Evidence for Nontraditional Lymphatics in the Choroid

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Within the anterior eye, like the peripheral circulation, lymphatics preserve tissue fluid balance and immune cell recirculation¹; however, the choroid does not consistently exhibit conventional lymphatics, and the system for removal of excess interstitial fluid and antigen-presenting cells from the posterior eye is not yet well understood. The presence of lymphatic-like features in the choroid might, to some extent, perform transport roles assigned to typical lymphatics² and could have clinical implications in inflammatory eye diseases like uveitis, diabetic retinopathy, and macular edema. In the current study “Evidence For Lymphatics in the Developing and Adult Human Choroid,” Koina et al.³ evaluated structural and molecular evidence for a system of lymphatic-like structures in the human choroid using ultrastructural (TEM) and lymphatic-specific immunohistochemistry in choroidal specimens at several phases of development. Compared with choroidal blood vessels, TEM reveals a comparatively rarified network of fine lymphatic-like channels or sinuses, although definite outflow pathways could not be confirmed. This study found diaphanous CD34⁺/VEGFR3⁺ complexes in the early choroid and D240⁺ structures in the aged choroid. Although choroidal LYVE-1⁺ macrophages, but not classical lymphatics, have been reported in the postnatal choroid,⁴ this study shows LYVE-1⁺/CD39⁺ and D240⁺ macrophages closely associated with lymphatic-like channels in both early and adult human choroids. Interestingly lymphatic-like development was found to follow blood vessels, with both spreading outward from the optic nerve head. Currently the ontogeny, (Prox-1-mediated reprogramming versus lymphatic progenitor fusion), drainage pathways and fluid transport function of these structures still remain unclear. Whether inflammatory conditions particularly diabetes, might generate or expand channels like the fine lymphatic-like features described in this report and whether they function as collectors requires further study, but could potentially represent a novel mechanism for regulating fluid homeostasis and immune functions in the choroid.

References


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