

Modification of Manual Lymphatic Drainage Based on ICG Lymphography

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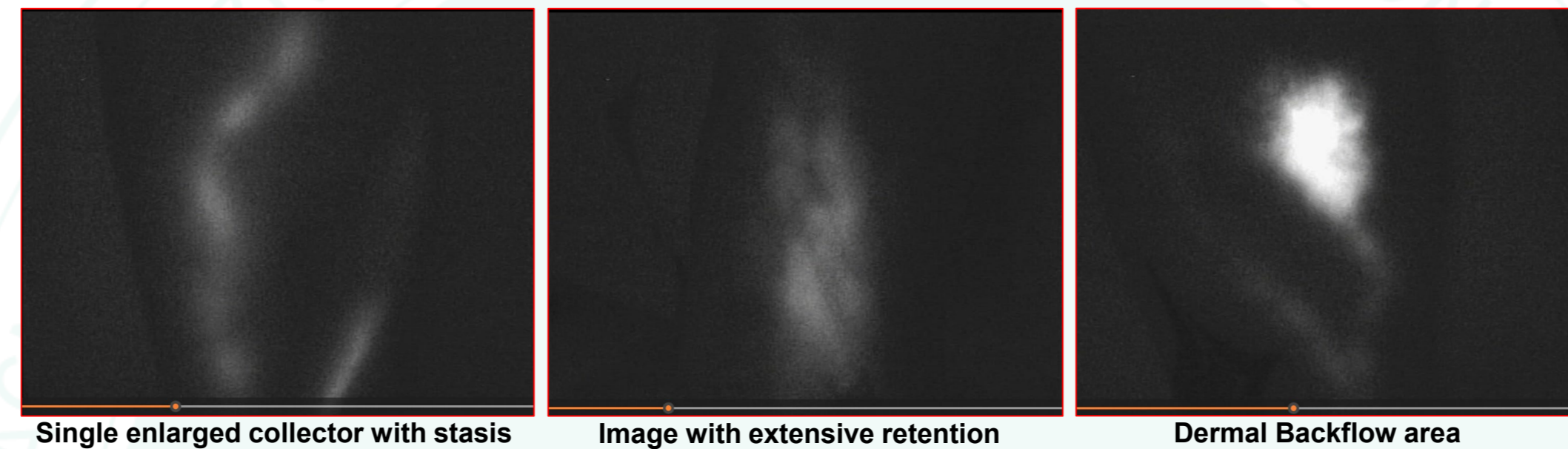
Background. ICG lymphography is a diagnostic method for observation of vascular function in the superficial lymphatic system, tissue fluid retention and extravascular drainage pathways. Lymphography provides an information enabling diagnosis and planning of personalized surgical or conservative treatment.

Manual lymphatic drainage (MLD) is a therapy for treatment of edema and chronic wounds associated with lymphatic, venous, or mixed insufficiency. MLD is a demanding therapy whose effectiveness depends on the therapist's adroitness.

Aim. The aim of this study is to demonstrate whether MMLD based on lymphography can improve its therapeutic effectiveness

Material and Methods. The effectiveness of MMLD compared to MLD performed according to E. Vodder's was assessed on a qualified group of 40 patients. All patients were diagnosed with unilateral leg edema, grade 2 according to the ISL, confirmed by a harmonized tonometric pitting test. All patients in the study group underwent ICG lymphography with lymphomapping. In both groups, 3D body scanning was performed immediately before and after MLD and MMLD to objectively assess limb circumference and volume before and after treatment. The duration of manual therapy was measured for each patient in both groups

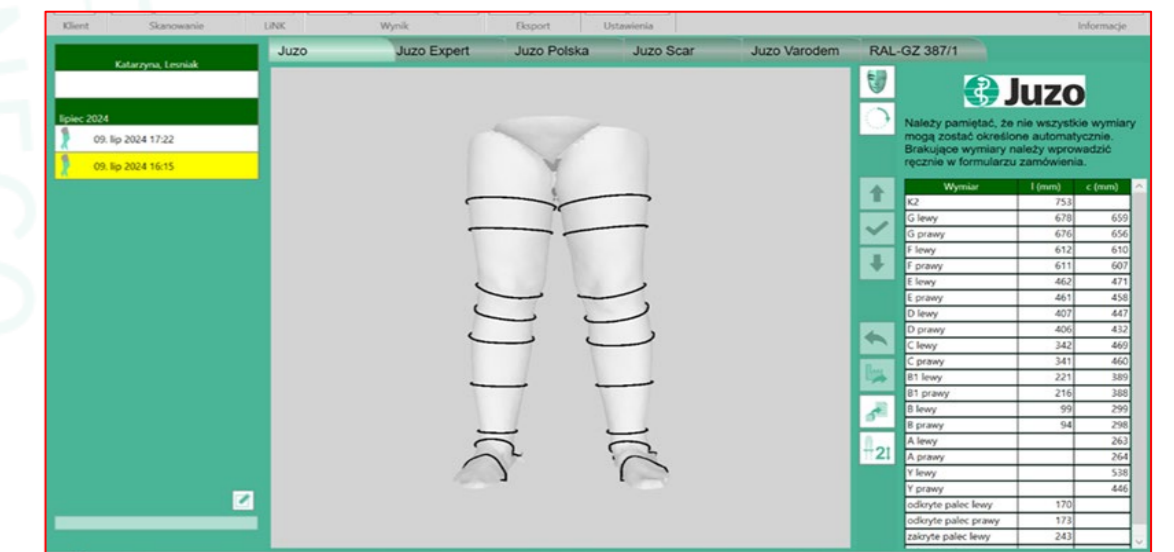
ICG lymphography images from which the mapping is based



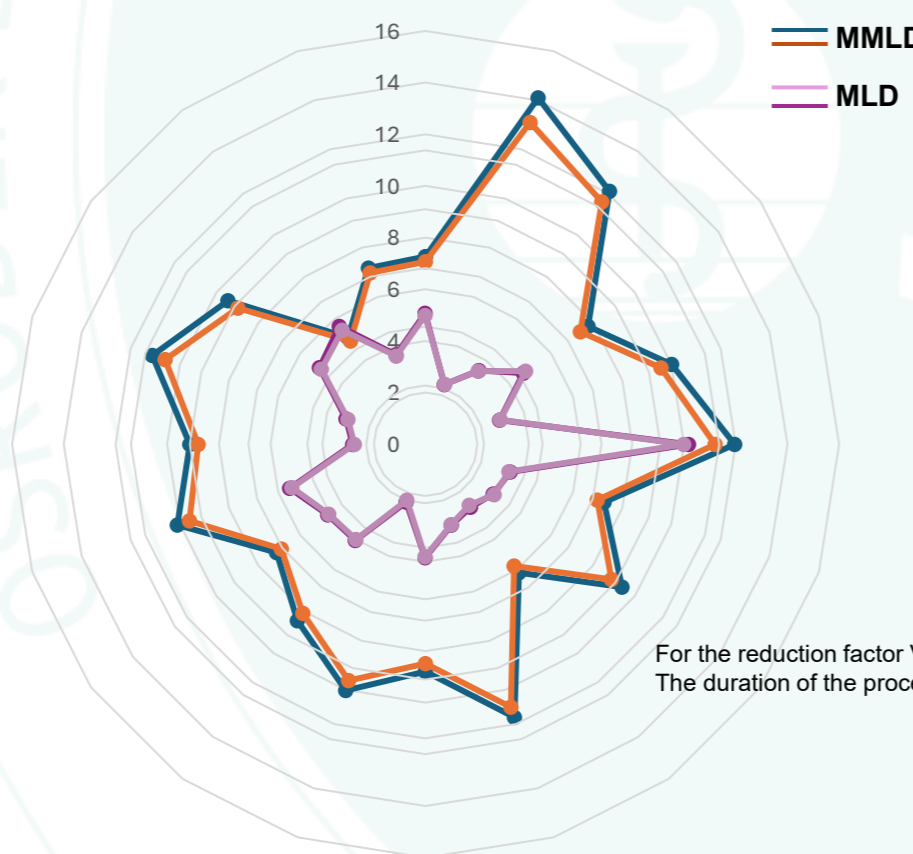
Example of mapping to perform MMLD



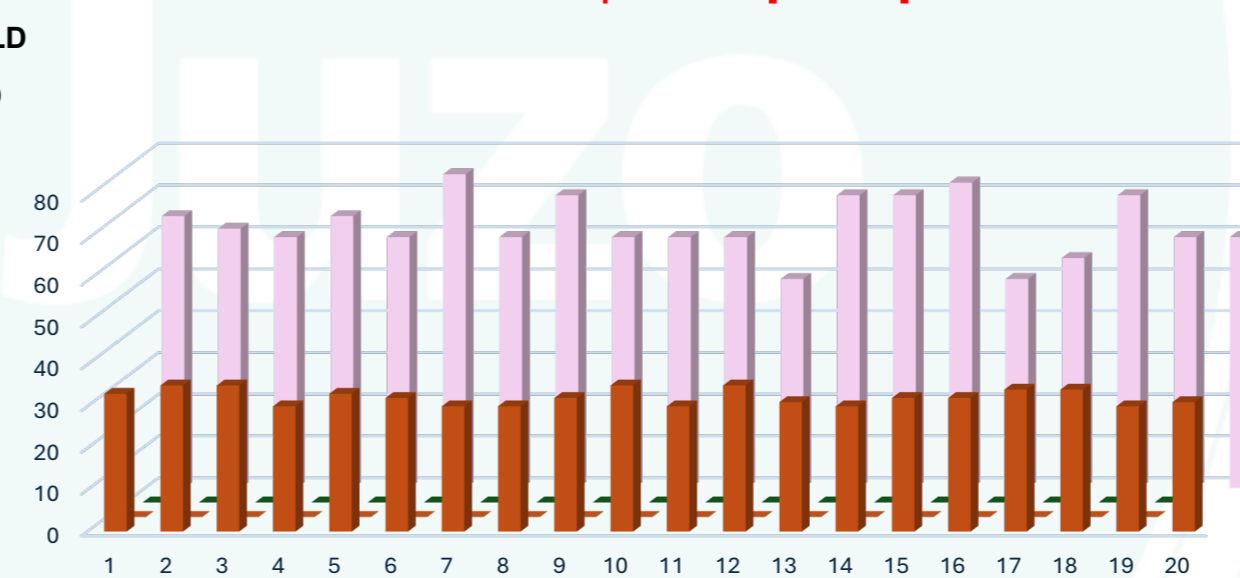
Example of 3D Scan for volume evaluation



Dynamics of volume changes in the MMLD and MLD group



Duration of procedure [minutes]



For the reduction factor V_k/V_p , $Z = 7.005$, and $p = 0.000$, which suggests a statistically significant difference between the groups. The duration of the procedure also showed a statistically significant difference ($Z = 11.700$, $p = 0.000$)

Results. The analysis of limb volume before and after manual therapy showed that the group with MMLD achieved a 4-times better reduction of volume, comparing to the the control group with classic MLD. The mean time required to perform MMLD was 2-times shorter comparing to classic MLD.

Conclusions. MMLD shows significantly higher efficacy than MLD while significantly shortening the time needed for therapy. ICG lymphography should be considered as an effective tool for personalizing and optimizing conservative anti-congestive therapy.