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MICROCIRCULATION IN PATIENTS WITH POSTTHROMBOPHLEBITIC LYMPHEDEMA OF THE LOWER LIMBS

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Abstract:

Relevance. In diseases of the veins of the lower extremities, they entail secondary changes in the lymphatic system of various severity and volume.
Materials and research methods. 92 patients with post-thrombophlebitic lymphedema of the lower extremities were examined. In order to determine the state of microcirculation, transcapillary diffusion along the veno-venous gradient was studied. In order to study the resorption and transport capabilities of the lymphatic system, the method of indirect lymphoscintigraphy was used. The level and monitoring of oxygen tension in the tissue were studied.
Results. In patients with post-thrombophlebitic lymphedema, a dysfunction of lymphatic drainage was revealed, there are pronounced disorders of microhemo- and lymphocirculation in the affected limb.
Conclusions. In patients with post-thrombophlebitic lymphedema, it is necessary to correct not only venous insufficiency but also lymphatic drainage in the complex treatment of this category of patients.

Keywords: post-thrombophlebitic lymphedema of the lower extremities, the state of lymphatic drainage

INTRODUCTION. Patients with venous vessel disease of the lower limbs not only does not decrease every year, but there is a clear tendency for their growth, they have become not only a medical, but also a social problem[3],[4],[5],[6],[8]. The high frequency of unsatisfactory results in the treatment of diseases of the veins of the lower extremities is often explained by the fact that changes in the venous system entail secondary changes in the lymphatic system of varying severity and volume. Being one of the key links in the system of homeostasis and humoral transport, the lymphatic system is involved in all pathological processes. [1],[2], [7], [9].

THE PURPOSE OF THE STUDY. To study the features of lymph flow and its effect on microcirculation in patients with postthrombophlebitic lymphedema of the lower limbs.

MATERIALS AND METHODS. In the period from 2015 to 2023, 92 patients with postthrombophlebitic lymphedema of the lower extremities were studied in the department of thoracic and vascular surgery of the clinic of the Andijan State Medical Institute and on its basis at the city hospital. The study included patients with a duration of chronic venous insufficiency of 3 years and more. Edema was observed in 94% of patients. They reached a significant degree in some patients, their prevalence depended on the localization and extent of the pathological process. Due to the progression of the disease, 26% had a trophic ulcer of the shin. In this group of patients, hyperpigmentation appeared in 67% of patients due to the development of fibrous tissue in subcutaneous tissue and in the skin, and induration in the lower third of the lower leg appeared in 40% of patients. In 12% of patients, there were more or less pronounced phenomena of cellulite, dermatitis or eczema.

Transcapillary diffusion along the veno-venous gradient was studied in order to determine the state of microcirculation. The degree of liquid filtration and protein penetration through the capillary wall was determined by comparing hematocrit and protein content. Protein loss was calculated using the Landis formula per 100 ml of blood. In order to study the resorption and transport capabilities of the lymphatic system, the technique of indirect lymphoscintigraphy with the radiopharmacological drug technefit 99Ts labeled with technetium 3-5 mb was used. The study was carried out on a Gamma camera MV 9200 manufactured in Hungary with a Microsegans computer. The level and monitoring of oxygen voltage in the tissue was performed by us on the TSM-2 radiometer "Denmark" device with a Clark type contact sensor. In this group of patients, the results of ultrasound Dopplerography of the veins of the lower limbs were studied, 20% had an occlusive form of lesion, 42% recanalized and 38% partially recanalized.

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THE RESULTS AND THEIR DISCUSSION. In the study of patients with PTFS, there were significant violations in transcapillary metabolism. The amount of the capillary filter increased to 13.2±0.30 ml, the protein loss was 4.10±0.15%, and there was also a decrease in the blood sodium content in the regional bloodstream to 137.11±0.32, (Table 1). Thus, due to the increased release of protein and sodium from the venous part of the microvascular bed, there is a decrease in oxygen-osmotic pressure, which leads to filtration of the liquid part of the blood into the tissue and an increase in the osmotic pressure of the extracellular fluid, which further leads to edema and deterioration of tissue trophism.

Table 1.
The state of transcapillary permeability in patients with postthrombophlebitic lymphedema and (n –= 50)

The clinic forms of examination of the patients	Quantity cap.filter. (ml)	Loosing protein(%)	quantity of sodium M.mol/l
Posttromb. syndrome.	12,3±0,3 P<0,001	3,80±0,15 P<0,1	142±0,32 P<0,1
Control group of healthy persons (n – 22)	2,05±0.11	2,08±0,12	148±0,14

As microcirculation is disrupted, the trophic supply of tissues worsens, as evidenced by the existing significant violations in the delivery and utilization of oxygen in them. The study of redox processes in order to assess disorders of tissue metabolism using transcutaneous oxygen deposition. So the oxygen voltage in the tissues decreased and was in the range from 32 to 47 mmHg. The increase in the level of TcPO2 after the oxygen sample was in the range of 68-75%, the oxygen capacity of the tissues decreased to 17-21 mmHg. table 2. Thus, according to TsRO2 data, it can be concluded that this group of patients had significant violations of oxygen delivery to the tissues of the affected limb.

Table 2.
Transcutaneous oxygen tension in tissues in patients with postthrombophlebitic lymphedema of the lower limbs (n – 62)

The clinic forms of examination of the patients	C2tk level, mm Hg	TsRO2tk.with oxygen heating. (%)	Acid capacity of tissues mmHg
Postthrombophlebitis syndrome.	32-47 P<0.05).	68-75 P<0.05).	17-21 P<0.05).
Control group of healthy persons (n – 25)	**57**	**90-95**	**53**

In the radionuclide study in patients with postthrombophlebitis syndrome, the lymph flow rate in the limb was 9.6 ±1.3 mm/min, and the intensity of radionuclide excretion within 1 hour was 15%. So, this group of patients had a pronounced violation of lymph circulation in the affected limb. In the control group of healthy individuals, it is presented in Table 3.

Table 3.
The rate of lymph flow and the intensity of RFP excretion from the tissue depot in patients with postthrombophlebitic lymphedema of the lower limbs (n – 38)

Clinical forms of the examined groups	Lymph flow rate (mm/min)	Intensive removal of RFP from depo tissues (%) in 1 hour
postthrombophlebitic lymphedema of the lower limphes	8,4 ±1,3 P<0,01	13 P<0,01

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The control group is healthy individuals (n – 20)	14,1	24

CONCLUSION. Thus, in patients with postthrombophlebitic lymphedema of the lower limbs, due to impaired function of both venous and lymphatic drainage, there are pronounced violations of microhemo- and lymphocirculation in the affected limphes. This leads to a metabolic disorder that worsens the development and outcome of the pathological process. This indicates the need to correct not only venous but also lymphatic drainage in the complex treatment of this category of patients.

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