



Physical treatment of secondary lymphedema of the arm in breast cancer patients

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Secondary lymphedema of the arm (SLEA) is the most common consequence of operation and/or radiotherapy for the malignant tumors of the breast. The frequency of SLEA is from 6 to 30 percent in patients with breast cancer. This paper presents literature data about the methods of physical treatment of SLEA. A complex of decongestive physical therapy (CDP) is described, consisting of the skin care of the arm on the operated and/or irradiated side, kinesy therapy, manual lymphodrainage of arm, and bandaging with multi-layer non elastic bandages of the arm. Along with CDP, a device-assisted sequential pneumatic compression can be applied in order to reduce the SLEA. The prevention and early detection of SLEA, while it is still reversible, is the most important task in the postoperative and postirradiation period after the treatment of breast cancer.

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*"A non invasive method produces continued reduction"
Casley-Smith J.*

INTRODUCTION

Secondary lymphedema of the arm (SLEA) arises due to overloading of the lymphatic vessels, i.e. disproportion between volume of the lymph and transportation capacity of the lymphatics (1).

Different data from the literature appear on the frequency of SLEA due to non-standardized criteria for diagnostic assessment of SLEA, different times of appearance (from few months to several years), and neglectfulness of the problem of SLEA as compared to the primary disease. In a study summarizing data on 35 papers from different parts of the world, the frequency of SLEA ranged from 6% to 30% of treated breast cancer patients (1,2).

The most often etiological factors for development of SLEA are surgical treatment and dissection of axillary lymph nodes. If the patient is submitted to radiotherapy, the risk of SLEA rises significantly. In some papers a statistically significant appearance of

SLEA is reported in women younger than 45 years (risk 6 times higher in comparison to women aged over 65 years), as well as in women suffering from obesity, hypertension and women who often fly by plane (1,3,4,5,6,7).

SLEA does not represent only an esthetic problem. It is often followed by a feeling of a weight in the arm, pain, numb sensation and functional disorder ("separation" of the shoulder, contracture of the shoulder, paresis and/or paralysis of the brachial plexus) (1,6).

SLEA-quantification is not uniform. The simplest and most used method is the measurement of the circumference of both arms. The measurement is done on at least five symmetrical levels: across the middle of metacarpal joint, across the radiocarpal joint, 15 cm below the olecranon, across the olecranon, and 15 cm above the olecranon. Determination of the difference of circumference of 2 cm at one location at least gives the diagnosis of SLEA. Volumetric method of measurement, which measures the volume of primed liquid of the submerged arm (minimal fluid quantity should be 200 ml), and more sophisticated methods like PET, MRI and CT are rarely used.

PHYSICAL TREATMENT OF SLEA

In 1892, Winiwater introduced physical methods in the treatment of SLEA. In thirties, Vodder inaugurated new techniques of manual lymphodrainage. Later, another schools for non-invasive treatment of SLEA were formed (Foldi, Leduc, Casley-Smith) (8-11).

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At the end of seventies of 19th century, a device-assisted management of SLEA by means of sequential pneumatic compression was introduced, first as one-channel device, which was later made into a multi-channel device.

Complex of Decongestive Physical therapy (CDP)

CDP is the most common method used for non-invasive drugless treatment of SLEA and it includes:

- Treatment of the skin on the operated and/or irradiated arm;
- Kinesy therapy (KTH);
- Manual lymphodrainage of the arm (MLD);
- Bandaging of the arm;

The treatment of the skin comprises of the application of mild, neutral soaps, avoidance of the skin exposure to extreme heath, compression, trauma and physical overloading of the arm.

KTH represents a set of exercises intended to maintain or augment (if the contracture of shoulder is present) the extent of movements in the shoulder and to reduce the SLEA. It is conducted by means of exercises with an elevated arm and exercises that activate the muscle pump. KTH is must be performed with bandaged arm.

The MLD technique augments the circulation of the lymph, improves collateral drainage in neighboring lymphatics, and "brakes off" the fibrous tissue. MLD is performed by moderate pressure and somewhat stronger pressure in the region of fibrous tissue. In the phase of intensive treatment, this procedure is recommended in duration of 1hour twice a day, in total span of 2 to 4 weeks. After the reduction lymphedema (during the maintenance treatment) the frequency and the duration of the therapy is also reduced.

After the MLD treatment the application of bandage to the arm is compulsory.

By bandaging the arm in SLEA one achieves the reduction of lymph filtration into the interstitial tissue by augmenting the tissue pressure, improves the efficacy of the muscle pump, prevents the recirculation of the lymph and softens the fibrous tissue by placing an inset on the place of fibrosis. A multi-layer bandage with cotton layer and an outer non-elastic layer are recommended. An elastic sleeve is placed after the reduction of edema.

Sequential External Pneumatic Compression (SEPC)

This method (SEPC) can be used in addition to CDP. The device has 12 channels that provide a wave of ascendant pressure with a gradient of sequential pressure reaching 10 mm Hg between each channel with a pressure being higher in the distal region. Application of SEPC improves the resorption of the lymph, but not the interstitial proteins; hence re-accumulation of the lymph appears quickly.

The opinions on the efficacy of this treatment are discordant, as well as parameters, which are applied by using this device (pressure, duration of single treatment and the span of one cycle).

CONCLUSION

SLEA is often an irreversible consequence after the treatment of breast cancer. Mostly, physical treatment leads to SLEA reduction, and infrequently to complete elimination of SLEA. Prevention and early detection of SLEA is a priority task in postoperative and postirradiation period of breast cancer.

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