

Trismus
• Inability to open the mouth
• Normal mouth opening in adults ranges between 23-71mm when measured between the incisors
• 5-38% of persons with HNC Tx develop trismus.
• Inability to open the mouth can effect:
  – Chewing, swallowing, oral hygiene, surveillance for cancer recurrence

Trismus-Treatment
• Physical Therapy
  – Stretching and Strengthening exercises
• Passive Range of Motion Devices
  – Dynasplint; Therabite
• Medications
  – Pregabalin, Gabapentin
• Injections
  – Botulinum Toxin
**Trismus Device**

- Dynasplint Device
- low-torque, prolonged duration stretch
- TheraBite Device
- High torque, short duration passive stretch

**Radiation Fibrosis**

- Radiation therapy used for HNC can affect:
  - Upper cervical nerve roots
  - Upper brachial plexus
    - Apical location in the neck
    - Long course traversed by its fibers in contrast to the middle and lower trunk, making them more susceptible to the effects of RT used in HNC
  - Dorsal Scapular nerve-rhomboids
  - Supraspinatus nerve-supraspinatus/infraspinatus
  - Spinal Accessory Nerve
Radiation Fibrosis Syndrome (RFS)

- Neuropathic pain—very common component of RFS
  - Radiculopathy, Plexopathy, Peripheral nerve injury
  - Due to compression of nerves, soft tissue fibrosis, ischemia to peripheral nerves
  - Pre-existing medical or degenerative disorders—more susceptible to pain

Radiation Fibrosis

- Effect on Muscle:
  - Direct damage to muscle—focal myopathy
  - Painful muscle spasms
  - Weakness and fatigue of the affected muscles
  - “Stiffness and/or tightness” sensation

Cervical Dystonia

- Painful spasm and contracture of the anterior neck due to radiation induced ectopic activity in spinal accessory nerve, cervical nerve roots and cervical plexus.

- Muscles commonly involved:
  - Sternocleidomastoid
  - Scalene muscles
  - Trapezius
Cervical Dystonia

- Painful muscles on palpation
- Fixed contractures of tendons, ligaments, muscles, skin
- Sustained painful contractions of the anterior neck muscles
- Restricted range of motion of neck
- Difficulty swallowing, speaking, driving, work related activities

Radiation Fibrosis Cervical Dystonia

Cervical Dystonia

- Neck extensor weakness:
  - Muscle imbalance
    - Weak: cervico-thoracic paraspinal and rotator cuff muscles
    - Strong: pectoral muscles
  - Effect:
    - Poor posture-shoulders and head flexed forward “C” shape
    - Bio-mechanical disadvantage for movement of the shoulder
    - Pain with shoulder movement
  - Other sources of pain- DJD of the spine; radicular pain with” referred pain” to the shoulders.
Cervical Dystonia

• Treatment:
  – ROM exercises-need to be initiated early and performed for life
  – Pain Medications:
    • Nerve Stabilizing medications-pre-gabalin, gabapentin
    • Opioids-second line treatment
  – Injection of botulinum toxin into the painful muscles (does not improve range of motion)

Cervical Dystonia

• Treatment:
  – Physical Therapy program:
    • Posture retraining
    • Core strengthening
    • Stretching of the pectoral muscles
    • Strengthening of the cervical, thoracic and rotator cuff muscles
  – Orthotic for neck extensor weakness
    • Headmaster Cervical Collar
Shoulder Dysfunction

- Shoulder dysfunction has been associated with a significant negative impact on QoL.
- Decreased shoulder flexion and abduction is associated with reduced QOL in long-term survivors of HNC.
- Higher risk of having shoulder dysfunction if the person underwent radical neck dissection.

Shoulder Dysfunction

• Contributing factors:
  – Neck dissection surgery (50-100% of patients)
    • Injury to the Spinal Accessory Nerve (SCM and trapezius)
  – RT effects on:
    • The upper cervical nerve roots
    • The upper trunk of the brachial plexus
    • The suprascapular n., dorsal scapular n. and spinal accessory nerves
    • The rotator cuff muscles
Shoulder Dysfunction

- Weakness of the:
  - Supraspinatus/infraspinatus
  - Biceps
  - Deltoid
- Adhesion of neck muscles to overlying platysma and skin
- Muscle imbalance between the above muscles and those not affected by the RT.
- Can lead to: adhesive capsulitis, rotator cuff impingement, and myofascial pain

Shoulder Dysfunction "Cascade"

Nerve Injury
- Supraspinatus
- Dorsal Scapular
- Spinal Accessory Nerve
- Upper brachial Plexus
- Upper cervical nerve roots
- Muscle Injury

HNC and Treatment
Shoulder Dysfunction

“Cascade”

HNC and Treatment

- NERVE INJURY
  - Supraspinatus
  - Dorsal Scapular
  - Spinal Accessory Nerve
  - Upper brachial Plexus
  - Upper cervical nerve roots
- MUSCLE INJURY
  - Shoulder Muscle Weakness and
    Reduced Range of Motion
  - Impaired GH motion

Shoulder Dysfunction

“Cascade”

HNC and Treatment

- NERVE INJURY
  - Supraspinatus
  - Dorsal Scapular
  - Spinal Accessory Nerve
  - Upper brachial Plexus
  - Upper cervical nerve roots
- MUSCLE INJURY
  - Shoulder Muscle Weakness and
    Reduced Range of Motion
  - Impaired GH motion

- Rotator Cuff impingement
- Adhesive Capsulitis
- Myofascial Pain

Shoulder Dysfunction

• Treatment:
  – Physical Therapy
    • Strengthening exercises: Rotator cuff muscles, core muscles, rhomboids, trapezius
    • Stretching exercises: pectoralis major
  – Medications
    • Pre-gabalin, gabapentin, duloxetine
  – Injections
    • Sub-acromial injection-steroid and anaesthetic
Lymphedema

• Incidence: >50% of persons undergoing HNC report lymphedema of the head, neck, face.

• Usually occurs 3 or more months after completion of treatment due to damage to the lymphatic system

• Can be subtle in presentation

Lymphedema

• Person may report swelling or fullness, tightness, or heaviness in the affected area.

• In severe cases, it can lead to difficulty swallowing, breathing and reduced movement of the neck.

Lymphedema-Tx

• Manual lymphatic drainage

• Compression garments.
Fatigue

- Fatigue is very common—especially for those undergoing RT and chemotherapy
- CRF can last long after the completion of treatment
- Treatable causes
  - anemia, thyroid dysfunction,
  - Sleep apnea, cardiac dysfunction.
  - mood disorders,
  - poor sleep hygiene
  - Pain

Exercise and Cancer Related Fatigue

- Exercise has a very strong evidence for treating cancer related fatigue!

Exercise and Cancer Related Fatigue

- It is recommended that persons undergoing cancer treatment as well as survivors perform:
  - **150 minutes per week** of moderate aerobic exercise
  - **2-3 sessions per week** of strength training arms, core abdominal muscles and legs.
Chemotherapy Induced Peripheral Neuropathy

- Taxanes (paclitaxel, docetaxel)
  - Paclitaxel-57-83% incidence
  - Docetaxel- 11-64% incidence
- Vinca alkaloids
- Platinum analogues (cisplatin, carboplatin)
  - Cisplatin- 28-100% incidence

Chemotherapy Induced Peripheral Neuropathy

- Sensory symptoms-most common; dysesthesias, allodynia
- Weakness
- Impaired balance and increased risk for falls
- Autonomic dysfunction
- Dose-limiting factor for certain chemotherapeutics or delay treatment, thereby influencing survival.

Chemotherapy Induced Peripheral Neuropathy

- Patients with underlying nerve injuries have increased risk of injury from chemotherapy ( DM, ETOH)
- Obesity, psychological distress, falls are associated with severe CIPN symptoms
CIPN Grading

• Grade 1- Mild symptoms
• Grade 2- Moderate symptoms-affect IADLs
  – Shopping, cleaning, meal prep
• Grade 3- Severe symptoms-affect ADL’s
  – Bathing, dressing, feeding, toileting

Common Terminology Criteria for Adverse Events (CTCAE) scale

CIPN Treatment

• PT-balance, strengthening,
• OT-ADL’s, adaptive equipment
• Education of patient-fall prevention
• TENS
• Medications-systemic ( duloxetine, TCA’s, gabapentin, opioids etc.),
  – Topicals: compounded formula-baclofen, amitriptyline and ketamine; capsaicin
• Acupuncture
• Bracing with orthotics

References

– Sarah M. Eickmeyer MD, Christine K. Walczak MPT, Katherine B. Myers BSN, RN, D. Richard Lindstrom MD, Allan Storek MD, MSc, Bruce A. Campbell MD, FACPM&R, 2014-12-01, Volume 6, Issue 12, Pages 1073-1080, Copyright © 2014 American Academy of Physical Medicine and Rehabilitation
Questions?