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Case series

PRELIMINARY EVALUATION OF COMPLEX DECONGESTIVE THERAPY IN THE TREATMENT OF UPPER LIMB LYMPHEDEMA AFTER BREAST CANCER

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ABSTRACT

Background: *Secondary upper limb lymphedema is a common complication after breast cancer treatment. Among the treatment methods, conservative treatment with complex decongestive therapy brings positive results to patients and it is non - invasive.*

Methods: *Cross - sectional description of 7 cases diagnosed with lymphedema after breast cancer and treated with complex decongestive therapy. Assessment was based on limb circumference with 4 different measuring positions and Quick - Disabilities of the Arm, Shoulder and Hand (Q-DASH).*

Results: *The mean age was 58.4 (42 - 73), there was 1 patient in stage I, 5 patients were in stage II and 1 patient was in stage III. After 1 month of treatment, all patient's hand circumferences were decreased, of which 1 patient was returned to normal hand circumference. All 7 patients were decreased Q-DASH scores.*

Conclusion: *This technique can be widely applied to other patients with upper limb lymphedema after breast cancer. This study needs to be performed with a larger sample size to confirm effectiveness.*

Keywords: *Lymphedema, breast cancer, complex decongestive therapy, limb circumference, Q-DASH.*

I. INTRODUCTION

Lymphedema is a chronic disease caused by dysfunction of the lymphatic system, resulting from the accumulation of interstitial fluid containing high molecular weight proteins. Lymphedema is mostly the result of other causes (after cancer surgery, radiation therapy, infection, filariasis, etc.), only 5% is congenital (primary lymphedema) [1, 2].

Secondary lymphedema of the upper limb is one of the common complications in breast cancer treatment with the rate of 16.6% [3]. The number of axillary lymph nodes that are dredged after surgery, chemotherapy, and radiation therapy are the main factors promoting the occurrence of lymphedema, and nearly 90% of lymphedema occurs in the first 2 years after radiation therapy [4].

In addition to hand edema, other symptoms that can be seen in patients with upper limb lymphedema which are limited movement, weak hand strength, hand pain, tingling sensation, and numbness. They lead to upper limb function impairment and reduce the patient's quality of life [3].

There are currently two methods of treating lymphedema: surgery and conservation. Among them, conservative treatment is recognized by the International Society of Lymphology (ISL) as an effective non - invasive technique for patients. Specifically, complex decongestive therapy (CDT) includes the following steps: manual lymphatic drainage, compression bandage, skin care, physical exercise and hand elevation [5].

Treatment of upper limb lymphedema with CDT is performed in many countries around the world, but in Vietnam it is still not popular and not performed accurately. Therefore, we conducted this study to evaluate the initial effectiveness of applying the CDT method at our hospital.

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II. PATIENTS AND METHODS

2.1. Research subjects

Sample selection criteria: Patients were diagnosed with lymphedema of the upper limb after breast cancer treatment and came to the Department of Rehabilitation - Hue Central Hospital from March 2023 to July 2023.

Exclusion criteria: (1) Patients in mild stage 0, I [1] who were instructed on how to self - manual lymphatic drainage on the arm edema with limb elevation. As a result, the hands were decreased edema and returned to normal, were not included in the study. (2) The patients had an acute infection, heart failure, arterial occlusive disease.

All 7 patients were included in the study.

2.2. Research methods

Treatment protocol: The patients were treated by CDT method. Full combination of the following methods:

1: Manual lymphatic drainage (MLD) [5, 6]

Includes the following main steps: Step 1: Abdominal breathing. Step 2: Stimulating lymph nodes in the neck, axilla, groin, abdomen. Step 3: Activating to open borders. Step 4: Draining the lymph in the right direction to where the lymph nodes is not affected.

2: Compression bandage [5]

Wrap edema hand with a multi - layer bandage, the pressure was higher at the periphery, gradually decreasing to the center of the body, use a short stretch bandage. Wear the compression bandage all day and night, even when exercising. Remove the bandage when bathing, skin care, and manual drainage.

Figure 1: Compression bandage with short stretch bandage

3: Skin care

Always applied moisturizing lotion, moisturizing shower gel, and sunscreen when went out in the sun. In addition, you must also be careful in daily activities, avoided hurting your hands with edema.

4: Exercise and elevation your limbs

The patient was trained in mild to moderate intensity exercises. When practicing wore compression bandages or socks to increase efficiency. The patient was monitored and treated for 5 days at the hospital, then the patient and family members were instructed to continue performing the techniques at home. Re - examination after 1 month.

2.3. Evaluation criteria

Evaluation of the results was based on the change in arm circumference and the Q-DASH (Quick - Disabilities of the Arm, Shoulder and Hand) scale that assesses the function of the arm, shoulder and hand.

Measure the circumference with 4 landmarks.

- Arm: measure 10 cm up from the elbow crease, mark and measure the circumference through that point.
- Forearm: measure 10 cm down from the elbow crease
- Wrist: just below the processus styloideus ulnae.
- Hand: measure around 4 fingers (II, III, IV, V) from the base of the thumb

Limbs were measured at the time of examination and at re - examination after 1 month.

Measured in the morning, the patient is in a sitting position with his back straight and his hands placed on the examination table.

Q-DASH scale [7]

Is a self - assessment questionnaire consisting of 11 items, in which the answer options are presented in the form of a 5 - point Likert scale with

1 being "not difficult" and 5 being "impossible". Questions asked about difficulty in performing physical activities involving the upper limbs, pain, numbness, impact on social activities, work, and sleep. Total score ranges from 0 (no disability) to 100 (worst disability). The higher the score, the greater the likelihood of disability.

Rate this scale at the time of re-examination after 1 month.

III. RESULTS

During the period from March 2023 to July 2023, 7 patients with upper limb lymphedema after breast cancer were treated by CDT method. The median age was 58.4 (42 - 73), all females. The left/right breast cancer ratio was 6/1. There were 2 cases of breast cancer surgery combined with chemotherapy and 5 cases of breast cancer surgery combined with both radiotherapy and chemotherapy. Duration of breast cancer surgery: 1 patient under 1 year, 6 patients over 5 years. The time of upper limb lymphedema (up to the time of visit to the clinic) of all patients was less than 4 months, only 1 patient was 1.5 years. Stage of lymphedema: 1 stage I, 5 stage II and 1 stage III.

Triggering factors: 1 case of upper limb lymphedema after chemotherapy, 1 case after flying and vigorous upper limb massage, 1 case after heavy work, 4 cases of unknown triggering factors.

In addition to the symptoms of edema and thicker skin, 2 patients had upper limb edema pain, 1 patient had numbness, 2 patients had both upper limb lymphedema pain and numbness, no patient had signs of infection such as heat or red skin.

Table 1: Comparison of upper limb lymphedema circumference after treatment period

Numerical order	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Stage	**II**	**I**	**II**	**II**	**II**	**III**	**II**
ARM							
A	35	27	23	28	27.5	33.5	32
B1	41	28	34.5	31	30	39	34
B2	39	27	30	27.5	29	39	32
Decrease	2	1	4.5	3.5	1	0	2
FOREARM							
A	25	19.5	20	23	23.5	24.5	24
B1	35.5	21	27	25	26	35	29
B2	28	19.5	24	22.5	23.5	29	27
Decease	7.5	1.5	3	2.5	2.5	6	2
WIRST							
A	18	14.5	15.5	16.5	17	18.5	16
B1	23	18	19	18	18	23	20
B2	19	15	17	16.5	17	21	17
Decrease	4	3	2	1.5	1	2	3
HAND							
A	19.5	18	19	20	19.5	20.5	20
B1	21	22	20	22	21	22	24
B2	19.5	18	19	19.5	19.5	21	22
Decrease	1.5	4	1	2.5	1.5	1	2

A Measure the circumference of the non - edema limb at the time of examination (cm). B1 Measure the circumference of the upper limb lymphedema at the time of examination (cm). B2 Measure the circumference of the upper limb lymphedema at the re - examination after 1 month (cm).

At the time of examination, the upper limb lymphedema was larger in size than the corresponding healthy upper limb when measured in different positions. After 1 month of re - examination, upper limb edema circumference was decreased. The maximum reduction is 7.5 cm. There was 1 patient in stage I after 1 month of treatment, the upper limb edema circumference was returned to normal. In other patients in stages II - III, the upper limb edema circumference was decreased but was not returned to the normal level (except for 1 patient who lost weight, so the edema was decreased even more than the initial measurement of a normal upper limb).

Figure 2: A patient with stage II lymphedema after breast cancer at examination (A); After 1 month of re-examination (B).

Table 2: Comparison of Q-DASH score at the time of initial examination and the time of re - examination after 1 month.

Numerical order	1	2	3	4	5	6	7
Q-DASH initial examination	73	64	93	43	61	64	66
Q-DASH after 1 month re-examination	34	20	55	11	30	57	20

All 7 patients reduced their Q-DASH scores, 5 patients reduced their scores by more than 50%. All patients had improvements in upper limb function, reduced pain and numbness, improved sleep, work and activities daily.

IV. DISCUSSION

Breast cancer is one of the most common cancers in women. According to Globocan statistics in 2020, the global incidence of breast cancer in women was 24.5%, the highest among all types of cancer in women [8]. Methods to treat breast cancer can include mastectomy with axillary lymph node dissection, radiation therapy, chemotherapy, etc... which can all damage the lymph nodes and vessels, cause stagnation and fluid accumulation and lead to lymphedema in the upper limbs. Surgery or conservation are the two main methods of treating lymphedema. Surgical methods such as lymphatic-venous anastomosis [2], vascularized lymph node transplantation, liposuction [1] ... however, these are highly technical and difficult to perform, requiring

modern equipment. In contrast, conservative treatment with complex decongestive therapy is increasingly popular because it is noninvasive and easy to perform.

According to research by E. Michopoulos and colleagues, lymphedema time was one of the factors predicting the effectiveness of CDT treatment in patients with lymphedema [9]. 105 patients with lymphedema of an upper or lower limb were divided into 2 groups with edema for less than 1 year (A) and 1 group with edema for more than 1 year (B). Both groups received CDT intervention for 4 weeks. The effectiveness of CDT was determined by the percent reduction of excess volume (PREV) in the limb lymphedema compared to the healthy limb. Edema results decreased significantly in both groups but decreased more in group A ($p < 0.001$). Thus, duration of lymphedema was found to be a strong predictive factor that may significantly impact CDT efficacy. Therapeutic effects were increased in subjects who were detected and treated earlier for lymphedema. In our study, there was 1 patient in stage I who, after 1 month of re - examination, the circumference measurement returned to normal. The other patients in stages II and III had limb size measured after 1 month were decreased but has not returned to normal. One patient had lymphedema for 1.5 years and when she was re - examined, the arm circumference had not decreased, forearm and hand were decreased.

In the study by C.Basoglu et al., the purpose was comparing the effectiveness of CDT with Kinesiology taping (KT) on patients with upper limb lymphedema after breast cancer: a randomized controlled clinical trial [3]. Forty patients with stage 2 lymphedema after breast cancer were divided into 2 groups, 20 patients used CDT therapy, 20 patients used KT therapy. Re - evaluate after 1 month of treatment and 1 month of follow-up. Outcomes were based on limb circumference and volume, grip strength, upper limb function, and quality of life (with the Q-DASH and FACT-B Functional Assessment of Cancer Therapy-Breast). The study found that both KT and CDT significantly reduced edema limb circumference and volume, however KT was less effective than CDT in terms of reducing edema limb circumference, volume, grip strength, and quality of life. The results showed that KT with skin care and exercise was not a substitute for MDL and compression bandaging in the intensive phage of classic CDT.

The limitation of the study was the small number of samples. The patients in the study were treated and closely monitored for the first 5 days, then instructed to go home for treatment. However, when they came back home, the compression bandage and drainage may not be done correctly by the patient and their family.

V. CONCLUSION

Through 7 clinical cases, we found that complex decongestive therapy for the treatment of patients with upper limb lymphedema after breast cancer was a safe, non - invasive method that helped to reduce lymphedema of the arm circumference and improved function of upper limbs. This technique can be widely applied to other patients with upper limb lymphedema after breast cancer. This study needs to be performed with a larger sample size to confirm effectiveness.

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