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A Case Study: Adhesive Capsulitis after Breast Cancer Surgery

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A Case Study: Adhesive Capsulitis After Breast Cancer Surgery

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This Scholarly Project, submitted by Kelsey Kratzke 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.

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Signature Kelsey A Kratzke

Date 6-15-16

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ABSTRACT

Purpose: The purpose of this case report was to outline the physical therapy interventions and factors affecting rehabilitation of a patient with adhesive capsulitis following breast cancer surgery.

Case Description: A 65 year-old female, with limited range of motion in the right shoulder and right anterior chest pain, was seen at an outpatient physical therapy clinic. Past medical history included unilateral right mastectomy, right lymph node dissection, and chemotherapy. The physical therapy examination and patient history led to the diagnosis of adhesive capsulitis of the right shoulder and fibrosis of the anterior chest wall musculature.

Plan of Care: The patient came to therapy 2-3 times a week for 12 weeks. Interventions included strengthening and stabilization activities for the shoulder and scapular muscles, gleno-humeral joint mobilization, a home exercise program, and patient education. The primary outcome measures were PROM, pain ratings, MMT, and the Focus On Therapeutic Outcomes (FOTO), a functional assessment.

Outcomes: After 12 weeks of intervention, passive and active range of motion (PROM and AROM) increased, shoulder and scapular muscle strength increased, and pain decreased. Overall, she had an increase in her functional mobility via the FOTO assessment.

Discussion: The results of this study focused on intervention options for breast cancer survivors and how to help them cope with their injury. Further education may need to be given to health professionals and patients following surgery to prevent shoulder dysfunction.

CHAPTER I

BACKGROUND AND PURPOSE

According to the American Cancer Society,[1] approximately 12% of all women in the United States will be diagnosed with invasive breast cancer in their lifetime. The average age of women diagnosed with breast cancer in the US is 61 years of age. As women age, they have an increased risk of developing breast cancer due to abnormal changes happening within certain cells. Many other risk factors increase the incidence of breast cancer including post-menopausal hormone therapy, oral contraceptives, family history, regular alcohol consumption and ethnicity.[2] The rates of mortality have been declining the last 25 years due to increased screening techniques and improved treatment options, but many women still suffer from complications following treatment.[3]

Surgery is the primary way of treating breast cancer, consequently it yields a high rate of upper limb dysfunctions. Beursken et al[4] conducted research, with patients who have surgical intervention for breast cancer, which was focused on the treatment of limitations in shoulder range of motion (ROM), increased pain, and improving the quality of life for patients follow breast cancer surgery. Resulting in patient outcomes of decreased pain, increase in ROM and improvement in quality life. De Grof and colleagues[5] also concluded that physical

therapy and active exercise are effective in treating impairments of shoulder ROM and pain following breast cancer surgery.

No evidence was found indicating the most effective time to begin therapy following breast cancer surgery. According to Mcneely et al,[6] clinicians, who have less concern about the amount of drainage from the breast tissue that may occur due to early ROM, may want to opt for early upper-limb exercises; whereas, clinicians, who have more concern for increased drainage, may opt for delayed upper-limb exercises.

Physical therapy interventions implemented in this case study mitigated the potential for upper limb dysfunction. The purpose of this case report was to outline the physical therapy interventions and factors affecting rehabilitation of a patient with adhesive capsulitis following breast cancer surgery.

CHAPTER II

CASE DESCRIPTION

The patient was a 65 year-old, well-educated, Caucasian female. She had 2 grown children and lived in a one-level home with her husband and niece, where she was the main caregiver. She was retired from child care services and enjoyed 30 minute walks several days a week, travel, and frequent dinners out with her family and friends. The patient had a history of smoking, but quit 5 months prior to starting therapy.

The patient was referred to physical therapy by her oncologist with a diagnosis of adhesive capsulitis. The patient presented with decreased range of motion (ROM) in her right upper extremity and pain in her right shoulder and anterior chest. Five months prior to physical therapy, the patient was diagnosed with invasive lobular carcinoma, stage 1, breast cancer of the right breast tissue. Invasive lobular carcinoma is cancer that begins in the skin and spreads to the breast tissue.[7] Stage 1 is defined as cancer that has invaded up to three lymph nodes.[8] Due to the aggressiveness of this type of cancer, the patient had a right mastectomy and lumpectomy 2 months after being diagnosed. The patient also received chemotherapy due to the cancer having spread to the lymph nodes.

With the exception of smoking and breast cancer, the patient had no other significant past medical history. The patient was on Arimidex to help prevent

reoccurrence of breast cancer. This medication decreases the ability for tumors to grow in post-menopausal women, thus limiting the likelihood of reoccurrence of breast cancer. Some side effects of this medication are decreased bone density, joint stiffness, increase risk of osteoporosis, and numbness.[9] These adverse effects put the patient at an increased risk for fractures and injury. However, the patient did not report any side effects from the medication and was monitored for signs and symptoms by the physical therapist while the patient came to physical therapy.

For 2 ½ months after surgery, the patient maintained a guarded position and did minimal movement of her right upper extremity due to pain and fear of reopening the incision site. This resulted in decreased ROM in the right shoulder and fibrosis of the anterior chest wall musculature. Limitation in ROM inhibited the patient's ability to complete activities of daily living (ADL's) such as reaching overhead, sleeping, completing household duties, washing her hair, cooking, and getting dressed. The patient reported the pain and loss of motion gradually increased over time and she finally sought out medical attention when the loss of motion and pain were too intense to ignore.

During the examination, the patient presented with psychological factors that affected her daily life. There were multiple moments where she neglected to look at her right chest or would talk about being embarrassed to go out in public. The patient expressed concern about her deformity and the time frame it would be until she was a candidate for breast reconstruction. Since it is not within the

scope of practice for a physical therapist to provide psychological counseling, the physical therapist referred her to multiple support groups to help cope.

Examination, Evaluation and Diagnosis

Upon initial examination, the patient filled out a functional assessment for the shoulder called Focus On Therapeutic Outcomes (FOTO).[10] This assessment calculated the current level of impairment and predicted the level of impairment at discharge. FOTO has an internal consistency reliability ranging from 0.57 to 0.89 indicating that all questions on the assessment were adequately measuring the same impairment.[11] At the examination, the patient was 43% impaired and was predicted to be 29% impaired by the time of discharge. After filling out the functional assessment, the physical examination began.

During the systems review, the cardiovascular and pulmonary systems presented in normal physiologic status. When inspecting the patient's integumentary system, the patient displayed stiff and hypo-mobile tissue of the right anterior chest wall, lateral segment of right rib cage, right axillary region, and incision site. The patient had pink and purple coloring at the incision site indicating the tissue was in the proliferation to maturation phase of healing. There were no signs of infection at the surgical site and it appeared to be healing properly. The patient reported tenderness over the scar and axillary region upon palpation.

In the axillary region, the patient was developing Axillary Webbing Syndrome (AWS) which can be very tender and is illustrated in Figure 1. AWS is

a cord-like structure that commonly occurs in the axillary region following a lumpectomy or mastectomy.[12] The cording can extend from the rib cage all the way to the forearm causing limitations in shoulder range of motion. The etiology of this disease is unknown at this time, but affects up to 72% of women that undergo axillary node dissection.[12]

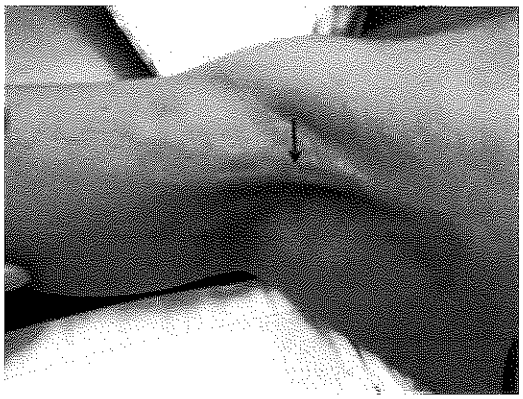

Fig. 1 Axillary Webbing Syndrome: A visible cord[13]

The patient's pain level was measured using the Numeric Pain Rating Scale (NPRS). The NPRS has an excellent test-retest reliability when performed more than two times a week (R = 0.79-0.92).[14] The patient was asked to report current level of pain, level of pain at rest, and worst pain in the last 24 hours at every therapy session. The numeric pain scale is a 0-10 scale with 0 being no pain and 10 being the most severe pain imaginable. The patient reported pain in her right shoulder and right anterior chest wall of 5/10 both currently and at rest and 9/10 at worst. Pain was mainly elicited with motion above 90 degrees of the right shoulder and palpation of the scar on the right chest wall.

The patient's shoulder ROM was assessed using a goniometer to determine how significant the deficits were and if there were signs and symptoms

of adhesive capsulitis. The patient's shoulder PROM was within normal limitations for the left, but not the right which are illustrated in Table 1. The limitations in right shoulder ROM followed the capsular pattern of the gleno-humeral joint which was a positive indication of adhesive capsulitis.

Table 1
PROM values at initial evaluation

Shoulder PROM	**Right**	**Left**
Flexion (Normal = 180 degrees)	133 degrees	177 degrees
Abduction (Normal = 180 degrees)	90 degrees	175 degrees
External Rotation (Normal = 90 degrees)	43 degrees	87 degrees
Internal Rotation (Normal = 70 degrees)	52 degrees	66 degrees

The patient demonstrated strength deficits when performing functional movements with the right upper extremity. A clinical manual muscle test (MMT) was performed for the motions of the right and left shoulders to determine the extent of the loss of strength. The MMT confirmed the loss of strength in the right shoulder and concluded the degree of severity as seen in Table 2.

Table 2
MMT values at initial evaluation

Shoulder MMT	Right	Left
Flexion	4-/5	5/5
Abduction	4-/5	5/5
External Rotation	4+/5	5/5
Internal Rotation	5/5	5/5
Extension	Unable to Test Due to Pain	5/5

Since this patient had multiple lymph nodes removed, circumferential measurements were taken of both upper extremities to determine if the patient was developing lymphedema. Taylor et al[15] concluded that arm circumferential measurements using anatomical landmarks are valid and reliable measurements for arm volumes and are more accurate than measurements taken via distances from the fingertip. Measurements were taken bilaterally using a vinyl tape measure at different anatomical landmarks as seen in Table 3. Each measurement was taken in a supine position. The patient did not have consistent swelling in her upper extremities indicating the patient had a decreased likelihood of having lymphedema, but would be required to monitor for changes for the rest of her life.

Table 3
Circumferential measurements at initial evaluation

Location of Measurement	Right	Left
DIP of Middle Finger	5.6 cm	5.2 cm
MCP Joint	18.7 cm	18.8 cm
Distal Radio-Ulnar Joint	15.6 cm	16.6 cm
10 cm Proximal to Radio-Ulnar Joint	20.3 cm	18.1 cm
Antecubital Fossa	25.8 cm	26.3 cm
10 cm Proximal to Antecubital Fossa	29.8 cm	29.6 cm
Axillary Region	41.2 cm	40.6 cm

The diagnosis of adhesive capsulitis was confirmed following a review of the patient's functional assessment, a decrease in shoulder mobility, and tenderness upon palpation of right anterior chest wall and right axillary region. These changes in musculoskeletal structures of the right chest wall and shoulder resulted in the loss of function for the patient. Interventions were designed to increase mobility of the right shoulder and decrease the build-up of scar tissue to help promote functional use of the right upper extremity.

Prognosis and Plan of Care

After evaluating all of the data, the physical therapist determined that the patient could benefit from physical therapy services. The physical therapist concluded the patient had a fair prognosis of returning to prior level of function based on the time it took for the patient to seek physical therapy and her past medical history. The initial plan of care was to have the patient come to physical therapy 2 times a week for an hour each session for 6 weeks.

The patient's short-term goals included understanding signs/symptoms of lymphedema, demonstrating independence with home exercise program to allow for progression, improving ROM of the right shoulder, and demonstrating independence with self-massage of the right chest wall to increase scar mobility. The patient's long-term goals included having full ROM in right shoulder, demonstrating improved posture and biomechanics of both shoulders, and reporting pain of no greater than 2/10. The patient was re-evaluated at 3 weeks and 6 weeks to determine if the patient was ready for discharge.

To help reach the patient's goals, the plan of care included utilization of tissue mobilization to address fibrosis of scar and right chest wall. The other interventions included mobilizations of gleno-humeral joint, strengthening, stretching, and education about proper body mechanics and posture to maximize return to full and pain-free function. The patient also received lymphedema education and a home exercise program to facilitate achievement of goals.

For the patient to be discharged, all goals needed to be met and the patient needed to be independent with ADL's and her home exercise program. If

the patient's goals were not met, re-evaluation of the plan of care would occur and the therapist would make a recommendation regarding the benefit of continuing physical therapy.

Intervention

The interventions were designed to increase ROM and strength as well as decrease pain. The patient was informed of the plan of care and approved of all interventions that would possibly be used during each treatment. Each treatment session was approximately an hour long which included warm-up for 10 minutes, manual therapy for 25 minutes, and therapeutic exercise for 25 minutes. Alterations to the interventions were made during the treatment sessions depending on the patient's pain and motivation.

Every treatment session began with the patient completing 10 minutes either on the upper body ergometer or lying supine with a hot pack over the right anterior chest and right shoulder. It was important for the tissue to be warm and pliable prior to starting the manual therapy otherwise there could have been adverse reactions to the treatment.

The manual treatment usually started with the patient doffing her shirt and bra and laying supine on the plinth. The patient was properly draped and verbally confirmed feeling comfortable with the draping. At this time, the physical therapist would check to see if the scar was healing appropriately and palpated for any changes in the tissue of the chest and axillary region.

The first intervention performed was fascial mobilizations to the scar, right anterior chest wall, and axillary tissue. This form of treatment was used to break up the fibrosis and cording. This increased the tissue mobility in an attempt to improve shoulder range of motion. The patient was instructed and educated on how to perform this mobilization so she could complete this procedure independently. The patient was most compliant with this intervention after a long, hot shower.

The final manual therapy technique used during a treatment session was right gleno-humeral joint mobilizations. The gleno-humeral mobilizations were initially performed at grade I-II to allow the patient to become comfortable with the intervention and to alleviate any pain. After the first week of treatment, the mobilizations were performed at grade III-IV to break up the adhesions in the gleno-humeral joint as well as stretch out the capsule. The mobilizations were performed in an anterior, inferior, and posterior direction. Each mobilization was performed 2 times for 2-3 minutes.

Once the manual therapy was completed, the patient donned her clothes and moved out to the gym to perform therapeutic exercises. First, stretching of pectoralis major, pectoralis minor, and shoulder external rotators was performed. Each stretch was held for 30 seconds and was performed for 3 repetitions a session. The pectoralis muscles were stretched at 30 degrees, 90 degrees, and 120 degrees of abduction to target both the sternal and clavicular muscular heads. The external rotator muscles were stretched by laying in a sideline position on the plinth with arm abducted to 45 degrees, elbow flexed to 90

degrees and the opposite hand adding over pressure into internal rotation. The patient was instructed to perform these stretches at home to help maintain the increased ROM achieved at therapy.

The remaining time was spent on strengthening exercises for the scapular and shoulder girdle muscles. During the first 2 weeks, the strengthening exercises included: internal and external rotation while standing using yellow theraband, scapular retraction with yellow theraband at 45 degrees, 90 degrees, and 135 degrees of abduction, seated rows with 5 pounds in each hand, and body blade at 90 degrees of flexion and abduction. The patient performed each exercise 10 times and completed 2 sets during a session, with exception of the body blade, for which she completed 30 seconds in each position, 2 times a session.

The patient was progressed in these exercises by increasing the sets, resistance, or time. By the time the patient was discharged from therapy, she was completing 3 sets of 10 repetitions with all exercises, using a green theraband with the exercises, and progressed to 30 pounds when rowing. Strengthening exercises were not added to the home program till the fourth week and included shoulder internal and external rotation as well as scapular retraction.

Outcomes

After 6 weeks of physical therapy, the patient was showing improvement in pain and shoulder ROM. Her PROM of the right shoulder was 140 degrees of flexion, 130 degrees of abduction, 45 degrees of external rotation, and 90 degrees of internal rotation. The patient also had a decrease in pain to a 0/10 at rest and a 5/10 at worst (pain increased with activities), which was better than at the initial evaluation. The patient's FOTO score did not change, which was not consistent with the patient's report of increased motion and decreased pain. Since the patient did not achieve her long term goals at the 6 week re-evaluation, the patient's plan of care was revised and extended for an additional 6 weeks.

The patient was re-evaluated at 12 weeks and showed significant improvement. The patient reported 0/10 pain at rest and 2/10 pain at worst (with activity) which met her long term goal of a 2/10 or less pain with activity. The patient had full right shoulder PROM in all directions and functional AROM in the right shoulder. The patient also had an increase in strength: shoulder flexion and abduction were 4+/5 and shoulder external rotation and internal rotation were 5/5. The patient's FOTO score improved to 20% impaired which was more than a 50% improvement from her initial evaluation.

Progression toward her goals was possibly inhibited due to the duration of time since surgery, the severity of adhesive capsulitis, and the decreased adherence to home exercise program. Overall, the patient responded well to therapy and was more compliant as therapy progressed, which led to significant gains in function.

CHAPTER III

DISCUSSION

When patients are diagnosed with breast cancer, the emphasis of treatment is on eliminating the cancer and preventing it from reoccurring. This may result in the patients not realizing the musculoskeletal complications that may arise following breast cancer surgery including possible upper extremity dysfunctions. In the study performed by Engel and colleagues,[16] upper extremity dysfunctions following breast cancer surgery were significant factors contributing to a decrease in quality of life. Ewertz and Jensen[17] suggested using screening tools, specific goals for rehabilitation, and continuing research to alleviate symptoms and increase quality of life for these patients.

With breast cancer patients being at an increased risk of developing upper limb impairments, it is important that health care providers monitor these patients for signs and symptoms of dysfunction. In a 2011 study, Harrington et al[18] found that shoulder function, ROM, and strength were clinically important in determining severity of impairment in breast cancer patients. Once the dysfunction was determined, a combination of stretching, strengthening, and soft tissue mobilization was recommended to aid in reducing pain, increasing shoulder ROM and quality of life.[4]

Scaffidi et al[19] observed 83 females, who underwent breast cancer surgery, to determine the impact of surgery on upper limb function. They also wanted to evaluate the effects of an early rehabilitation program on upper limb function. Twenty-five of the women in this study did not begin physical therapy interventions while in the hospital and 58 of the participants received physical therapy treatment while in the hospital. The researchers compared shoulder mobility, function, and presence of lymphedema between groups at 1 month, 2 months, and 4 months. The authors concluded that early rehabilitation in conjunction with written precautionary measures were crucial in minimizing the occurrence of upper limb dysfunctions.

Torer et al[20] found that the psychological status of breast cancer patients affected their post-operative recovery. Patients with high anxiety and depression rates were more likely to have an increased hospital stays following breast cancer surgery. In a 2008 study, Fann et al[21] found that women who had breast cancer surgery were at an increased risk of developing Major Depressive Disorder which frequently correlated with a decrease in quality of life.

Saini et al[22] investigated the quality of care and satisfaction of breast cancer patients whose health care team used a multidisciplinary approach to treatment. Although there are many different multidisciplinary models used across the world, the authors found that there was a higher patient satisfaction rating as well as improved quality of care when health care teams used a type of multidisciplinary care.

The evidence referenced indicated the need for physical therapy treatment as well as psychological treatment in patients who have had breast cancer surgery. There is a wide variety of both physical and mental interventions that would be appropriate to help increase the patient's quality of life. Based on this evidence, it is also recommended that a multidisciplinary approach be established to promote positive outcomes and a better patient experience following surgery.

Reflective Practice

When reflecting on the patient's presentation and course of treatment, I would have referred her to a professional psychologist rather than solely a support group. During therapy sessions, the patient demonstrated psychological distress about the deformity of her right chest and, at points, would not even look at or touch her scar. These abnormal behaviors required more psychological support than what is within a physical therapist scope of practice. I should have been more attentive in making sure she received appropriate psychological support rather than only providing her with options.

Another area I could have improved on was creating a closer professional relationship with the patient's physician and oncologist. I sent the physician an update via email once at the 6 week point to request extra sessions otherwise I did not have contact with the physician. I should have been in contact with the physician and oncologist more frequently to keep them updated on the physical

and psychological findings. These relationships would have promoted positive outcomes and a better patient experience following surgery.

I also could have provided education to the health professionals working with this population about the increased risk of upper limb dysfunction following breast cancer surgery. Had this education been provided to this patient sooner, the patient may have come to physical therapy more quickly and with decreased severity of her shoulder dysfunction. Increased collaboration between health care disciplines could have led to an increased quality of life for the patient and more focused patient care. In the future, I will be in contact with my patients' health care team on a more regular basis and refer to appropriate professionals to further improve the patient's quality of life.

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