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LYMPHATIC SYSTEM OF THE RAT PANCREAS

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ABSTRACT

Light and electron microscopy combined with morphometric analysis were used to investigate the distribution, extent and structure of lymphatic vessels in the head, body and tail of the rat pancreas. Serial sections 3-4 μ m in thickness were cut from tissue fixed by perfusion. Alternate sections were processed for light microscopy. Intervening sections were left uncovered to be re-embedded and sectioned for electron microscopy as needed. Vessels with valves were tentatively identified as lymphatics using the light microscope, with final identification being made on adjacent sections by electron microscopy. The ultrastructure of the pancreatic lymphatic vessels was typical of lymphatics generally. Interlobular lymphatic vessels were present throughout the pancreas and were found to be associated primarily with blood vessels lying in connective tissue septa. Intralobular lymphatics were also seen but were comparatively rare. Only about 19% of the wall of the lymphatic system of the pancreas was in close relationship to acinar cells, none was closely related to the endocrine islets. The mean volume density of the system was $0.0012 \text{ } \mu\text{m}^3 / \text{mm}^3$ and the profile density of lymphatics was $3.24 / \text{mm}^2$. Special attention was paid to the areas of contact between adjacent endothelial cells. Open gaps of more than 30 nm in width were rare. Dilatations and associated cytoplasmic processes, suggestive of a type of intercellular transport, were seen in addition to the intracellular cytoplasmic vesicular system. The findings are consistent with the view that the lymphatic system of the pancreas does not have a specific role in the transport of pancreatic secretions other than the removal of macromolecules that may escape to the interstitium in small amounts under normal circumstances. The fine structure of the endothelial wall suggests that the mechanism of lymph formation in the pancreas is more comparable to that in other encapsulated organs such as the kidney and liver than to that in the dermis or diaphragm where fluid appears to enter lymphatics primarily by way of gaps between adjacent cells.