THE CONTRIBUTION TO THE MODERN THEORY OF LYMPHANGION BY THE PERM SCHOOL OF LYMPHOLOGY

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BACKGROUND: The knowledge about lymphangion as a structural unit of lymphatic vessel, that contain myocytes and has a contractive activity was first revealed by Borisov A., 1982 and then proved physiologically (Orlov R, et al, 1984). International Clinical Lymphology Center is involved in further development of the modern theory of lymphangion & lymph flow and its clinical applications since 1983.

METHODS: We studied structure and functions of lymphangions of heart and thoracic duct of human and mammals in physiologic, experimental (lymphostasis model) and pathological conditions applying morphological, physiologic, pharmacological and endovascular methods.

RESULTS: Valve bases of heart lymphangions contain myocytes (Garyaeva, 1987), named afterwards musculus tensor valvulae lymphaticae (Borisov, 1993). The discovery clarified the role of valve apparatus in propulsion of lymph. Valves of thoracic duct lymphangion are allocated helically, that conforms to the theory of curvilinear symmetry. The angel between the former two valves is 90°, whilst the angle between all following valves varies from 0° to 180°. The connecting line of valves' commissural points is located lengthwise the thoracic duct and named "the valvate spiral" (Garyaeva, 1996).

The alterations in walls of heart and thoracic duct lymphangions were studied on the model of lymphostasis (Garyaeva 1987-1996) and divide in three periods.
1. Edema, dissection and damage of wall elements.
2. Hypertrophy and hyperplasia of myocytes.
3. Fibrosis and atrophy of muscular layer that decrease and afterwards block the motor function of lymphangions.

CONCLUSIONS: Pump function of lymphangion is based both on the presence of morphological substrate (muscle of cuff) and on spiral allocation of valves in lymphangions. Timely correction of lymphangions' transport function is critical for prevention of lymphostasis consequences - visceral and somatic lymphedema.

Further experimental and clinical research is targeted on development of pharmacological methods to influence the lymphatic system and its transport function.