Adult Human Choroid: An Alymphatic Tissue?

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The choroidal vasculature in all species has a critical role in maintaining the health and welfare of the RPE and photoreceptors. De Stefano and Mugnaini¹ showed elegantly that the chicken choroid has lymphatic vessels as well as blood vessels. They used transmission electron microscopy (TEM) as well as paracentesis to demonstrate absence of erythrocytes in the large lacunae-like vessels until paracentesis was performed. However, the presence of lymphatic vessels in mammalian choroid, especially human, is controversial. A consensus statement from Schroedl et al.² stated that definitive proof of lymphatics requires multiple lymphatic markers to be present in the same structures. More recently, Koina et al.³ investigated human choroid with TEM as well as immunohistochemistry using antibodies against several lymphatic markers: LYVE-1, podoplanin, Prox-1, VEGFR-3, and VEGF-C. The majority of structures that had colocalization of lymphatic markers were found in fetal human choroids and not adult humans. Transmission electron microscopy demonstrated “blind-ended lymph sacs external to choriocapillaris” in adult human choroid as well as anchoring filaments in these structures that lacked RBCs, fenestrations, fragmented, and/or absent basal lamina, and had infrequent pericytes.

In the current issue of IOVS, Schrödl et al.⁴ have done the most thorough investigation of lymphatics in adult human choroid to date. They used antibodies against six known markers for lymphatics (LYVE-1, podoplanin, PROX1, FOX2C, VEGFR-3, and CCL21) and used skin as a positive control tissue, since lymphatics are well documented in skin. Although individual marker localization was found in choroidal cells and structures, they did not find colocalization of the lymphatic markers in any structure in adult human choroid. In this extensive investigation of lymphatics they found no evidence of classic lymphatic vessels in adult human choroid.

References

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