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COMPRESSION THERAPY OF INJURED SWOLLEN LOWER LIMBS- TISSUE FLUID HYDRAULICS, CLINICAL EFFECTS

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Introduction: Removal of edema tissue fluid (TF) from injured tissue is indispensable for healing, irrespective whether it is an open or closed wound.

Aim: To apply mechanical compression enabling TF to overcome tissue resistance and be transferred to non-swollen regions.

Methods: We studied hydraulics of tissue fluid in swollen lower limb (lymphedema, venous insufficiency with ulcers, posttraumatic hematoma) using sequential pump with no deflation of distal segments, wick-in-needle pressure, plethysmography and tonometry.

Results: Minimum TF pressures enabling its flow ranged between 25 and 30 mmHg. To reach this level, in ulcers in lymphedema and postthrombotic syndrome with fibrotic skin, pressures in sleeve should be raised above 120 mmHg. Tonometry measuring skin rigidity skin helps to choose proper inflation pressures. Comparing the TF flow dynamics during manual and mechanical sequential massage, efficacy of the latter was evidently higher. There was lack of TF back-flow and centripetal movement of TF was fast. Moreover, hand applied pressure could not be standardized.

Conclusions: In 8 lymphedema stage III/IV patients with ulcers recently treated with inflation pressure 120mmHg, no distal deflation, 6 months, 1 hour a day, a decrease in calf girth by 5-7 cm was obtained and no debulking surgery was needed.