Title: LOCAL TISSUE WATER CHANGES ACCOMPANYING A SINGLE MANUAL LYMPHATIC DRAINAGE (MLD) TREATMENT IN PATIENTS WITH LOWER EXTREMITY LYMPHEDEMA

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Background: Previous reports described the utility of measuring local tissue water (LTW) via tissue dielectric constant (TDC) measurements to assess postmastectomy lymphedema presence and extent (Lymphology 2007;40:87-94). Our present goal was to determine this methods suitability for lower extremity assessments and to quantitatively characterize LTW changes associated with therapy. For this purpose we measured changes in LTW produced by one MLD treatment in patients with lower extremity lymphedema.

Methods: LTW was estimated via TDC values measured to a depth of 2.5 mm at the greatest leg swelling site before and after one MLD treatment in 27 legs of 18 lymphedema patients. Girth at the LTW target site was measured with a calibrated tape measure. TDC values, which range from 1 for zero water to 78.5 for all water within the sampled volume, were measured four times and the average used to assess LTW.

Results: In every case the post-treatment LTW was reduced from its pre-treatment value with percentage reductions ranging from -3.0% to -23.5% with an overall change (mean +/- SD) of -9.75 +/- 5.64% (p<0.0001). Changes in girth were smaller, ranging from -5.26% to +0.91% with an overall change of -1.55 +/- 1.93% (p<0.05).

Conclusions: Since TDC measurements reflect changes to a depth of about 2.5 mm whereas girth measurements reflect conditions of the entire cross-section, it is likely that the TDC assessment is more sensitive to smaller changes and to the immediate effects of MLD treatment. The substantial percentage change in LTW, but much smaller change in girth, are consistent with this and suggest that TDC measurements may be useful as complementary and perhaps independent assessment methods of edema/lymphedema and treatment-related changes.