



# **The Efficacy of Physical Therapy Rehabilitation Program for Women Following a Modified Radical Mastectomy: A Case Report**

**Vibhuti Gaur<sup>1</sup>, Shruti Deshpande<sup>2\*</sup> and Tasneem Burhani<sup>2</sup>**

<sup>1</sup>Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Sawangi Meghe, Wardha, India.

<sup>2</sup>Department of Community Health Physiotherapy, Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Sawangi Meghe, Wardha, India.

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Background:** The most commonly identified cancer is breast cancer. In either the lobules or the breast ducts, the cancer normally grows. Infiltrating ductal carcinoma is the most common subtype. It may appear as a lump or mass; changes in the skin or nipple; breast rash or redness; or lymphadenopathy.

**Presenting Complaints and Investigations:** the patient presented with the complains of swelling and pain in the left breast in lower outer quadrant since 6 months, which was initially small in size and gradually increased and reached up this level 2x2 cm which placed in infra areolar region covering lower inner and outer quadrant. USG and cytology reports showed bilateral breast with axilla. Right breast was normal, enlarged lymph node in the right axilla measuring 15.2 x 4.6 mm with maintained hilum S/O reactive lymphadenopathy. In left breast there is E/O ill-defined taller than wider irregular hypoechoic lesion with spiculated margins, measuring approximately 15.9 x 12.4 mm in lower inner quadrant containing multiple foci of calcification within showing central

\*Corresponding author: E-mail: shruti.rnpc@dmimsu.edu.in;

vascularity OB doppler on elastography lesion is stiff, in left axilla there is E/O on enlarged USG lymph node present measuring 10.2 x 6.7 mm with maintained hilum S/O reactive lymphadenopathy. Impression of F/S/O malignant lesion in the left breast lymphadenopathy.

**Diagnosis:** Left sided infiltrating ductal carcinoma.

**Therapeutic Intervention and Outcomes:** Physical therapy intervention involved a variety of range of motion exercises, strengthening exercises, resistance conditioning, breathing exercises, lymphoedema treatment and scar management. This intensive outpatient program is a successful way to enhance the mobility of the shoulder and ROM during the initial 6-week treatment cycle after surgery. Shoulder range of motion was increased, patient was able to do basic activities of daily living like dressing, bathing, combing, etc. Edema was reduced.

**Conclusion:** Shoulder stiffness after modified radical mastectomy is the commonest complication. Upper limb mobility exercises reduced the shoulder stiffness. Breathing exercises improved the respiration. Strengthening and general aerobic exercises helped the patient to get back on her normal routine.

**Keywords:** Breast cancer; infiltrating ductal carcinoma; exercises, edema; strengthening; shoulder stiffness.

## 1. INTRODUCTION

Breast cancer is the most frequently diagnosed female cancer and ranks second among the cancer causes of death in women [1]. Cancer of the breast is a cancer that occurs in the cells of the breast [2]. In either the lobules or the breast ducts, the cancer normally grows [3]. In situ, ductal carcinoma is the most common subtype (DCIS). In the mammary ducts, this type of cancer initiates and invades fatty tissues inside the breast. It may appear as a lump or mass; changes in the skin or nipple; breast rash or redness; or lymphadenopathy [4]. With the rise in age at first birth, the incidence of breast cancer increased; this impact was not compensated for by parity. Early age at first birth tended to reduce the risk as opposed to no pregnancy, while late age at first birth was linked with a higher risk than not getting full-term pregnancy. Late menarche age was associated with a lower risk among premenopausal women but not among postmenopausal women. In comparison to non-pregnancy, early age at first birth tended to decrease the risk, whereas late age at first birth was associated with a higher risk than full-term pregnancy. Late menarche age in premenopausal women was associated with a lower risk, but not in postmenopausal women.

The risk was smaller for postmenopausal women than for premenopausal women of the same age and increased during menopause with increasing age; the risk for bilateral oophorectomy was lower than for hysterectomy alone [5]. Separately, a positive history of benign breast disease and a positive family history of breast cancer have all

been attributed to an increased risk of breast cancer. 1,671,149 new breast cancer cases were registered and 521,907 deaths from breast cancer occurred worldwide in 2012. According to GLOBOCAN, it is the most common cancer in women, accounting for 25.1 percent of all cancers. In developing nations, the incidence of breast cancer is higher, while the relative mortality is highest in less developed countries [6].

## 2. CASE DESCRIPTION

This case involves a 28 years old female, resident of Deoli village, Wardha district, presented with complains of swelling and pain in the left breast in lower outer quadrant since 6 months, which was initially small in size and gradually increased and reached up this level 2x2 cm which placed in infra areolar region covering lower inner and outer quadrant. The lump was also with piercing pain with intensity 7/10 on VAS. There is no relevant family history. Patient is also a known case of hypoplastic ovaries [7] which resulted in menstrual irregularities, cycle of 3 months which lasted upto 3 days with scanty flow. With these complains she visited AVBRH where investigations like USG, CBC, LFT, KFT, and RBS tests were done. USG and cytology reports showed bilateral breast with axilla. Right breast was normal, enlarged lymph node in the right axilla measuring 15.2 x 4.6 mm with maintained hilum S/O reactive lymphadenopathy. In left breast there is E/O ill-defined taller than wider irregular hypoechoic lesion with spiculated margins, measuring approximately 15.9 x 12.4 mm in

lower inner quadrant containing multiple foci of calcification within showing central vascularity OB doppler on elastography lesion is stiff (strain ratio = 8), in left axilla there is E/O on enlarged USG lymph node present measuring 10.2 x 6.7 mm with maintained hilum S/O reactive lymphadenopathy. Impression of F/S/O malignant lesion in the left breast lymphadenopathy. Patient was managed conservatively on Tab EFEM 1000 mg once a day, Tab ZIFI 200mg twice a day, Tab PANAPRAZOLE 40 mg once a day, Tab DICLOMOL SP twice a day, Cap BECOSULE once a day, Tab LIMCEE once a day. On 8<sup>th</sup> January 2021 sector mastectomy [8] of left breast was done and the tissue piece was sent to pathology department. The histopathology reports showed suggestive of infiltrating ductal carcinoma. On 26<sup>th</sup> January 2021 left sided modified radical mastectomy was performed [9]. From 27<sup>th</sup> January 2021 physiotherapy treatment was started.

### 2.1 Timeline

6 months back patient visited AVBRH with the complains of lump in the left breast in lower outer quadrant. Here investigations like ultrasonography, CBC, LFT, KFT were done. After this patient was managed conservatively on medications. On 8<sup>th</sup> January 2021 sector mastectomy was performed and the tissue piece was sent to the pathology department. On 12<sup>th</sup> January 2021 the histopathology reports showed suggestive of infiltrating ductal carcinoma. On 26<sup>th</sup> January 2021 modified radical mastectomy was done and from 27<sup>th</sup> January 2021 physiotherapy treatment was started.

### 2.2 Diagnostic Methods

On examination: Left breast: 2x2 cm globular lump palpated at infra areolar region covering lower outer and inner quadrant of left breast with tenderness, normal temperature and without any nipple retraction, dimpling, puckering or Peau'd orange appearance. No E/O any engorged vein or ulcer over the surface. NAC: Normal in shape size and Montgomery's tubercles are visible. No E/O edema over arm and visible or palpable swelling noted in left axilla and supraclavicular fossa. Right breast and axilla: appeared normal and confirmed by palpation. Left breast sutures line in situ no gape or discharge.

### 2.3 Investigations

#### a) USG

- bilateral breast with axilla.
- Right breast: Normal
- Right axilla: E/O enlarged lymph node in the right axilla measuring 15.2 x 4.6 mm with maintained hilum S/O reactive lymphadenopathy.
- Left breast: There is E/O ill-defined taller than wider irregular hypoechoic lesion with spiculated margins, measuring approximately 15.9 x 12.4 mm in lower inner quadrant containing multiple foci of calcification within showing central vascularity OB doppler on elastography lesion is stiff (strain ratio = 8)
- Left axilla: E/O on enlarged USG lymph node present measuring 10.2 x 6.7 mm with maintained hilum S/O reactive lymphadenopathy.
- Impression: F/S/O malignant lesion in the left breast lymphadenopathy.

#### b) Cytology

- USG guided FNAC from lower outer quadrant.
- F/S/O fibrocystic changes with fibroadenosis.
- No malignant cell seen.

#### c) Histopathology

- Received single, irregular, yellowish brown tissue piece measuring 5 x 3.8 x 2.5.
- On cut section homogenous area identified measuring 2 x 1.3.
- Section from given tissue piece shows histopathological features suggestive of infiltrating duct carcinoma (NOS).
- BR score = 7 (grade 2)

### 2.4 Physiotherapeutic Diagnostic Methods

#### • Girth measurement

Edema present.

### 2.5 Therapeutic Interventions

Exercise is a big part of the breast cancer care and rehabilitation following surgery. It helps to improve upper limb muscle strength [10] shoulder pain and joint stiffness [11] and helps to get back in your normal routine.

General guidance for the creation of a successful workout regimen:

- Wear loose and comfortable clothing.
- Breathe regularly and thoroughly when you do each workout.
- Exercise before a gentle stretch is felt, not pain.
- Contact the doctor if you have any unusual swelling or pain.

#### ▪ Day 1 to day 7

These exercises are done when the drain is still placed.

1. Breathing exercises: try to sit and then breathe from your nose slowly and deeply. Like a balloon, stretch the chest and stomach. Do not strain your back or spine. Relax and breathe out of your mouth gently and fully. Repeat 7-10 times like this.
2. Pumping movements for the upper limb: sit with arms balanced on the chair and encourage the patient to open and close the hand 10-15 times.
3. Shoulder shrugs: bring both your shoulders to your head. Hold the chin slightly tucked in. Keep it for 3 to 5 seconds, then lower it slowly for 5 seconds and relax. Repeat 5-10 times like this.
4. Active flexion of the shoulder: ask the patient to clasp the hand in front of the chest and raise the arms upwards gently until a soft stretch is felt.

#### ▪ Week 2 to week 6

Once the drain has been removed, it is mandatory to try to get back the full use of the shoulder.

Begin with the above exercises with 15-20 repetitions.

Once the patient feels stronger progress to the advance exercises

1. Wand exercises: You would use a wand or a broom handle or a stick or cane for this exercise. Ask the patient to sit with his legs crossed on his stomach. For both hands, hold the handle, the palms facing downward, and the hands should be separated by shoulder width. Keep and drop your arm for 3-4 seconds. Repeat 5-10 times like this.

2. Wall climbing: It is possible to perform this exercise in 2 ways, facing the wall or the impacted side of the wall.

Facing the wall: ask the patient, about 2 inches apart, to stand facing the wall. Place both hands at shoulder level on the wall.

Using the fingertips until she feels a stretch to crawl up or fall as far as she can go. Back to the starting position. Repeat 5-10 times like this.

Side wall stretch: stand up against the wall on your impacted side, approximately 2 feet out from the wall, so you can brush your fingertips on the wall. Walk up the wall with your fingers, like you're facing the wall. Do not rotate the wall against the body. Decrease and repeat 5-10 times.

3. Snow Angels: Lay on the back and stretch out the ends of the arms. Shift your arms above your shoulders, finally brush your fingertips, and back down to your thighs. 3-5 times to repeat.

#### ▪ After week 6

If the patient feels better, she will start performing encouragement and general health conditioning exercises progressively.

1. Strengthening: Delaying the return of household tasks, planting or yardwork are some of the ways in which resilience can be created. Patients should start doing strengthening exercises with light weights within 6 weeks of surgery.

2. Overall conditioning: The general physical state is enhanced by daily aerobic activity. Any examples of aerobic workouts include fast walking, swimming, running.

Outcome: shoulder movements and strength were regained. Patient was able to perform activities of daily living [12].

### 3. DISCUSSION

There is statistically significant improvement in ROM, chest expansion, and reduction in pain with physiotherapy postmastectomy. Post-

operative pain was mainly at a site of incision. Movement of the arm pulls on the incision and is uncomfortable for patient. There is reduction in pain as gradually healing takes place post-operatively and with exercise the pectoral muscles loosens along with mobilization of scar leads to reduction in NRS score. There is a reduction in chest expansion because of incisional pain and decrease shoulder girdle movement [13] In modified radical mastectomy, as there was preservation of pectoral muscle,

they are muscle of respiration. The pain reduces gradually as well as the tightness of pectoral muscles reduces with exercises which help in improving chest expansion. It is clear that the speed and depth of respiration are enhanced during intense or sustained exercise. Impaired ROM of shoulder joint [14] is due to incisional pain that causes the muscle guarding and tenderness of shoulder joint. Fibrosis of soft tissues in the axillary region in which adherence between muscles, subcutaneous.

**Table 1. Manual muscle testing: left side**

Muscle group	Grades
1. Shoulder flexors	Grade 2
2. Shoulder extensors	Grade 3
3. Shoulder abductors	Grade 2
4. Internal rotators	Grade 2
5. External rotators	Grade 3

**Table 2. Range of motion: left side**

1. Shoulder flexion	40°
2. Shoulder extension	35°
3. Shoulder abduction	40°
4. Internal rotation	30°
5. External rotation	30°



**Pre Treatment**



**Post Treatment**



**Pre Treatment**

**Post Treatment**

**Fig. 1. Pre and post treatment**

Assisted exercises assist in rhythmic motion in which muscle contraction and assistance interact against the resistance of restricting structure at the edge of free range is also effective in raising the range [15] In order to indicate to patients that they are permitted to use the arm, the implementation of physiotherapy within the first postoperative week is essential. Instant postoperative sequela, however, hinders full-range workouts and side effects of radiation therapy and axillary strings limit recovery during the first postoperative months [16] In our experience, during the first postoperative month, the axillary strings form and are clinically present as rigid strings extending from the chest wall through the axilla to the elbow or even to the wrist. The strings are very sore in the first few weeks, so full-range motions are uncomfortable for patients during this time. Although the pain fades, the strings usually linger within several months and are unable to completely abduct and flex the shoulder while current. And after the debilitating side effects of radiotherapy and aseptic lymphangitis leave, many people are afraid to resolve the tightening of the cords and the strong binding of scar tissue. They

understand the movement limits and attempt to compensate by using the other arm or adjusting job procedures. Applying extra physiotherapy to patients after or immediately after radiotherapy facilitates full-scale use of the shoulder [17-19] Scar tissue and tendon expansion lowers the strong connection of the skin to the underlying tissue and decreases muscle shortening. The strength of the shoulder is also increased [16-20] Few of the related studies were reviewed ([21-26]

#### **4. CONCLUSION**

In patients surgically treated with breast cancer, team-instructed physiotherapy increases shoulder function. The result of treatment is affected by the type of surgery done and by the use of radiation therapy in patients treated with mastectomy.

#### **CONSENT**

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.



## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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