The LN ones have the complex (e.g. with the lymphoid tissue in the walls), or the lymphoid lymphangions structure, which, simultaneously, are being regulated the lymph volume and its composition. The LN capsule muscular network (e.g. the nodal lymphangion muscular cuff) is being connected with the LV lymphangions and the border valves with them, by means of the muscular bundles in the continuous lymphatic channel composition.. The LPC valves are very thin, and they have a form of the cells' small thickening in the LPC of the first order. The LPC one is being consisted in the intervalvular segments without the myocytes presence just in the walls. The movable interendothelial contacts in the LC walls have been organized, as the intramural mini – valves. They are, constantly, being regulated the tissue fluid filtration just in the LC cavity – e.g. its outflow from the tissue channels into the lymphatic channel. The endothelium intramural valves are being found in the opening of the LC segments, and the LPC real valves – at the outlet just from the LC (network). The surrounding them tissues, including – the muscular ones, are being played the cuff role for the LC and the LPC intervalvular segments.

Conclusion

The lymphatic channel intervalvular segments with the different structure are being organized the lymph partial movement just from the organs to the veins, under the lymph flow proper energy deficiency conditions. The lymph flows channels are being taken their place only under the extravasal factors influence in the non – muscular sections (e.g. the tissue fluid flow pressure and the surrounding tissues), the LV and the LN contractive activity mechanism is being switched on, at their energy insufficiency just in the muscular sections.

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STRUCTURE OF THE BLOOD-TISSUE METABOLISM

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Substances move from metabolic microvessels to the tissue channels and back, through the endothelium in their areas of microvasculature. I suggest that this microvascular-tissue complex should be called a "domain of hemo-tissue metabolism". Transport vessels unite the domains into a common system. Domain configuration is determined by the structure of a vascularized area. In the mesentery between two mesothelium layers is a loose connective tissue, veined with a network of different microvessels. A hollow organ can be presented as a sheet rolled in a pipe; muscular layers divide it into membranes with a multilayer microvasculature, and microcirculatory channels of external layers overlap the transport vessels, going from the inner layers. Formation of folds, villi, crypts, acinuses and lobules leads to an adequate deformation of the domain. They have a network structure: thin fascicles of connective tissue fibers and capillaries form loops of a microvascular-fiber network. Inside the loops, is a dense network of thinner connective tissue fibers and tissue channels. They unite blood and lymphatic microvessels as "functional anastomoses": connective tissue fibers and hydrophilic amorphous substance act as an external cuff, restricting the tissue channels from widening and directing the substance current into the microvessels with a different wall permeability.

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LYMPHATIC AND LYMPHOID SYSTEMS

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While immunity is in the spotlight, lymphatic vessels are being regarded as appendage of the lymphoid system. In the international anatomic terminology (New-York, 1998), there is no such term as «lymphatic system». Section «Cardio-vascular system» describes lymphatic ducts and trunks, mentions lymph nodes, but their detailed description is given in section «Lymphoid system». In my opinion, lymphoid and lymphatic systems are interconnected in the peripheral parts and are specialized areas of a common cardiovascular system. The core of the lymphatic system are lymphatic vessels that transport the tissue fluid and large-grain particles, which did not get into blood channels. In the lymphoid system, the central position occupy blood vessels that provide lymphocyte circulation. Lymphocytes gather in the area invaded by antigens and along their pathway in the organism. Primary lymphatic tracts, capillaries and postcapillaries are characterized by higher wall permeability. That is why antigens penetrate into their openings, lymphoid nodes and patches form around the source (tissue channels) and roots of the lymphatic channel before and after human's birth, and lymph nodes – around lymphatic vessels with endothelial walls outside the organs, at a 3-5 month fetus.

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SKELETON OF THE MICROCIRCULATION

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Structure of connective tissue or skeleton of microcirculation is presented by rings of dense connective tissue around the main microvessels and their large branches. From the rings of the outline network branch the trabecules with terminal arterioles and collecting venules, towards the network of the metabolic microvessels. They branch, thin and disperse into loose connective tissue in alveoles, surrounded by capillaries. The alveoles of the metabolic network are filled with dense network of thin and differently directed fibers of connective tissue and hydrophilic amorphous substance; they form the walls of the tissue channels. Skeleton of microcirculation, besides its supporting function, can also act as an external cuff for the metabolic microvessels and tissue channels: limit the «spreading» of the tissue fluid from the alveoles of the metabolic network and direct its current from the tissue channels into the metabolic microvessels with different wall permeability. Apparently, the microcirculation has a modeling effect on stroma's fibro-architectonics in its area, till the inclusion of the differentiating connective tissue into the vessel wall. Histo- and morphogenesis of the microcirculatory soft skeleton at different levels of its organization resembles a transition of the bone tissue from fibrous to lamellar, spongy and compact.

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DEVELOPMENT OF THE THYMUS AND SPLEEN

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Lymphatic channels and lymphoid structures cooperate with each other to provide hemostasis in the body. This is indetermined by their set up in close association with veins. Lymphatic channels differentiate as a collateral part of the venous bed excluded from the blood flow. Spleen and thymus lie off the transport conduits that carry lymph, as well as the red bone marrow. Unlike the other lymphoid structures, they do not participate in lymph drainage from other organs; and in the process of evolution and ontogenesis, they form together with the predecessors of the lymph vessels – venous sinuses. Lymphatic «instability» of thymus, spleen and the red bone marrow is their typical feature from the moment of their formation, when mesenchymal cells cluster around venous sinuses, where the blood flow slows down and the blood gets a better contact with the perivasal tissue. The rest lymphoid structures originate in association with lymphatic sacs or vessels. Their forerunners are the merging lymphatic clefts, which appear from the pockets, separated from the primary veins. Lymphocytes begin to colonize a lymphoid organ after peripheral lymph collectors have been formed – intercleft membranes collapse, and decay products of other structures (antigens) get inside.

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THE VASCULAR BED DEVELOPMENT PHYSIOLOGY

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The vascular bed development is begun just from the endothelial primordia proliferation and also the embryo protocapillary network formation. Its irregular growth and the differentiation, including the magistralization and the reduction are taken their place by the increasing pressures gradient, in connection with the organs' growth and the histogenesis: 1) the centrifugal magistralization (e.g. just from the heart to the organs) by the shortest way; 2) the arteries in their development are outgrown the veins; 3) the great vessels are divided just into the branches to the multiple organs and their parts; 4) the anastomoses (but to be more specific – the magistralization) formation among the branches of one and the various magistrals. The vessels development is, practically, defined by the blood flow and the homotissue metabolism correlation. The metabolites transmural diffusion currents are exerted their «washing» effect upon the endothelium and also the subendothelial layer of the connecting paratenons, they disjoin the cells' and the molecules' contacts, that is inhibited the collagenous fibers morphogenesis, this is stimulated the capillaries growth and the neoplasms. The diffusion is, rapidly, become extinct just in the thickening and callous vessel's wall, the blood pressure mechanical constituent just on the wall is kept in its thickness. The metabolic currents are considered by me, as the growth inductor and the microvessels branchings, the hemodynamic factor – as their magistralization inductor. The lymphatic capillaries, «having non – functioned» the heart, which is the main blood flow motor, and the arterial bed, are kept the «embryonic» structure (e.g. the thin endothelium just without the basilar membrane), in contrast to the blood capillaries.