

# A high force 3 x 30 min compression method of foot and calf removes most edema fluid and enables immediate usage high compression garment and prevent fluid leakage and ulcer development

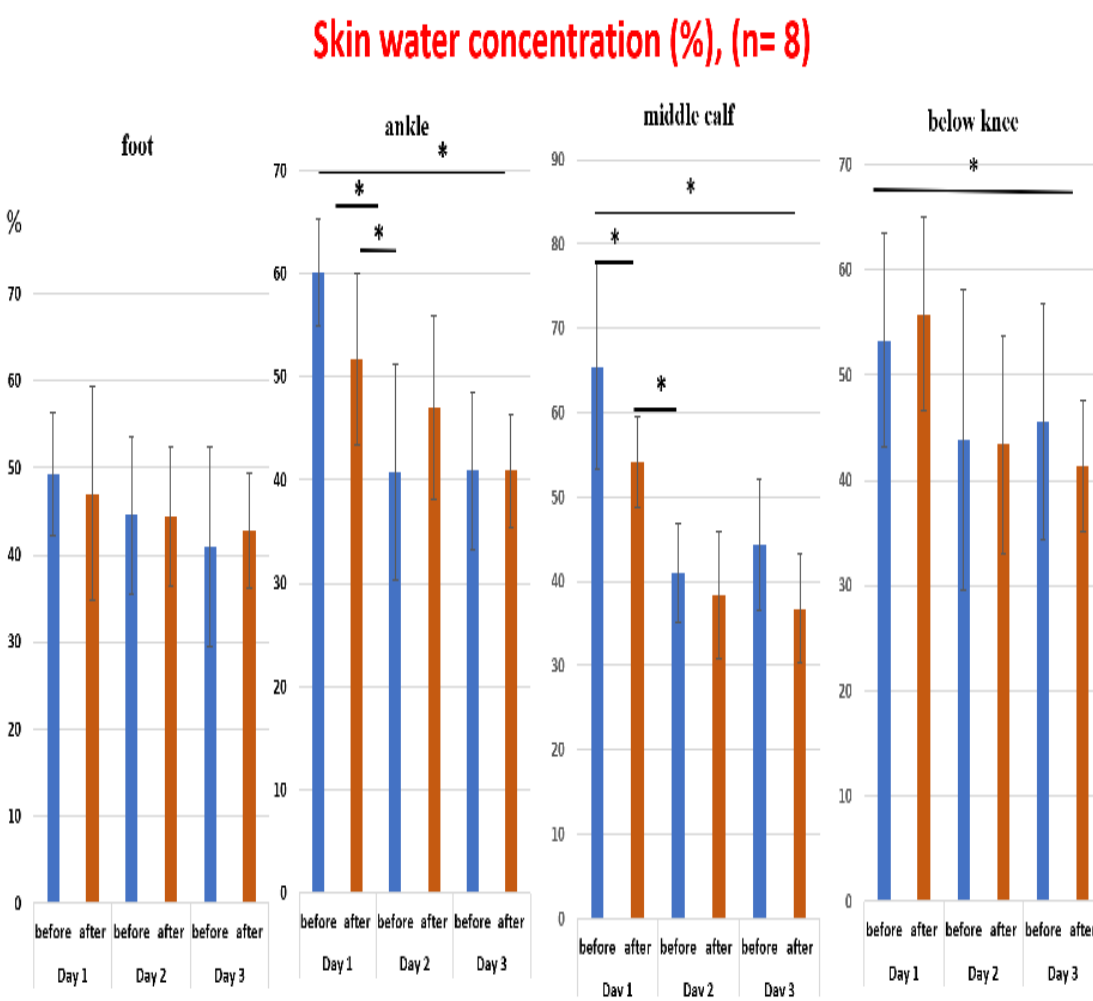
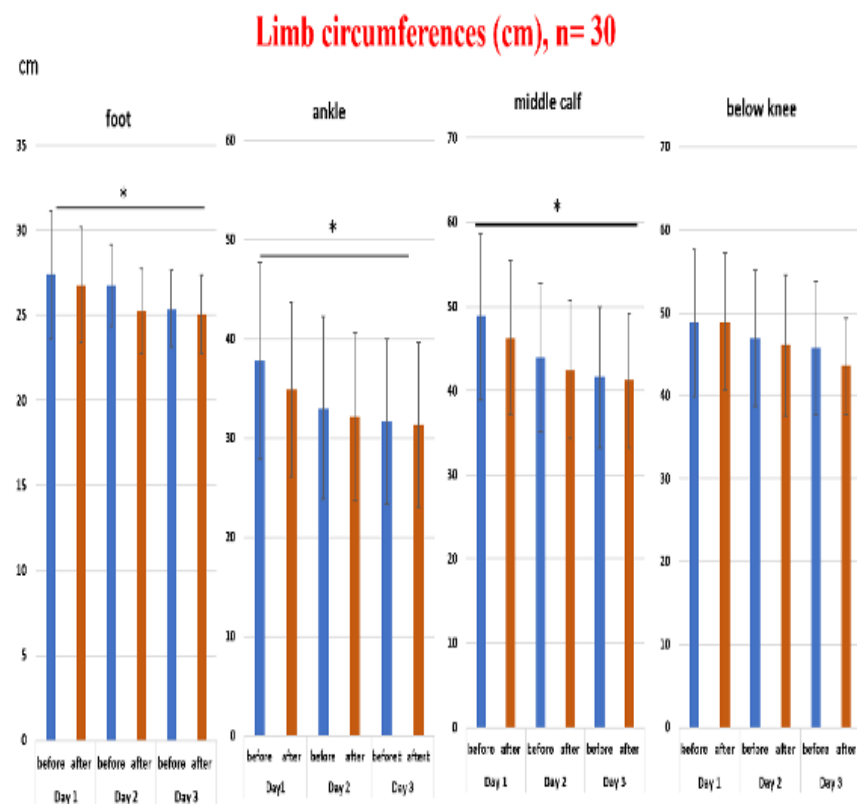
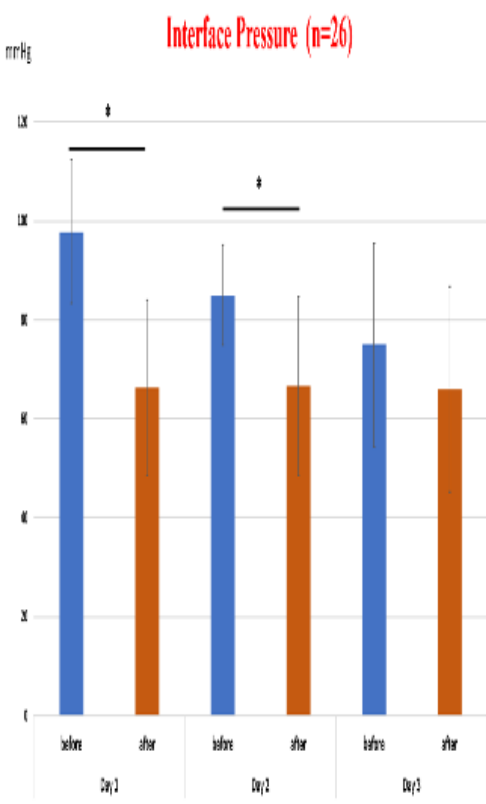
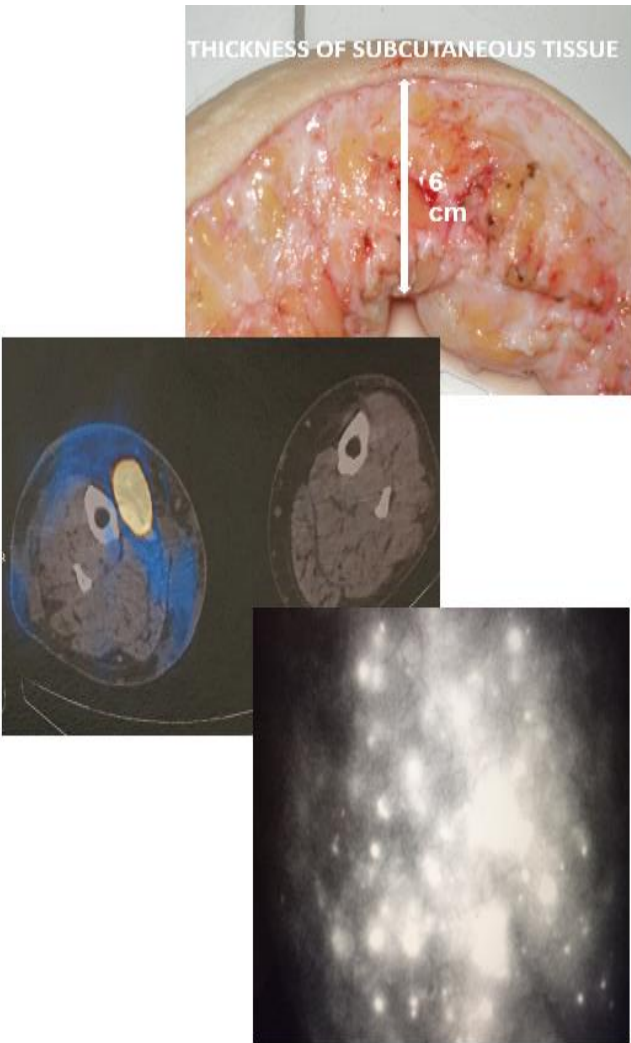
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**Background.** In advanced lymphedema of lower limbs, stage III and IV bandaging under the routinely applied pressure of 30-50mmHg remains largely ineffective. This is caused by the skin's and subcutaneous tissue's stiffness due to fibrosis. Edema fluid accumulates in multiple “lakes” which can be seen in the ICG lymphography. Evacuating the stagnant fluid requires high external compression force and subsequent adjustment of non-stretch stockings to the decreased limb size to prevent fluid leakage and ulcer development.

**Aim.** To apply elastic rubber bandaging of foot and calf under the pressure of 90 to 125mmHg for 30 min on three consecutive days and evaluate fluid evacuation volume on plethysmography.

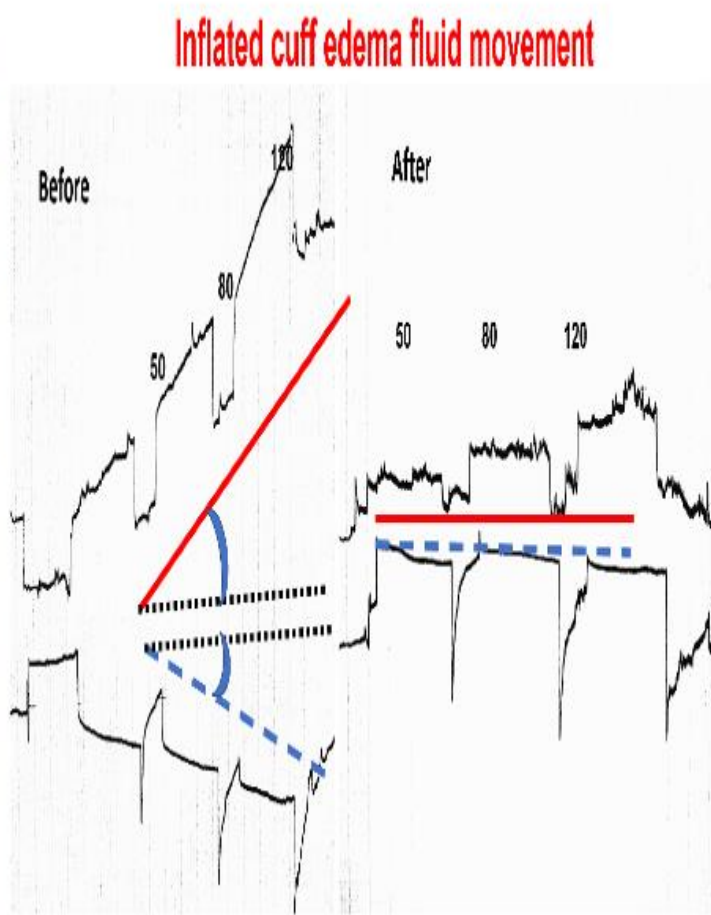
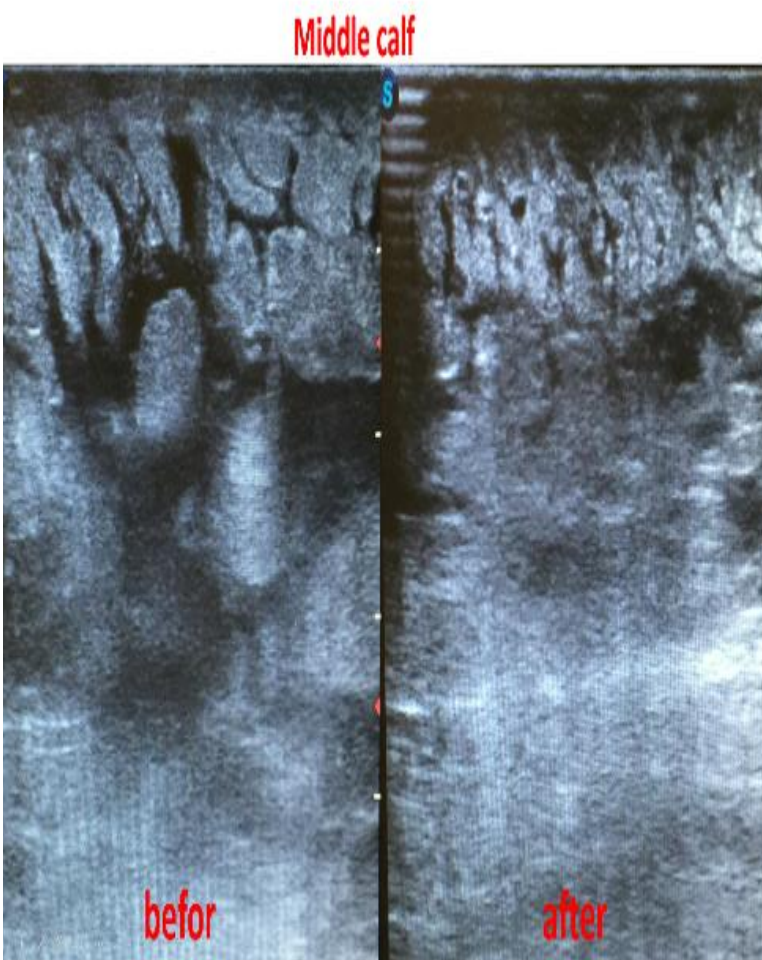
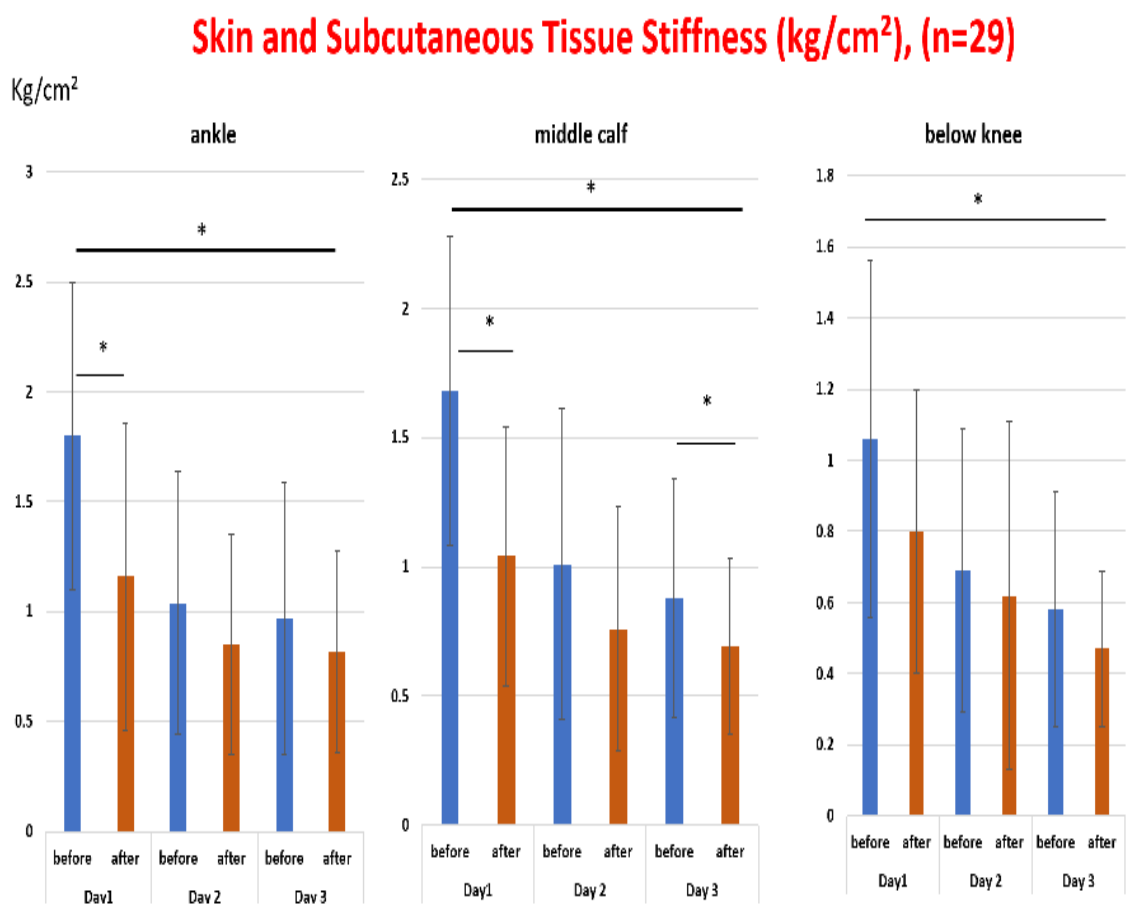
**Materials and methods.** Thirty lower limbs in 21 patients with lower limb lymphedema stage III of post-inflammatory type were included. Excluded were patients with acute inflammatory symptoms, venous thrombosis, profuse varices, obesity, and cardiac insufficiency edema. A 10 cm wide rubber bandage was applied to the foot and calf. The interface pressure on Picopress was 90 to 130 mmHg. Deep tissue tonometry, leg circumference, and drop of interface pressure were measured. Strain gauge plethysmography was done before and after compression..



## RESULTS

er three consecutive days of high-pressure compression followed by short-stretch bandaging :

- Interface pressure dropped by 32.6% on day I, 22.4% on day II, and 11.2% on day III
- Limb circumference decreased by 16.2% in the ankle, 15.9% in the middle calf, and 10.7% below the knee
- Skin water concentration decreased by 31.9% in the ankle, 43.8% in the middle calf, and 22.5% below the knee
- Deep tissue stiffness decreased by 46.1% in the ankle, 58.9% in the middle calf, and 45.3% below the knee
- Skin stiffness decreased by 50% in the foot, 37.9% in the ankle, 69.6% in the middle calf, and 27.7% below the knee
- Plethysmography and US images showed less mobile fluid in the lower limb tissues.



**Conclusions.** High pressure 30 min leg compressions can remove excess edema fluid within three days and enable adjustment of pressure non-stretch stockings and prevent further destructive changes as fluid leakage and ulceration. This method is more effective at the beginning of therapy than the standard 30-50mmHg bandaging as it provides an immediate effect.