

CLINICAL HIGHLIGHTS

Flexitouch® Therapy Proven to Stimulate the Lymphatic System in Breast Cancer-Related Lymphedema Patients

Original Article:	Direct Evidence of Lymphatic Function Improvement After Advanced Pneumatic Compression Device Treatment of Lymphedema
Journal:	<i>Biomedical Optics Express</i> . Vol. 1(1): 114–125.
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OBJECTIVE

The objective of this pilot study was to use the technique of near-infrared (NIR) fluorescence imaging to evaluate response of the lymphatic function during and after advanced pneumatic compression device (APCD) therapy using the Flexitouch System in normal control subjects and in subjects with breast cancer-related lymphedema (BCRL).

METHODS

- Nine subjects were enrolled in this study; three with healthy limbs (control), six with unilateral breast cancer-related lymphedema (BCRL)
- Subjects received NIR-fluorescent contrast injections of Indocyanine Green (ICG) intradermally, and were imaged for approximately 2.5 hours
- Subjects' arms were imaged with the following criteria:
 - Both arms of all subjects were imaged for one hour prior to Flexitouch treatment to establish a baseline
 - Contralateral, untreated arms were imaged for one hour during Flexitouch treatment
 - Both arms of all subjects were imaged for 30 minutes post-treatment
- Positive velocities of lymphatic transport designated proximal flow, negative values signified distal movement
- Rates of lymphatic propulsion are determined by propelled "packets" over time
- Data of lymph velocity and propulsion rate were calculated and grouped into pre-, during and post-APCD treatment for both treated and contralateral, untreated arms

RESULTS

BCRL subjects

Treated arms

- Improved lymphatic function in 4 of 6* subjects post-treatment, defined as proximal advancement of ICG toward the axilla or shoulder

Untreated arms

- Statistically significant increase in propulsion rates [$P < 0.05$] in all subjects post-treatment compared to pre-treatment
- Statistically significant increase in propulsion rates [$P < 0.05$] in 4 of 6 subjects during the initial truncal preparation and arm drainage phases as compared to pre-treatment

Control subjects

Treated arms

- Statistically significant increase in propulsion rates [$P < 0.05$] post-treatment compared to pre-treatment

Untreated arms

- Increases in:
 - Propulsion rates during the initial preparation and drainage phases
 - Vessel recruitment in 2 of 3 subjects
 - Lymphatic propulsion during and post-treatment

PRE-TREATMENT

POST-TREATMENT

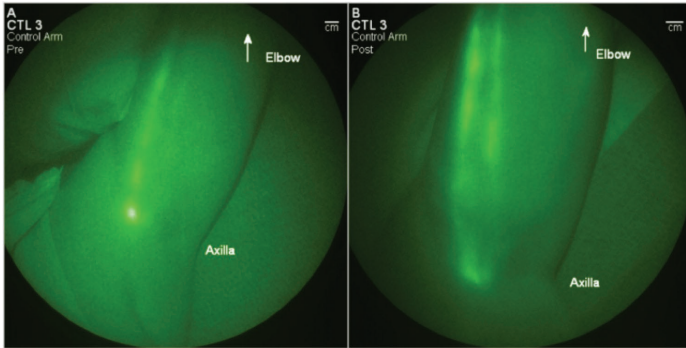
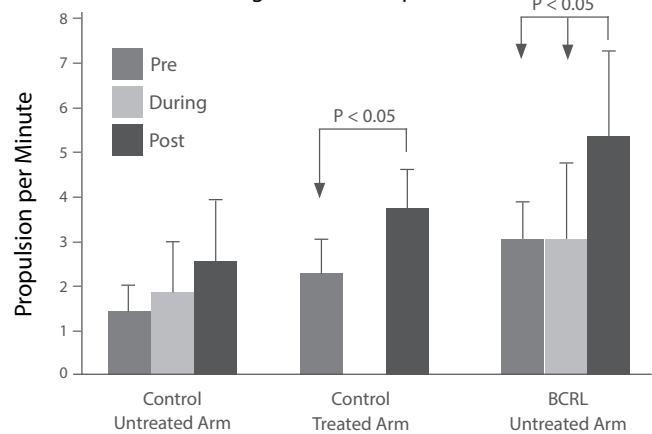


Fig. 1 Rate of Propulsion



DISCUSSION

- This groundbreaking study presents direct evidence that Flexitouch treatment improves lymphatic function systemically both during and after treatment. In addition, the results provide evidence for clinicians that the Flexitouch System is an effective treatment for lymphedema
- Flexitouch treatment improved lymphatic function in both healthy and affected lymphatic systems, as indicated by the statistically significant increases in propulsion rates
- Lymphatic function improvement as demonstrated in both the treated and untreated arms of BCRL patients indicates that Flexitouch treatment stimulates the lymphatic system
- Enhanced lymphatic propulsion in the BCRL subjects began during truncal preparation and continued post-treatment, indicating that Flexitouch treatment may “jump start” lymphatic function in patients with lymphedema

KEY POINTS

- The study provides clinical evidence that the Flexitouch treatment can stimulate the lymphatic system to positively influence treatment outcomes for patients with BCRL
- Lymphatic function improved in all BCRL subjects
 - Proximal movement of ICG in the treated, symptomatic arms
 - Increased frequency of lymph propulsion in the untreated, asymptomatic arms
- Findings suggest that Flexitouch stimulates lymphatic function and may be an effective method to manage breast cancer-related lymphedema (BCRL)

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