Musculoskeletal issues in breast cancer

Sasha E. Knowlton, MD
Assistant Director of Cancer Rehabilitation
Disclosures

- I have no financial relationships with a commercial entity producing healthcare-related products and/or services to disclose.
Outline of talk

• General information
• Anatomy review
• Impairments
  – Shoulder
  – Neck
  – Nerves
  – Pain
  – Others
The Past

- Egyptians through Hippocrates

- 1900s: Halsted radical mastectomy

- Further surgeries

- 1930s-1940s: Chemotherapy + Radiation

- 1970s: Mammograms and hormone therapy

Who are we talking about?


Examples of Cancer-related Impairments

- Fatigue
- Arthralgia
- Myalgia
- Neuropathic pain
- Weakness
- Deconditioning
- Autonomic dysfunction
- Back pain
- Balance dysfunction
- Bowel dysfunction
- Chemotherapy-induced peripheral neuropathy
- Dystonia
- Graft-versus-host-disease
- Headaches
- Falls
- Lumbosacral plexopathy
- Neck pain
- Osteopenia/osteoporosis
- Paralysis
- Radiation Fibrosis Syndrome
- Radiculopathy
- Scapular winging
- Scar adhesions
- Sensory deficits
- Sexual dysfunction
- Shoulder pain
- Dysphagia
- Trismus
- Urinary dysfunction
- Muscular asymmetry
- Visuospatial dysfunction

How common are impairments in breast cancer?

- In one study, 6 years after diagnosis, >60% of women experienced at least one impairment.

- In another study of metastatic breast cancer patients, 92% identified at least one impairment.


“Cancer rehabilitation involves helping a person with cancer to help himself or herself to attain maximum physical, social, psychological and vocational functioning within the limits imposed by the disease and its treatment” *Cromes 1978*

“Cancer rehabilitation is a program that helps people with cancer to maintain and restore physical and emotional well-being. Cancer rehabilitation is available before, during and after cancer treatment.” *Mayo Clinic 2012*


Overview of breast cancer interventions

- Partial mastectomy (i.e. lumpectomy)
- Mastectomy
  - Simple
  - Skin-sparing (or nipple sparing)
  - Modified radical
  - Radical
- Lymph node dissection
  - Axillary versus Sentinel
- Radiation/Chemotherapy

Anatomy Review - Shoulder

Posterior shoulder

Anterior Shoulder


https://www.pinterest.com/pin/494833077782501164/
Anatomy Review - Neck

http://www.suggestkeyword.com/c2hvdWxkZXIgbXVzY2xlcw/
Why should we be concerned about musculoskeletal issues in breast cancer?

- High prevalence of arm/shoulder problems in breast cancer survivors
- Nesvold (2011) investigated breast cancer survivors (stage II –III) between 4-7 years after diagnosis
- All had modified radical mastectomy or lumpectomy with axillary lymph node dissection with radiation (50 Gy in 25 fractions)

- Women who had arm/shoulder problems reported lower quality of life scores which did not change significantly 3 years later


The Need for Cancer Rehab Services

- Cheville et al: 163 patients with stage IV breast cancer

Figure 1 from: Cheville, Andrea L., Alice B. Kornblith, and Jeffrey R. Basford. "An examination of the causes for the underutilization of rehabilitation services among people with advanced cancer." American Journal of Physical Medicine & Rehabilitation 90.5 (2011): S27-S37.
Part I: Shoulder

How do breast cancer survivors compare to those who have not had breast cancer?

- Diagnosed with stage 0-III breast cancer and completed all treatment within 6 months

- Compared to similar women:
  - Decreased shoulder strength
  - Decreased active and passive range of motion
  - Increased shoulder disability

Rotator Cuff

- **Symptoms include**
  - Pain
  - Limited movement*
  - Weakness*
  - Reduced function

- **Treatment**
  - Physical therapy
  - Medications
  - Injections


Adhesive Capsulitis

• AKA “Frozen Shoulder”

• Symptoms
  – Pain
  – Reduced movement

• Treatment
  – Physical therapy
  – Medications

Axillary Web Syndrome

- Aka “Cording”

- Painful palpable cords of fibrous tissue that develop post-operatively and limit movement

- Incidence 12 months post-operatively: 28-48%

http://www.breastcancer.org/treatment/side_effects/aws


http://klosetraining.com/course/in-classroom/breast-cancer-rehabilitation/
Aromatase Inhibitor-Induced Arthralgia

- Aromatase Inhibitors (AI)
  - Anastrozole
  - Letrozole
  - Exemestane
- Arthralgia includes:
  - Symmetric joint pains
  - Carpal tunnel syndrome
  - Trigger finger
- Boonstra et al:
  - Incidence 74%
Management of AI-induced arthralgia

- **Non-pharmacologic**
  - HOPE trial

- **Pain management**
  - Psychological treatments
  - NSAIDs or Tylenol
  - Narcotics

- **Briot et al: The ATOLL study**
  - Switching to a different aromatase inhibitor agent

- **Overall needs more investigation**

---

Part II: Neck
Cervical Radiculopathy

- Symptoms include
  - Neck and arm pain
  - Numbness
  - Weakness

- Additional testing if worsening symptoms

- Treatment
  - Medications
  - Physical/Occupational Therapy
  - Injections
  - Surgery

http://www.advancedspineboston.com/conditions/cervical-radiculopathy/

Myofascial pain syndrome

• Syndrome of active myofascial trigger points

• Incidence 12 months after surgery: 44.8%
  - Commonly in lattisimus dorsi, serratus anterior, pectoralis major

• Not influenced by surgery, radiation, number of lymph nodes removed


http://www.fysioteam-hilversum.nl/behandelingen/triggerpoint-therapie/
Part III: Nerves
Brachial Plexopathy

- Possible cancer-related causes
  - Radiation
  - Recurrence/Metastases

- Symptoms
  - Pain
  - Sensation changes
  - Weakness

- Treatment based on cause

http://www.assh.org/handcare/hand-arm-injuries/Brachial-Plexus-Injury#prettyPhoto[Gallery 3977_38203]/0/

Chemotherapy Induced Peripheral Neuropathy

• Results from damage or dysfunction of peripheral nerves
  - Sensory
  - Motor
  - Autonomic

• Review by Seretny et al:
  - 68.1% prevalence of CIPN within 1st month
  - 60% at 3 months
  - 30% at 6 months or more


Figure 1 from: Han, Yaqin, and Maree T. Smith. "Pathobiology of cancer chemotherapy-induced peripheral neuropathy (CIPN)." *Frontiers in pharmacology* 4 (2013).
Why care about CIPN?

• **Quality of life**
  
  – Tofthagen et al: Worse quality of life associated with increased CIPN
  
  – Mols et al: CIPN and quality of life systematic review
    
    • Majority of studies show more CIPN symptoms correlated with lower quality of life


Why care about CIPN?

• Worse performance on functional tests
• Conservative gait with slowed walking speed = increased fall risk
• Lower levels of function/ADLs
• Increased odds of falling x 1.8

CIPN: Prevention and Treatment

- Hershman et al: Practice Guideline
  - No agents for prevention
  - Duloxetine can be used for treatment

- PT - desensitization, proprioceptive feedback, TENS

- AFOs

- Others – acupuncture


Mononeuropathy

- **Types**
  - Carpal tunnel syndrome
  - Ulnar mononeuropathy

- **Testing**
  - Electrodiagnostics

- **Treatment**
  - Splints
  - Physical and occupational therapy
  - Medications
  - Injections
  - Surgical release


http://www.wecareforlife.com/hand-center/endoscopiccarpaltunnelrelease
Part IV: Post-mastectomy Pain Syndrome

Intercostobrachial nerve

- The lateral cutaneous branch of the second intercostal nerve does it is named the **intercostobrachial nerve**.
- It pierces the external intercostal and Serratus anterior, crosses the axilla to the medial side of the arm, and joins with a filament from the **medial brachial cutaneous nerve**.
- It supplies the skin of the upper half of the medial and posterior part of the arm.
- The intercostobrachial nerve is also sometimes divided in axillary node clearance.

Proposed 2016 definition

- Post-mastectomy pain syndrome:
  - Occurs after any breast surgery
  - At least moderate severity
  - Possesses neuropathic qualities
  - Located in the ipsilateral breast/chest wall, axilla, and/or arm
  - Lasts at least 6 months
  - Occurs at least 50% of the time
  - May be exacerbated by movements of the shoulder girdle.

Management of PMPS

- Medications
  - Gabapentin
  - Venlafaxine/Duloxetine
  - TCAs: amitriptyline, imipramine, doxepin, nortriptyline
  - Topicals (lidocaine, capsaicin)
- Nerve Blocks
- Rehabilitation
- Resection of neuroma
  - Tinel’s sign followed by lidocaine block
- Alternative medicine
- Counseling


UpToDate: Postmastectomy pain syndrome: Risk reduction and management

Part V: Other Lymphedema

- Accumulation of fluid
- Limits motion; pain, heaviness, numbness

- Treatments include
  - Physical therapy
  - Medications
  - Surgery/lasers


Are there any guidelines?

- Clinical practice guideline published 2012
  - Preoperative arm function assessment
  - Postoperative physical therapy
  - Active stretching
  - Frequent reassessments
  - Progressive resistance exercises

- Other guidelines for cancer-related pain, fatigue, peripheral neuropathy

QUESTIONS?
References


