

**FLUORESCENCE MICROLYMPHOGRAPHY: DIAGNOSTIC POTENTIAL
IN LYMPHEDEMA AND BASIS FOR THE MEASUREMENT OF
LYMPHATIC PRESSURE AND FLOW VELOCITY**

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ABSTRACT

Fluorescence microlymphography (FML) is an almost atraumatic technique used to visualize the superficial skin network of initial lymphatics through the intact skin of man. Visualization was performed with an incident light fluorescence microscope following subepidermal injection of minute amounts of FITC-dextran 150,000 using microneedles. Emanating from the bright dye depot, the surrounding network of microvessels is filled, documentation performed by photography or video film. In congenital Milroy lymphedema, a lack of microlymphatics (aplasia) is typical while in other primary lymphedemas and in secondary lymphedema after mastectomy or irradiation of proximal lymph nodes, the network remains intact but the depicted area is enlarged. Lymphatic microangiopathy characterized by obliterations of capillary meshes or mesh segments develops in phleboedema with trophic skin changes, progressive systemic sclerosis and Fabry's disease. In lipedema, lymphatic microaneurysms are stained. Microlymphatic pressure may also be measured using FML. For this purpose, glass micropipettes are inserted into the capillaries by means of a micromanipulator and pressure is determined by the servo-nulling technique. Normal subjects produced significantly lower pressure (7.9 ± 3.4 mmHg) compared to patients with primary lymphedema (15.0 ± 5.1 mmHg, $p < 0.001$). This characteristic lymphatic hypertension may be improved by complex physiotherapy or local application of prostaglandins. Additionally, a modification of the FML procedure can be used to measure lymphatic capillary flow velocity in controls and patients.

FML is suited to confirm the clinical diagnosis of lymphedema, contributes to distinguish among various forms of edema, and is useful in clinical research. In addition, FML has also become a tool for experimental animal studies including the depiction of gastric microlymphatics, the measurement of flow velocity in the naked mouse tail, and in evaluation lymphangiogenesis in a model of Milroy disease.