



Case Report

Effect of Complete Decongestive Therapy on Lymphoedema, Sleep Quality and Quality of Life in Metastatic Breast Cancer Patient – A Case Study

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ABSTRACT

Lymphoedema is the accumulation of fluids with the high-protein content in the intercellular space, which is the most common complication seen in patients with breast cancer. In this study, we discuss the case of a 67-year-old female operated case of the left modified radical mastectomy in 2012. After 9 years, she had recurrence on the right side and diagnosed with metastatic breast cancer Stage 3 B. She developed lymphoedema on the same side for which she was referred to physiotherapy for further management. Along with radiation treatment, physiotherapy intervention such as complete decongestive therapy (CDT) for lymphoedema was initiated for 10 days which included multilayer lymphoedema bandaging, manual lymphatic drainage and exercise therapy. At the beginning, volume difference was 1688 ml then on the 5th day, it was 1133 ml, and on the 10th day, it was 802 ml noted. There was significant reduction in the volume of the involved limb that led to improvement in the score of sleep quality and quality of life (QOL). The major aims of CDT are to improve lymph circulation and to prevent lymphatic stasis which improves the QOL and sleep quality. Patient education and counselling along with home programme of bandaging played a major role in the recovery of the patient. CDT plays an important role in reducing lymphoedema and improving the sleep quality and QOL in metastatic breast cancer patient.

Keywords: Complete decongestive therapy, Lymphoedema, Quality of life, Sleep quality, Metastatic breast cancer patient

INTRODUCTION

According to 2020 GLOBOCAN, approximately 2.2 million cases worldwide were diagnosed with breast cancer and 178,361 cases found in India and about 90,408 died from disease. The most common complication of breast cancer treatment is lymphoedema. It is an accumulation of high-protein-rich fluids in the intercellular space. Most of the time, due to this complication, the patient experiences long-term physical and mental distress which leads to poor quality of life (QOL).^[1] Physiotherapy rehabilitation is a multidisciplinary approach to reduce lymphoedema. Complete decongestive therapy (CDT) helps to improve lymphatic drainage and prevents lymphatic stasis.^[2]

QOL is a 'composite measure of physical and social well-being as perceived by each individual or by group of individual.'^[3] Breast cancer patients have poor QOL. 'European Organization for the Research and Treatment of

Cancer Quality of Life Questionnaire (EORTC-QOL C-30)' is valid and reliable in breast cancer patients.^[4]

One of the most common and profoundly influencing symptoms in cancer patients is sleep disturbance. When a person for at least 1 month cannot initiate or maintain sleep, then it is defined as insomnia.^[5] Insomnia may persist before and after the diagnosis of cancer, which affects various dimensions of QOL.^[1] Insomnia in cancer patients is higher than the general population, as per Pittsburgh Sleep Quality Index (PSQI) measures.^[5] Tamam *et al.* stated that there is correlation between QOL and quality of sleep in breast cancer-related lymphoedema patients. Both significantly decreased in breast cancer patient.^[6]

CASE REPORT

A 62-year-old female patient operated case of the left modified radical mastectomy with axillary clearance and had taken 8 cycles of chemotherapy and 15 cycles of radiation therapy in year 2012. After 9 years, she had recurrence on the

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right side and diagnosed with metastatic breast cancer Stage 3 B as per the biopsy report, for which she was referred to radiation oncologist. She had swelling in the right arm for which she was referred to physiotherapy.

Assessment

According to the American Society of Lymphology, lymphoedema evaluation was done, which included circumferential measurement of the arms. For the measurements, the patient was placed with her arm supported on the table. Reference points were selected at 4 cm intervals from starting point (ulnar aspect of the arm) to 2 cm below the axilla marked all the reference points of both the limbs.^[7]

With the limb in relaxed position, the circumference was measured with tape at each mark, documented the measurements and repeats the same process for other limb. The Kuhnke V_{limb} formula, $V_{limb} = \Sigma\pi (X^2 + Y^2 + XY) h/3$, was used to calculate limb volume.^[2] Assessment was performed before start of the therapy, after the 5th day and 10th day of the treatment.

The EORTC QOL C-30 questionnaire was used to assess the QOL and sleep quality was assessed by PSQI before and after the treatment.

Intervention and outcome measures

CDT was done regularly for the first 10 days. At the beginning of the treatment, there was a 1688 ml volume difference noted as per the limb volume formula. On the 5th day, it was 1133 ml, and on the 10th day, it was 802 ml volume difference noted.

EORTC-QOL C-30 questionnaire is valid and reliable in breast cancer patients. There are total 30 questions in questionnaire used to assess physical health, emotional, cognitive and social functioning.^[4] Before the treatment, the score was more than 50 which suggested poor QOL, and after the treatment, the score was less than 50 which suggested good QOL.

PSQI questionnaire consisted of seven domains which include a total range of score from 0 to 21 with a possible score from 0 to 3 each. According to the PSQI questionnaire, total score of <5 and equal to 5 indicates a good quality of sleep and a score >5 indicates a poor quality of sleep.^[1] Before the treatment, the PSQI score was high (more than 5) which indicates poor sleep quality, and after the treatment, it was less than 5 which suggested good sleep quality [Table 1].

After 10 days of session, the patient was followed up for further 3 months. Reassessments were done again 1 month and 3 months. After 1 month, volume difference was 712 ml and 3 months was 276 ml noted [Table 1 and Figure 1].

DISCUSSION

The patient attended the physiotherapy outpatient department of government tertiary health-care hospital

daily. According to the International Society of Lymphology, CDT is the best treatment for lymphoedema and it improves patient's mobility and QOL.^[2]

It comprises two phases.

Phase 1 (intensive phase): It consists of initiation of decrease in the proliferation of connective tissue by mobilisation of fluids.

Phase 2 (maintenance phase): It aims for optimisation of connective tissue and swelling reduction.^[7]

Various physiotherapy treatment techniques are given for breast cancer-related lymphoedema [Table 2].

Multilayer lymphoedema bandaging is an intensive therapy which includes inelastic bandages that have low extensibility and high working pressure and lower resting pressure which creates peak pressures to produce a massaging effect and good lymphatic flow [Figure 2].^[8]

Emphasising patient education, psychological counselling and improving social interaction through treatment may help



Figure 1: Improvement in volume difference.



Figure 2: Multilayer lymphoedema bandaging.

Table 1: Improvement in outcome measures.

Outcome measures	Day 1	Day 5 th	Day 10 th	After 1 month	After 3 months
PSQI score	16 (poor)		4 (good)	4 (good)	4 (good)
EORTC QOL C-30 score	62 (poor)		45 (good)	35 (good)	35 (good)
Lymphoedema volume difference	1688 ml	1113 ml	806 ml	712 ml	276 ml

PSQI: Pittsburgh Sleep Quality Index, EORTC QOL C-30: European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire C-30

Table 2: Physiotherapy management for breast cancer-related lymphoedema.^[7]

Treatment	Description	Frequency
1. Patient and caretaker's education and counselling	Patient education consisted of: <ul style="list-style-type: none"> • Explaining the importance of active participation in the therapy, exercises and limb hygiene • Explain dos and don'ts to patient and caretaker. (e.g., avoid wearing tight clothing and jewellery) • Avoid gravity-dependent position (e.g., hanging of limb) • Importance of wearing compression garment in daytime and bandaging at night time • Step-by-step bandaging taught to the caretaker, so they can do at home in the absence of therapist. Furthermore, bandaging video provided to the caretaker. (bandaging online video link: https://drive.google.com/file/d/1RkHOOE0vclcbEAYclMk5JLCxvSgjvrC4/view?usp=drivesdk) • The patient was instructed to follow this regime for maintenance and to avoid recurrence of symptoms 	Once per week and as required in between
2. Skin care	<ul style="list-style-type: none"> • Wash daily with soap • Ensure if skin folds are present then clean and dry • Look for any skin cuts, insect bites, wounds etc. • Apply emollients 	Once per day
3. Pain relief	<ul style="list-style-type: none"> • Light strokes of effleurage • Active-assisted ROM exercise 	Thrice per day
4. Manual lymphatic drainage	<ul style="list-style-type: none"> • According to Leduc, it includes light semi-circular hand movements on the skin to empty the lymphatic congestion towards the proximal parts of the limb and along the lining of the lymph from the distal parts 	Once per day/40 min
5. Bandaging	<ul style="list-style-type: none"> • Multilayered short stretch bandaging to be worn day and night • The detailed procedure of bandaging was taught to the patient's relative/caretaker 	24 h
6. Exercises	<ul style="list-style-type: none"> • Deep breathing exercises • Active range of motion exercises for shoulder • Hand pumping exercise with hand elevation. 	3 times/day 1 set 10 repetitions with 10 seconds holds

to avoid physical, mental and social disability.^[2] Our study concluded that CDT is effective in lymphoedema management which overall improves the sleep quality and QOL.

Patient's perspective

I had severe swelling in my right arm due to which my arm was so heavy that made me sleepless at nights. I was so embarrassed to mingle out with others. I started physiotherapy and since then, my swelling has reduced and there is no sleep disturbance. Now, I am able to maintain the swelling with compression garment and bandaging.

CONCLUSION

CDT and home programme help in regaining the lost functions of breast cancer-related lymphoedema survivors. It makes them

independent in their daily activities, minimises the caregivers assistance and thereby improving sleep quality and QOL in metastatic breast cancer patients. Timely management of lymphoedema improves sleep quality and QOL.

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Declaration of patient consent

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

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Conflicts of interest

There are no conflicts of interest.

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