

**EFFECT OF PNEUMATIC COMPRESSION THERAPY AND QUALITY OF LIFE IN METASTATIC BREAST CANCER PATIENT – A CASE STUDY**Naveenkumar S.¹, Indhu Sravan², K. Keerthana³, Shivaranjani B.⁴, Thirulogachandar G.^{5*}¹Department of Physiotherapy, Sringeri Sharada Equitas Hospital (Cancer cum Multispecialty), Chennai.²Department of Physiotherapy, Panimalar Medical College Hospital & Research Scholar, Garden City University, Bangalore.^{3,4,5}Faculty of Physiotherapy, Ph. D Scholar, Dr. M.G.R. Educational and Research Institute, Chennai.

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**INTRODUCTION**

Breast cancer-related lymphedema (BCRL) is the most feared complication in patients undergoing treatment for breast cancer. It is a chronic debilitating condition and sometimes requires lifelong management. The main issues are significant swelling of limbs which disfigures the patient's body image and may lead to functional disability.^[1]

Every breast cancer survivor is at a risk of developing arm lymphedema (LE). BCRL is a poorly understood disease and there is a lack of consensus for standardized treatment protocols. It is a challenge for the patient, family, as well as the multidisciplinary team treating them.

Lymphedema is a progressive disease caused by insufficient lymphatic drainage leading to abnormal accumulation of interstitial fluid within soft tissues. The most common cause for secondary lymphedema in the developed world is treatment for breast cancer. In the past, almost a forgotten disease, frequently overlooked, nowadays we can provide patients with treatment and relief.^[2]

Rehabilitation interventions have efficacy in early identification and treatment of many of the side effects of cancer treatment in all stages.

The objective of this case report was to demonstrate the benefits of Pneumatic compression therapy (PCT) along with compression garments in reducing limb volume and consequently improving the symptoms of a patient with malignant lymphedema after recurrent breast cancer.^[3]

CASE REPORT

A 62-Year-Old female was diagnosed with carcinoma left breast in the year 2022 (HPE-IDC 3). Her PET CT report showed that there is a left breast mass, axillary, internal mammary and left Para aortic nodes, nodules in

right breast, moderate left pleural effusion, skeletal metastases. She underwent 5 Cycles of Chemotherapy. She had swelling in the left arm for which she was referred to physiotherapy.

Assessment

According to the American society of Lymphology, lymphedema assessment was made, which included circumferential measurement of the arm with inch tape method. Using a tape measure, measure the circumferences (in centimetres) at each point (A, B, C, D, E, and F) on both arms. Circumferential Measurements with inch tape has been recorded and documented for both the upper limbs. The volume of each arm is estimated using the formula for the volume of the frustum of a cone: $V = h * (C^2 + Cc + c^2) / (12 * \pi)$, where V is the volume of a segment of the upper extremity, C and c are the circumferences (in cm) at determined segments of the arm, and h is the distance between circumferences (C, c) in each segment (h = 7 cm was used). The arm circumference is measured at multiple segments. Each adjacent pair of measurements is used to estimate the volume of that segment. The volume estimates of all segments of each arm is summed

to compute the estimated arm volume Assessment was taken during Pre therapy 1st day and post therapy completion at 10th day of the treatment. Pain was assessed with Visual analogue pain rating scale (VAS). The FACT-G (version 4) questionnaire was used to assess the quality of life before and after the treatment.

treatment there was a 3036.6 ml volume difference left arm which is lymphedema affected side noted as per the limb volume formula. On the 10th day it was 2682.8ml volume difference noted left arm which is lymphedema affected side in which Lymphedema therapy was administered.

Intervention and outcome measures

Compression stockings were given and advised to wear regularly at least 10 hours a day during day time and **Pneumatic compression therapy (Lympha press optimal plus)** unit was used to deliver treatment for 10 days. Patient was advised to come for Lymphedema therapy management to Department of Physiotherapy, Sringeri Sharada Equitas Cancer & Multispecialty Hospital, Chennai, Tamil Nadu. At the beginning of the

During Pre-treatment the pain was 7/10 measured with visual analogue scale and after the post-treatment the pain was 1/10 FACT-G (version 4) questionnaire is a validated and reliable tool in assessing quality of life in breast cancer patients. Before treatment the score was 65 which suggested poor Quality of life and after treatment the score was 97 which improved the patient's Quality of life overall. Even reduction in the pain level was noted after the therapy end phase i.e. at the end of 10th day.

Fig.4, Limb Volume Measurements.

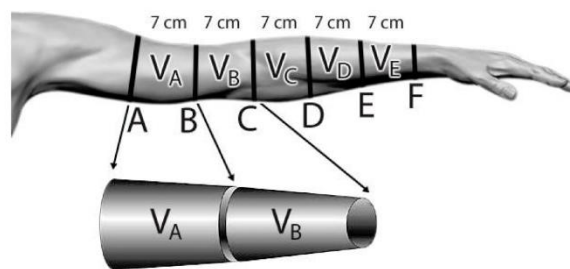
Evaluation Date	Treatment Pneumatic Compression Therapy (PCT)	LUL Volume (ml) (Affected Arm)	RUL Volume (ml) (Normal Arm)	Absolute Difference (AD)
Pre (2.05.2024)	PCT	3036.6	1809.5	1227.1
Post (11.05.2024)	PCT	2682.8	1809.5	873.3

Fig.5: Pain VAS (Visual Analogue Scale).

Pre - Treatment	Post - Treatment
7/10	1/10

Fig.6: Quality of Life.

S.no	Quality of Life	Pre - Treatment	Post - Treatment
1.	Physical Well-being (PSW)	10	27
2.	Social / Family well-being (SWB)	24	24
3.	Emotional well-being (EWB)	15	21
4.	Functional well-being (FWB)	16	25
	TOTAL	65	97



$$V_{Limb} = V_A + V_B + V_C + V_D + V_E$$

Fig. 1: Limb volume measurement & Formula.



Fig. 2: Pre – Lymphedema Therapy Treatment (Baseline- 1st Day.



Fig. 3: Post – Lymphedema Therapy Treatment Completion (10th Day).

DISCUSSION

Patient education on lymphedema during treatment and after treatment plays an important role in successful management of lymphedema throughout and improving quality of life of the patient. Our study concluded that Pneumatic compression therapy with structured exercise therapy is effective in managing lymphedema and improves Quality of life even in Metastatic breast cancer related lymphedema patients. This study will aim to be continued with larger sample size in the future.

CONCLUSION

Timely management of Lymphedema improves physical function of the arm and reduces pain and improves Quality of life even in metastatic breast cancer patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Conflicts of interest

There are no conflicts of interest.

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