Can Rehabilitation Intervention Minimize Comorbidity In Clients With Head and Neck Cancer?

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Persons with head and neck cancer often face a long and complicated course of cancer therapies and medical management. Additionally, physical therapy for head and neck cancer may address several comorbidities.

1. Ipsilateral (on the same side) facial nerve dysfunction with sensory/motor loss to innervated areas.
2. Range of motion limitations of the ipsilateral temporomandibular joint (TMJ), shoulder, and the cervical spine.
3. Spinal accessory nerve dysfunction with associated scapulohumeral dyskinesia (defect in voluntary movement) and altered motor recruitment patterns secondary to ipsilateral trapezius weakness or absence.
4. Radiation fibrosis of the irradiated areas leading to soft tissue, muscle and boney compromise.
5. Xerostomia (dry mouth) dysphagia (difficulty swallowing), and dysarthria (difficulty speaking).
6. Surgical dissection of musculature, blood vessels and lymphatic tissues. The result is neuromuscular imbalances and weakness, venous distention and swelling/lymphedema.
7. Cancer related fatigue and nutritional deficits.

The degree of compromise is often dependent on the size and location of the lesion and the cancer therapies necessary to mitigate the tumor and prevent cancer recurrence.

Physical therapy may be indicated early during the course of care. Clients with head and neck cancer may lack the ability to follow through with the plan of treatment and home program due to lack of a support system, declining energy, pain, anxiety or fear.

R.R. was a 64 year old right dominant man who presents to outpatient physical therapy on December 4, 2007 with lymphedema secondary to squamous cell carcinoma involving the floor of the mouth. Past medical history included high blood pressure, diffuse osteoarthritis including the cervical spine, and coronary artery disease. R.R. was diagnosed with cancer in March 2007.

Surgical history included local resection floor of mouth on the right with cervical lymph node dissection in April 2007. Due to a positive lymph node biopsy a modified radical neck dissection was performed in May 2007. Right sided facial and neck edema persisted following this surgery. In November 2007 a subsequent modified radical neck dissection was performed due to cancer recurrence with
resultant increased neck/facial edema and spinal accessory nerve (Cranial Nerve XI and facial nerve (Cranial Nerve VII) dysfunctions.

Patient was single and lived with his older brother who was in fair health. The patient received no care from his brother and functioned independently. Originally this gentleman was a farmer, but more recently worked as a janitor in a local school. He was unable to work since the time of his initial surgery. No history of smoking, chewing tobacco or using alcohol was reported.

The rehabilitation plan was for outpatient physical therapy before undergoing chemotherapy and external beam radiation.

**Initial Findings 12/4/07:**

- **Pain** 3/10 at rest, 5/10 end range stretch cervical spine and right shoulder
- **Range of Motion** (Fairly firm end feel with some elasticity)
  - Cervical: 50% loss extension/retraction/left sidebend
  - 25% loss all else cervical spine
  - Shoulder: 60% with capsular pattern of restriction
  - TMJ: Opening 30mm
  - Protrusion 6mm
  - Lateral deviation left 10mm, right 0mm
- **Strength**
  - Cervical spine 4-/5 except right sidebend/bilateral rotation 3+/5
  - Right scapula/ shoulder 3+ to 4-/5 except 0/5 right trapezius
  - Facial nerve innervated musculature 0/5 on the right
- **FACT-H&N** 68/144 *(please define FACT H & N and is a higher or lower score better?)*

**Rehabilitation Intervention 12/07:**

Patient was seen in outpatient physical therapy for 8 visits from 12/4 until 12/19/07.
**Stretching exercises** to increase range of motion of the neck/TMJ/right shoulder

**Manual lymphatic drainage** to edematous areas of the head and neck for volume reduction

**Patient education** to teach compensatory strategies (secondary to Cranial Nerves (CN) VII and XI involvement)

**Home exercise program** (3 repetitions, 30 second end range hold twice daily for all motions of the cervical spine except flexion and protrusion; TMJ and shoulder flexion in the plane of the scapula, shoulder external/internal rotation)

  Low repetitions and prolonged end range hold are preferable for persons with limitations in range of motion due to non painful tissue restrictions.³

**Compression** included tubigrip and comprilan (low-stretch bandage) with komprex foam, ½” gray foam, and Schneider pack foam pieces for the submandibular area.

Compression schedule- 2 hours on and 2 hours off with progression as tolerated. If comfort and airway patency allow, compression is worn throughout the night.

**Short Term Outcomes 12/19/07:**

Range of motion gains at grossly 25%

FACT-H&N 116/144

Small volume reductions were due to difficulty adhering to the compression schedule. Home exercises and compression programs resulted in minimal adherence, perhaps due to lack of family support and anxiety concerning upcoming chemotherapy and radiation.

Patient education- Patient demonstrated understanding of home exercises, posture correction, body mechanics and functional modifications.

Patient was then discharged from physical therapy and received external beam radiation for 30 sessions from 12/21/07 through 2/6/08 and chemotherapy (Docetaxel) 7 sessions from 12/24/07 through 2/08. He returned to physical therapy in 3/08. Patient’s oncologist did not permit him to attend physical therapy sessions during his cancer treatments and for 1 month following chemotherapy and radiation. R.R. was independent in his home exercise program. Compression was contraindicated in the radiation field while receiving external beam radiation.

**Reevaluation 3/08:**
Pain 8/10 pain in the oral cavity at rest and during activity due to open sores

Range of Motion  (Firm end feel secondary to radiation fibrosis)

Cervical range of motion had decreased:

100% loss of cervical extension/retraction/left sidebend

75% loss of all other neck motions with the exception of flexion and protrusion with no loss

Shoulder- 60% with capsular pattern of restriction

TMJ range of motion had decreased:

Opening- 20mm

Protrusion- 2 mm

Lateral deviation- 5mm to left and 0 mm to right

Strength was unchanged:

Cervical spine was 4-/5 except right sidebend and bilateral rotation 3+/5

Right scapula and shoulder- 3+ to 4-/5 except 0/5 trapezius

Facial nerve innervated musculature is 0/5 on the right

Function

Patient is unable to lie in bed, rather sleeping in his recliner chair due to lack of neck mobility. He states to the physical therapist, “I am in bad shape. I really need to come back for therapy. I need help.”

FACT-H&N 98/144
As illustrated above, in March 2008 a forward head and flexed neck posture are evident. Marked erythema, fibrosis and dermal adherence are noted in the radiation field. Volume reduction is noted in the affected area. (Note that the patient lost 25 pounds in 3 months.) With passive stretching to end range in the TMJ and neck the end feel is firm. There is no change in strength or apparent renervation of CN IV and XI. The patient reported not performing the home exercise program due to fatigue, side effects of his cancer therapies, and lack of knowledge on how to modify exercises due to new symptoms. Patient had been instructed in specifics before being discharged from physical therapy but appeared to lack the confidence and motivation to exercise.

Questions may be asked concerning early physical therapy intervention for persons with head and neck cancer.

1. Should the physical therapist be permitted to intervene during radiation in order to minimize the negative effects on function, strength, range of motion, and posture?
2. Is it realistic to require the patient and/or significant others to continue exercises independently during the course of radiation therapy?
3. Is it reasonable to require the patient to attend regular physical therapy sessions during chemotherapy and radiation, or is it best to schedule more intermittent check ups through the weeks of undergoing cancer therapies?

Good communication between the medical care team and the patient allow for maintenance of mobility, strength and function, minimizing morbidity. Close
monitoring of medical status allows for safe and effective physical therapy intervention.

Physical therapy intervention for head and neck cancer is an advanced specialty within the field of lymphedema management. Introductory certification programs approved by LANA cannot instruct the entry level lymphedema therapist in intervention for these individuals. Persons with head and neck cancer are medically complex and benefit from intervention by a lymphedema therapist possessing extensive medical background with sound clinical decision making and manual skills. Many of the LANA approved lymphedema schools provide advanced training in head and neck cancer intervention for certified lymphedema therapists.

Definitions:

Ipsilateral – on the same side

Dyskinesia – defect in voluntary movement

Xerostomia – dry mouth caused by decrease in normal salivary secretions.

Dysphagia – difficulty swallowing.

Dysarthria – difficulty speaking.

FACT-H&N – a tool to assess function of the head and neck.