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Physical Therapy Management for a 68-year-old Female Following Right Breast Lumpectomy: A Case Report

Mackenzie Dumm

PHYSICAL THERAPY MANAGEMENT FOR A 68-YEAR-OLD FEMALE FOLLOWING RIGHT BREAST LUMPECTOMY: A CASE REPORT

by

Mackenzie Dumm
Bachelor of Science in Kinesiology
University of North Dakota, 2018

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This Scholarly Project, submitted by Mackenzie Dumm in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

Mohamed Elhamadany

(Graduate School Advisor)

DocuSigned by:
David Relling
AE147CE500EA419...

(Chairperson, Physical Therapy)

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ABSTRACT

Background and Purpose. This case report describes and evaluates the clinical decision-making process, physical therapy interventions, and clinical outcomes of a patient with upper extremity pain and functional limitations that presented following breast cancer treatment including a right breast lumpectomy, chemotherapy, and radiation therapy.

Case Description. The patient was a 68-year-old female who was diagnosed with breast cancer in the right breast and received post-surgical physical therapy simultaneously with radiation therapy.

Intervention. Physical therapy interventions were developed with an emphasis on low intensity and short duration cardiovascular activity, thoracic mobility, upper extremity strengthening, scapular stabilization, scar tissue mobilization, and lymphedema prevention and management. Physical fatigue and pain and tenderness in the right upper extremity following radiation therapy were taken into consideration when choosing exercise progressions.

Outcomes. Outcomes were measured using the Quick DASH outcome measure. Following 6 physical therapy treatment sessions, the patient demonstrated improvements in gross motor skills, functional activities of daily living, and general pain in the right upper extremity.

Discussion. Although the patient demonstrated positive results in gross motor skills and functional activities following physical therapy treatment, further research is recommended to analyze the long-term results of physical therapy intervention and the best plan of care following a unilateral breast lumpectomy, chemotherapy, and radiation therapy.

CHAPTER I

BACKGROUND AND PURPOSE

Breast cancer is the most common type of cancer found in women worldwide and there were more than 250,000 new cases that were diagnosed in just the United States in 2017.[1,2] Approximately 12% of all women in the United States will develop breast cancer at some point in their lifetime.[2] Currently, more than 50% of breast cancers are diagnosed during a screening mammogram, while relatively 33% are diagnosed through the palpation of a breast mass. In the United States, approximately 66% of breast cancers are found directly in the breast tissue during the initial diagnosis and relatively 31% of breast cancers extend into the lymphatic system and nearby lymph nodes.[2] Breast cancer is staged I-IV. Stage I represents a tumor in the breast that is smaller than 2 cm and does not involve the lymph nodes, while Stage IV involves distant metastatic disease.[2]

Typical treatment for patients with breast cancer includes systemic therapy, chemotherapy, surgical management, and radiation therapy.[2] There are two main types of surgical treatment for breast cancer, which include breast-conserving surgery and a mastectomy. Breast-conserving surgery includes a lumpectomy, quadrantectomy, partial mastectomy, or segmental mastectomy.[3] Unlike a mastectomy that removes the entire breast, a lumpectomy is a less invasive surgery that removes a lump and only a small amount of normal tissue, as shown in Figure 1.[4,5] The primary advantage of a lumpectomy is that it preserves as much of the appearance and sensation of the breast tissue as possible.[4] Lymph nodes may also be removed with the surrounding tissue to

determine if cancer has spread beyond the breast tissue.[5] It is typical to have 5-7 weeks of radiation therapy following a lumpectomy.[4]

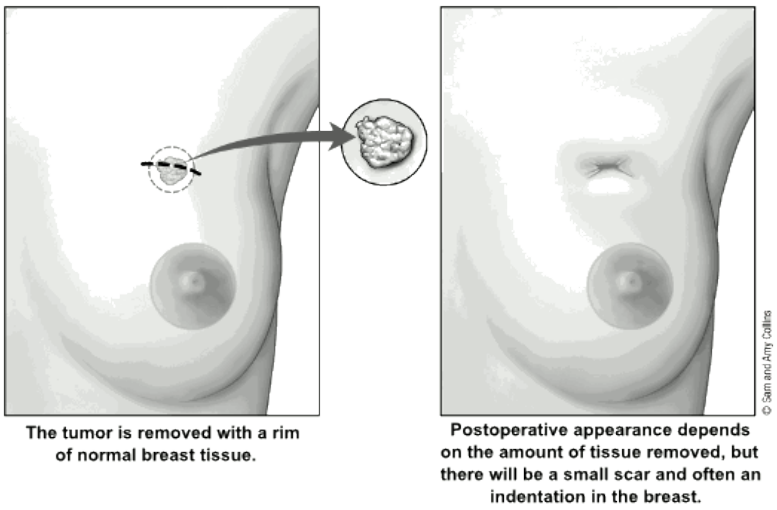

Figure 1. Lumpectomy

Reprinted from https://www.cancer.org/cancer/breast-cancer/treatment/surgery-for-breast-cancer/breast-conserving-surgery-lumpectomy.html

With the development of new treatment methods, survival rates for breast cancer have continued to rise. However, treatment can result in complications and adverse effects. These effects can lead to a decrease in overall function, specifically in the upper extremity.[1,6] Following axillary dissection for breast cancer, about 20% of patients will develop arm lymphedema, which is a leading concern in the literature.[6,7] Along with lymphedema, primary impairments include decreased range of motion, decreased muscle strength, and increased pain, as well as fatigue.[7] This can lead to limitations in overall function, activities of daily living, and participation in work and community activities.[1]

To the best of the authors' knowledge, current literature focuses on physical therapy treatment status post mastectomy and breast cancer survivors. There is minimal research on specific treatment interventions used for patients with breast cancer who have received a lumpectomy, followed by chemotherapy and radiation therapy. The purpose of this case report was to describe the clinical decision-making process and physical therapy interventions for upper extremity pain and functional limitations that presented following a right breast lumpectomy, chemotherapy, and radiation therapy. The topics that will be covered within this case report will include clinical impairments, clinical reasoning in the development of a physical therapy plan of care, factors that influenced the changes in the interventions prescribed, and the outcomes of the case.

CHAPTER II

CASE DESCRIPTION

The patient was a 68-year-old female who is retired and lives at home with her husband. The patient was diagnosed with right breast cancer and received a right breast lumpectomy in the same month. She received both chemotherapy and radiation therapy following the lumpectomy. Chemotherapy was started in the same month as the diagnosis and the patient was treated for 5 months. Radiation therapy followed the completion of chemotherapy and began after the initial physical therapy evaluation. It was completed during the course of physical therapy treatment. During the initial examination, the patient reported experiencing unexplained weight changes, numbness and tingling, dizziness, and muscular weakness. She presented with elevated levels of fatigue that prevented her from completing her typical activities of daily living. She reported that general movement was painful and difficult, and she experienced pain in her shoulder for the majority of the day. The patient's concerns were specifically about potential increasing lymphedema in the trunk, legs, and the right shoulder, thorax, and axilla, decreasing bone density, and low activity levels. Her primary limitations included pain and difficulty with increased movement, general pain and tenderness in the right shoulder and thorax, and restrictions with household activities (loading and unloading the dishwasher, dressing, food preparation, carrying groceries, laundry, and pet care). The patient also reported sleeping for longer durations than normal.

Examination, Evaluation and Diagnosis

It was essential that other pathologies that may cause shoulder pain and restriction were ruled out to determine the correct plan of care for the patient.[8] The functional outcome measure chosen for this patient was the Disabilities of the Arm, Shoulder, and Hand Score, also known as the Quick DASH, which is found to have 79% sensitivity and 75% specificity.[9] The patient had a score of 27.27/100, where a higher score denotes a higher disability level.[9] The Quick DASH demonstrated that the patient experienced “moderate difficulty” with gross motor activities, including recreational activities that involve force through the upper extremity, social activities with friends, family, neighbors, or other groups, and with work and other regular daily activities. She also experienced “moderate difficulty” with opening a tight or new jar, indicating deficits in grip strength, as well as “moderate” arm, shoulder and hand pain and tingling. The initial Quick DASH is presented in Figure 2 at the end of this chapter.

During the initial evaluation, the patient was observed to have rounded shoulders and erythema over the right breast. She presented with a 2-inch scar over the lateral side of the right breast and lymphedema was observed over the right axillary fold. Shoulder active and passive range of motion were tested in a seated position. All motions were found to be within functional limits, but she did demonstrate decreased pectoralis major and pectoralis minor flexibility on the right compared to the left. This may lead to decreased shoulder internal rotation, flexion, extension, horizontal abduction, adduction, as well as movement of the scapula, including depression, abduction, and downward rotation.[10] Specific motions that were decreased included shoulder flexion and abduction. Although a complete thoracic and lumbar evaluation

was not completed, the patient demonstrated restriction and deficits of the right middle and upper thoracic spine in extension and side bending. Thoracic extension was approximately 10º, where the normal range of motion is approximately 15-20º.[8] Side bending was measured by fingertip location, which reached to the mid-thigh bilaterally.

Shoulder strength was tested using resisted isometrics for motions including shoulder shrug, abduction, internal rotation, external rotation, flexion, and extension. All shoulder motions were considered strong, but the patient stated she experienced general pain in the right upper extremity with movements, which was also indicated on the initial Quick DASH. Upper extremity reflexes were examined and determined 2+ normal bilaterally, as shown in Table 1 below. Special tests were used to determine the integrity of specific structures. The tests that were used included Hawkins-Kennedy Impingement Test (Sensitivity 79%, Specificity 59% for subacromial impingement)[11], Neer Impingement Test (Sensitivity 72%, Specificity 60% for subacromial impingement)[11], Empty Can Test (Sensitivity 86%, Specificity 50% for rupture of the supraspinatus tendon)[8], Subscapularis Lift Off Test (Sensitivity 97%, Specificity 96% for subscapularis tear)[8], Drop Arm Test (Sensitivity 24%, Specificity 96% for rotator cuff rupture)[12], and Speed's Test (Sensitivity 54%, Specificity 81% for biceps pathology)[8]. All special tests were determined negative bilaterally, as shown in Table 2.

Table 1. Upper Extremity Reflexes

	Right	**Left**
Biceps C5,6	2+ Normal	2+ Normal
Triceps C7	2+ Normal	2+ Normal
Brachial Radialis C5,6	2+ Normal	2+ Normal

Table 2. Special Tests

	Right	Left
Hawkins-Kennedy Impingement Test	Negative	Negative
Neer Impingement Test	Negative	Negative
Empty Can Test	Negative	Negative
Speed Test	Negative	Negative
Subscapularis Lift-Off Test	Negative	Negative
Drop Arm Test	Negative	Negative

Passive joint mobility of the shoulder was tested, including the posterior, anterior, and inferior capsule, which all presented as normal bilaterally, displayed in Table 3 below. Stability of the glenohumeral joint, including load and shift, apprehension, and relocation were tested, and all found to be negative, presented in Table 4. Palpation was important to include in the initial examination as it allowed us to localize swelling, identify points of tenderness, identify soft tissue changes, locate changes in muscle tone, and detect any skin changes following the breast lumpectomy.[8] The patient was tender to palpation of the right chest wall, axillary fold, around the incision scar, and soft tissue of the pectoralis major and pectoralis minor, triceps brachii, biceps brachii, and forearm extensors of the right arm.

Table 3. Passive Joint Mobility of Shoulder

	Right	Left
Posterior Capsule	Normal	Normal
Anterior Capsule	Normal	Normal
Inferior Capsule	Normal	Normal

Table 4. Glenohumeral Joint Stability

	Right	Left
Load and Shift	Normal	Normal
Apprehension	Normal	Normal
Relocation	Normal	Normal

Results from the initial evaluation were analyzed and a diagnosis was developed. There was no indication of a rotator cuff pathology, labral tear, bursitis, impingement in the shoulder, or other specific pathologies. It was likely this patient had right upper extremity pain and limitation due to tissue changes in the right breast and upper right extremity as a result of the patient's surgical intervention of a lumpectomy, along with chemotherapy.

Prognosis and Plan of Care

Following the initial evaluation, the prognosis and rehabilitation potential for the patient was determined to be good. Although the patient presented with increased levels of fatigue and limitations with activities of daily living (ADLs), the patient was

highly motivated to return to her prior level of function and to participate in social and recreational activities. There were no determined contraindications to therapy.

The patient was educated on her diagnosis, prognosis, and plan of care. A comprehensive initial home exercise program was developed, with emphasis on very low intensity and short duration cardiovascular activity, thoracic mobility, upper extremity strengthening, scapular stabilization, scar tissue mobilization, and lymphedema prevention and management. The patient was to be seen 1 time per week for a total of 8 weeks. The primary goals for the patient were determined from patient reported functional limitations and deficits found in the initial examination. These goals included (1) to bend and reach forward in order to complete household activities, such as taking shoes on and off, dressing, and unloading and reloading the dishwasher, (2) to decrease tenderness in the anterior chest wall, right breast tissue, and axillary fold, (3) to reduce her Quick DASH score, (4) to return to physical activity, including tennis, without increased pain, (5) to improve her exercise capacity, (6) to demonstrate equal pectoralis major/minor flexibility of left and right upper extremity abduction and flexion.

It was necessary to keep in mind that the patient would be starting radiation therapy, as reported during the initial evaluation. Radiation therapy would take place simultaneously through the course of physical therapy treatment; therefore, patient response to exercises would be taken into consideration throughout the plan of care. Two important considerations in regard to this included continued low energy levels and fatigue, as well as increased pain and tenderness in the right upper extremity, as these are common side effects of radiation therapy.[13] These factors determined interventions

that were chosen in order to maintain effectiveness and meet the patient's goals but would not over-exert her or cause increased pain.

1. Please rate your pain level with activity: NO PAIN = 0 1 2 3 4 (5) 6 7 8 9 10 = VERY SEVERE PAIN

Please rate your ability to do the following activities in the last week by circling the number below the appropriate response.

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar	1	2	(3)	4	5
2. Do heavy household chores (e.g., wash walls, floors).	(1)	2	3	4	5
3. Carry a shopping bag or briefcase.	(1)	2	3	4	5
4. Wash your back	(1)	2	3	4	5
5. Use a knife to cut food.	(1)	2	3	4	5
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand(e.g., golf, hammering, tennis, etc.).	1	2	(3)	4	5
	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
7. During the past week, to what extent has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbors or groups?	1	2	(3)	4	5
	NOT LIMITED AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	1	2	(3)	4	5
Please rate the severity of the following symptoms in the last week. (circle number)	NONE	MILD	MODERATE	SEVERE	EXTREME
9. Arm, shoulder or hand pain.	1	2	(3)	4	5
10. Tingling (pins and needles) in your arm, shoulder or hand. ~fingers	1	2	(3)	4	5
	NONE	MILD	MODERATE	SEVERE DIFFICULTY	SO MUCH DIFFFICULTY THAT I CAN'T SLEEP
11. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand? (circle number)	(1)	2	3	4	5

$\frac{23}{11} - 1 \times 25 = 27.27$

Figure 2. Initial Disabilities of the Arm, Shoulder, and Hand Score (Quick DASH).

CHAPTER III

INTERVENTION

The patient was to be seen for 1-hour appointments, 1 day per week for a total of 8 weeks. Following the initial evaluation, a home exercise program was developed for the patient. As stated above, the exercises were chosen with an emphasis on very low intensity and short duration cardiovascular activity, thoracic mobility, upper extremity strengthening, scapular stabilization, scar tissue mobilization, and lymphedema prevention and management. Although the patient presented with minimal lymphedema in the axillary fold, the management of lymphedema was included in the plan of care for education and prevention purposes, as research shows this is a common adverse effect status post breast lumpectomy.[6] The patient was instructed to participate in activities such as outdoor walking, stationary bike riding, and the elliptical machine for about 15-30 minutes, 3 times per week, or as tolerated, to promote cardiovascular activity and muscular endurance and strengthening, as well as improve levels of fatigue. She was educated on exercises that promote thoracic extension and rotation to emphasize functional motions that were restricted, including side lying thoracic rotation, child's pose on the wall, and supine and standing straight arm shoulder abduction. Each exercise was to be performed for 20 repetitions, 1-2 times per day, 4 days per week. The patient was provided with a written document with exercise instructions and dosage.

During the second week of therapy, the upper extremity exercises were progressed. This included latissimus dorsi pulldowns with 7 pounds of resistance, standing cable row with 3 kilograms of resistance, standing cable reverse fly with 3 kilograms of resistance, standing resisted trunk rotation with 2 kilograms of resistance,

and standing active range of motion using a 4-foot wooden dowel, also known as a “dowel routine.” The patient began radiation therapy during this time, so the exercise load and repetitions were kept low due to patient reporting reduced energy levels and tenderness in the breast and pectoralis major and minor. The patient was educated on energy conservation techniques. This was important because techniques such as taking breaks for rest, adjusting posture, performing activities one at a time, avoiding crowded areas, setting priorities, making lists, and avoiding or skipping activities that are not necessary and consume a lot of energy have been shown to improve cancer related fatigue.[14]

The patient presented with reduced pain and improved energy levels during the third and fourth treatment sessions. She reported her tenderness over the right breast and pectoralis major and minor decreased. The patient completed radiation therapy during the week of the third treatment session, which allowed an increase in difficulty in cardiovascular and strengthening exercises. The patient reported she purchased TRX straps. She was educated on bodyweight suspension training that provided progressions of upper extremity exercises that could be performed at home with the new straps. The exercises continued to have an emphasis on scapular stabilization, thoracic mobility, muscular endurance, and strengthening. The exercises that were added to the patient’s home exercise program included pushups and suspended rows with the TRX straps, each performed for 1-2 sets of 20 repetitions at least 4 days per week. The patient was instructed on how to position her body at different angles with the TRX straps in order to make the exercises easier or more difficult as she

progresses. The exercises were performed below the pain threshold with a goal of an overall reduction of pain symptoms and improved strength and exercise capacity.

During the fifth treatment session, the patient presented as fatigued and reported experiencing what she described as “zingers,” or deep pain and tenderness around the incision area and right breast tissue. In response to these symptoms, the patient was treated with soft-tissue mobilization of the right breast tissue, pectoralis major, pectoralis minor, and axillary fold. The patient tolerated these manual therapy techniques without an increase in pain symptoms. She performed her dowel routine and demonstrated improved coordination and thoracic rotation with the exercise.

Overall, the patient demonstrated tremendous compliance with the interventions performed during therapy appointments and exercises included within her home exercise program. She was motivated to progress during each therapy session, which played a vital role in her strength and endurance improvements throughout the physical therapy plan of care.

CHAPTER IV

OUTCOMES

The patient was reassessed during the 6th physical therapy treatment session for changes in her functional status and to evaluate the plan of care. Overall, the patient reported and demonstrated improvements in functional activities, pain, and mobility. Reassessment of the patient included objective and subjective outcome measures, as well as an assessment of goals, in order to evaluate the effectiveness of physical therapy interventions at this point in the plan of care. Objective measures included palpation and the Quick DASH, while subjective measures included patient reported pain and fatigue levels.

Following 5 treatment sessions, the patient stated she could perform most activities of daily living at home that were previously limited. These specific functional activities included loading and unloading the dishwasher, dressing, food preparation, carrying groceries, laundry, and pet care. Palpation of the right upper extremity was reassessed and presented as pain free in the right chest wall, axillary fold, the incision scar, and soft tissue of the pectoralis major and minor, triceps brachii, biceps brachii, and forearm extensors of the right arm. The patient reported general pain and fatigue were minimal.

The patient completed a second Quick DASH outcome measure. The patient improved in gross motor function, which included areas such as involvement in social and daily activities, arm, shoulder, and hand pain, and tingling in the right upper extremity. Although these improvements were made, the patient demonstrated more difficulty with areas that included fine motor skills and grip strength, including opening a

tight jar, household chores, and carrying a bag. This resulted in an unchanged Quick DASH score, as presented in Figure 3 below**.**

The patient reported and observed goals that were achieved included (1) the patient is able to perform household activities including loading/unloading the dishwasher, food preparation, and carrying groceries, (2) the patient is able to bend forward and reach to put on and take off shoes and socks, (3) the patient has no tenderness to palpation of the anterior right chest wall, axillary fold, around the incision scar, or the soft tissue of the pectoralis major and minor, biceps, triceps, and forearm extensors of the right arm, and (4) reduction of lymphedema of the axillary fold on the right side.

Goals that were not met included (1) a reduced Quick DASH score of 27.27/100, (2) the patient demonstrates equal pectoralis major/minor flexibility of the left and right upper extremity abduction and flexion, and (3) the patient is able to return to playing tennis. Factors that likely played in a role in these goals not being met are reduced grip strength as described earlier in this chapter, limitations of soft tissue structures around the breast tissue due to radiation therapy, and lack of endurance to return to playing tennis. The patient was expected to continue physical therapy to address continued impairments and meet further goals following the physical therapy student's departure.

Overall, the outcomes for the patient were favorable. Side effects from radiation therapy can occur early or develop months or years following treatment, which can create setbacks in recovery and require adjustments in the physical therapy plan of care.[15] The patient was compliant throughout the 6 therapy sessions and appeared to be satisfied with the overall physical therapy treatment and interventions.

1. Please rate your pain level with activity: NO PAIN = 0 1 (2) 3 4 5 6 7 8 9 10 = VERY SEVERE PAIN

2. How satisfied are you with the level of care and service provided?
(1) **Very Satisfied** (2) **Satisfied** (3) **Unsatisfied** (4) **Very unsatisfied**

3. Please rate your progress with functional activities from start of therapy to present:
(1) **Excellent** (2) **Good** (3) **Fair** (4) **Poor**

4. At this point in your treatment, have your therapy goals been met?
(1) **Completely Met** (2) **Mostly Met** (3) **Partially Met** (4) **Not Met**

Please rate your ability to do the following activities in the last week by circling the number below the appropriate response.

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar	1	2	3	(4)	5
2. Do heavy household chores (e.g., wash walls, floors).	1	2	(3)	4	5
3. Carry a shopping bag or briefcase.	1	(2)	3	4	5
4. Wash your back	1	(2)	3	4	5
5. Use a knife to cut food.	(1)	2	3	4	5
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand(e.g., golf, hammering, tennis, etc.).	1	(2)	3	4	5
	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
7. During the past week, to what extent has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbors or groups?	1	(2)	3	4	5
	NOT LIMITED AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	1	(2)	3	4	5
Please rate the severity of the following symptoms in the last week. (circle number)	NONE	(MILD)	MODERATE	SEVERE	EXTREME
9. Arm, shoulder or hand pain.	1	(2)	3	4	5
10. Tingling (pins and needles) in your arm, shoulder or hand.	1	(2)	3	4	5
	NONE	MILD	MODERATE	SEVERE DIFFICULTY	SO MUCH DIFFFICULTY THAT I CAN'T SLEEP
11. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand? (circle number)	(1)	2	3	4	5

$\frac{23}{11} - 1 \times 25 = 27.27$

Figure 3. Updated Disabilities of the Arm, Shoulder, and Hand Score (Quick DASH).

CHAPTER V

DISCUSSION

This case report was developed to demonstrate the effects of physical therapy intervention in a patient status post lumpectomy following a diagnosis of breast cancer and the completion of chemotherapy and radiation therapy. Physical therapy can be used to reduce pain, prevent and treat lymphedema, provide exercise programs to promote strength and flexibility, and provide education for patients with breast cancer.[16] Research shows that multifactorial physical therapy (i.e. stretching, exercises) and active exercises are effective to treat postoperative pain and impaired range of motion following treatment for breast cancer.[6] The primary concern of the patient presented in this case report was the inability to perform specific functional activities of daily living. As stated, there were two main considerations for this patient while developing the plan of care. These included lower energy levels and fatigue, as well as pain and tenderness in the right upper extremity and chest wall. These factors, along with the continued side effects of radiation therapy, caused the patient to present to therapy at different functional levels, which guided decisions for individual treatment sessions and exercise progressions. Over the course of the physical therapy plan of care, the patient made improvements in gross motor skills and activities that were previously limited, as measured by and demonstrated in the Quick DASH outcome measure. The outcomes in this case report indicate that a combination of cardiovascular activity, upper extremity strengthening, scapular stabilization, thoracic mobility exercises, and soft tissue mobilization are effective in treating a patient status post lumpectomy and following chemotherapy and radiation therapy.

The patient's level of motivation and compliance played a large role in her progress and improvements throughout the plan of care. The patient was motivated to return to her prior level of function and the social activities she participated in, such as playing tennis. The treatment goals that were developed were patient centered and emphasized the return to functional activities.

There were limitations in this case study that need to be addressed to support physical therapy intervention following breast cancer treatment. A more thorough initial evaluation that included specific measurements would have provided more accurate, descriptive, and objective values that would be used to determine the outcomes of the treatment interventions. This would include exact measurements using a tape measure of lymphedema in the axillary fold and numerical goniometric measurements specifically for upper thoracic extension and side bending, as well as a numerical pain scale. By incorporating these components, more detailed outcome measures could have been analyzed by the therapist. It would have also been beneficial to assess the patient's level of fatigue with a fatigue severity scale. Cancer-related fatigue is commonly experienced by patients during the period of cancer and treatment.[14] Since the patient was completing radiation therapy during the course of the physical therapy plan of care and fatigue was a component that influenced clinical decisions regarding progressions of therapy interventions, it would have been beneficial to include a fatigue severity scale to measure the effects of physical therapy in this area. The length of physical therapy intervention was also a limitation in this case report. Due to the length of the student's clinical experience, the student was unable to see the long-term results of the physical therapy interventions.

Reflective Practice

Other important components would be taken into consideration if this case study were to be repeated. These include incorporating soft tissue mobilization, or myofascial release, earlier in the plan of care. Although this intervention was included, it was not performed until the fifth treatment session. Scars from a mastectomy or lumpectomy can cause postural deformities, including forward head and rounded shoulders, leading to further neck and shoulder pain or impingement. Myofascial release can lead to restoring posture and alignment and improve lymphedema.[17] It would have been beneficial to introduce soft tissue mobilization techniques at the beginning of the patients plan of care.

Further research is recommended to assess the long term results of the physical therapy interventions demonstrated within this case report, as there are long-term and late side effects associated with breast cancer treatment.[18] Suggestions for future studies include assessment of fatigue and exercise capacity over the course of physical therapy treatment and further investigation of the effects of early manual therapy techniques in addition to strength and endurance training in patients following breast cancer treatment.

In conclusion, this case report describes the physical therapy plan of care that was developed for a patient status post lumpectomy and completion of chemotherapy and radiation therapy. An outline of the clinical reasoning and considerations that were taken into developing and progressing interventions were described in detail, along with the effects of physical therapy treatment. Although the interventions chosen produced positive outcomes, further research is recommended.

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