Morphological Studies on Liver Lymphatics

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Summary

Form, distribution and structure of liver lymphatics were studied in pig, calf, kid, dog, rabbit and human using both light and electron microscopes. The relation of the lymphatics to both blood vessel and connective tissue was the same throughout the material. The lymphatic capillaries were supported by a lattice of the coarse bundles, composed of collagenous fibers. The endothelial cells of the lymphatic capillaries lying in the meshes of the lattice showed a marked change in the volume and a phagocytic activity. The results were discussed in relation to the function.

Form and distribution of collecting vessels and draining channels showed some differences among the animals and man. The relation of the lymphatics to both blood vessel and connective tissue was, however, the same throughout the material. The intrahepatic lymphatics could be subdivided into two systems:

1. Peri-portal and ductal system,
2. Peri-hepatic vein system.

The lymphatics of both systems could be demonstrated by injection of India ink into the capsular lymphatics. The entire lymphatic system of the liver formed an unit by the intercommunication of the lymphatics. The space of Disse had no direct communication with the lymphatics. There existed a lattice of the coarse bundles, which forms a specific pre-lymphatic passway (Fig. 1). The characteristics of the liver lymphatics indicated in this study were as follows: The fine intrahepatic lymphatics communicated directly with the extremely

Capsular and intrahepatic lymphatic vessels have been examined with both the light and electron microscopes. The resin casting method was employed for visualizing of three dimensional arrangement of the lymphatics. The animals used in this study were pig, calf, kid, dog and rabbit. Human livers were also examined.

Fig. 1 Scanning electron micrograph of a pre-lymphatic passway in Glisson's capsule of a normal human liver showing a lattice of coarse bundles of collagenous fibers and a fine network of reticular fibers

x 1700

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large capsular lymphatics (Fig. 2). The endothelium of the lymphatic capillaries both in the Glisson's capsule and in the wall of hepatic vein were directly surrounded by thick collagenous bundles without basal lamina (Fig. 3, 4). On the other hand, the collecting lymphatics were surrounded by the loose connective tissue, in which elastic fibers and smooth muscle cells were scattered (Fig. 5). The lymphatic capillaries in the Glisson's capsule showed two different features, even in a section: thin endothelium and wide lumen in one part, thick endothelium and extremely narrow lumen in another part (Fig. 6). The difference was remarkable in the capillaries as compared with that of the collecting lymphatics. The combined observations by scanning and transmission electron microscope indicate

Fig. 2 Scanning electron micrograph of a resin casting of lymphatics in a pig liver showing communication of a network of lymphatic capillaries in the Glisson's capsule with that of capsular lymphatics. x 85

Fig. 3 A portion of two adjacent endothelial cells of a lymphatic capillary (L) in the Glisson's capsule of a rabbit liver showing numerous vesicles and several lysosomes (Ly). A hemidesmosome-like structure is present on the abluminal surface. Collagenous bundles (C) can be seen just outside the endothelium. x 18720
that the endothelial cells of the lymphatic capillaries can temporarily distend in the meshes of the lattice of the collagenous bundles, in which tissue fluids are to be pooled and, a marked change in the volume of the endothelial cells corresponds to the absorption and expelling of the protein rich tissue fluids. Thus, the existence of the lattice of the thick collagenous bundles plays an important role in the absorption and movement of the lymphatics. In addition, it is noted that the endothelial cells of the lymphatic capillaries lying in the meshes of the lattice showed a high phagocytic activity. The observations indicated that the endothelial cells of the lymphatic capillaries in the liver may in a wide sense belong to a cell of the reticuloendothelial system.
References


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International Society of Lymphology Forthcoming Conventions

7th International Congress of Lymphology

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Tissue Fluid Pressure and Composition

A satellite meeting of the II. World Congress for Microcirculation on “Tissue Fluid Pressure and Composition” will be held at the University of California, San Diego, La Jolla, California, July 19–21, 1979.

Description of Meeting

This meeting will correlate the latest scientific advances in tissue fluid pressure and composition with recent clinical applications. The program brings together acknowledged experts in basic science and clinical fields of tissue fluid pressure and tissue composition. Each subject will be approached from theoretical as well as practical viewpoints. The first day will examine the origin of hydrostatic and osmotic pressures in tissue and blood, interstitial composition, lymph composition, pulmonary edema and transcapillary protein transport. The second day will emphasize whole organ and clinical implications of tissue fluid pressure in brain, kidney, lung, intestine, heart, muscle compartment syndromes, and other forms of trauma. Each speaker will be followed by a 15-minute discussion period. The third day (half-day session only) will cover techniques for measuring tissue fluid pressure (capsule, servo-null micro-pressure system, clinical infusion, clinical wick catheter), followed by recent findings, discussions, and demonstrations of each technique.

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