

Extra Corporeal Shock Wave therapy as additional treatment for lymphedema after breast cancer and lymphatic surgery.

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1. Introduction

A complication of breast cancer (BC) patients treated with axillary surgery is upper limb lymphedema. If longstanding, fibrosis and fat hypertrophy develops and is clinically seen as a non-pitting edema.

2. Material & Method

Ten patients, 9 females and 1 male, presenting with a unilateral advanced fibro-lymphedema (stage III) after BC therapy were selected. All patients were treated initially by breast and axillary surgery, additional chemotherapy and radiation therapy. Despite complete physical therapy, derivative and reconstructive lymphatic surgery, the lymphedema persisted.

Patients were treated with an "MTS Dermagold ow 100" electro-hydraulic shock wave device with an OP155 unfocused applicator during 4 weeks, twice weekly. At each session, 1800 shocks were applied to the clinical most fibrotic zone and 800 shocks in a grid pattern around this area. The energy level was set on 0.10 mJ/mm^2 , a frequency of 4 Hz, membrane pressure level 6 or 7. The generated shock wave with these parameters has a penetration depth of around 8 cm and a large focus of around 10 to 15 mm. The total amount of energy applied per session is 5880 mJ. No special preparation or anesthesia is required for this type of therapy.

3. Results

Mean circumference of the upper limb was significantly decreased from $32.3 \pm 3.01 \text{ cm}$ to $31.4 \pm 2.71 \text{ cm}$ at the height of upper arm, from $29.1 \pm 2.89 \text{ cm}$ to $28.1 \pm 2.71 \text{ cm}$ at the height of the elbow and from $27.5 \pm 4.08 \text{ cm}$ to $26.8 \pm 3.75 \text{ cm}$ at the height of the forearm. Upper limb volume decreased non-significantly, from $3086.4 \pm 539.47 \text{ ml}$ to $2909.1 \pm 471.60 \text{ ml}$. Subjective measurements by Visual Analogue Scale (VAS) showed significant decrease in both hardness from $57.3 \pm 15.84 \text{ mm}$ to $44.4 \pm 21.89 \text{ mm}$ and subjective feeling of edema from $44.2 \pm 16.90 \text{ mm}$ to $23.2 \pm 21.16 \text{ mm}$. No adverse features were reported.

4. Discussion

Extra corporeal shockwave seems to be a well-supported and harmless treatment, also in advanced LE. Administered to the fibrotic areas softening of the skin and hypodermis and further reduction of the edema brings more comfort to the patients. Direct mechanical effect on fibrotic areas and tissue regeneration by stimulating (lymph) angiogenesis are thought to be responsible for this clinical result.