

**Title:****Soft Tissue Composition of Arms Affected by Breast Cancer Related Lymphoedema-Assessment with DEXA****Abstract:**

**Introduction:** Chronic, non-pitting, large volume lymphoedema has been shown to be associated with soft-tissue changes, especially increased adiposity [1]. Our aim was to assess soft tissue composition of arms in women with stage I or early stage II lymphoedema [2] with Dual Energy X-ray Absorptiometry (DEXA) and to compare the results to women without lymphoedema.

**Methods:** Nine women with breast cancer related lymphoedema were assessed. All women had lymphoedema which pitted with pressure. Arm extracellular fluid was determined with Bioimpedance Spectroscopy (BIS) and fat and lean tissue with DEXA. DEXA measurements were made of the whole arm and 10cm arm segments commencing at the ulnar styloid for both affected and unaffected arms. DEXA results were compared to 45 women without lymphoedema of similar age and BMI.

**Results:** Women with lymphoedema had a higher absolute fat mass in their affected arm, regardless of dominance (mean difference between arms 196.3g; range 29 to 566.2g). Of the four arm segments the proximal forearm region at 10-20cm was most affected by increased adiposity. In contrast women without lymphoedema had less fat in their dominant arm (mean difference between arms -67.9g; range -325 to 254g).

**Conclusion:** Our findings indicate that increased adiposity may occur in earlier stage lymphoedema than previously thought, with the proximal forearm most affected. This finding is supported by research suggesting that the proximal forearm is affected early in lymphoedema development [3, 4].

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**References:** [1] Brorson H, Ohlin K, Olsson G, Karlsson MK: (2009) Breast-Cancer Related Chronic Arm Lymphedema is Associated with Excess Adipose and Muscle Tissue. *Lymphatic Research and Biology*, 7(1):3-10  
[2] Lymphology ISL: (2009) The diagnosis and treatment of Peripheral Lymphedema-2009 Consensus document of the International Society of Lymphology. *Lymphology*, 42(51-60)  
[3] Stanton AW, Mellor RH, Cook GJ, Svensson WE, Peters AM, Levick JR, Mortimer PS: (2003) Impairment of lymph drainage in subfascial compartment of forearm in breast cancer-related lymphedema. *Lymphatic Research and Biology*, 1(2):121-132.  
[4] Stanton A, Modi S, Mellor R, Levick J, Mortimer P: (2009) Recent Advances in Breast Cancer Related Lymphedema of the Arm: Lymphatic Pump Failure and Predisposing Factors. *Lymphatic Research and Biology*, 7(1):29-45.