ABSTRACT

Novel threadlike structures, so-called Bonghan ducts (BHDs), were recently rediscovered inside large caliber lymphatic vessels using two different staining dyes in rabbits (Janus green B and Alcian blue) and fluorescent nanoparticles in rats. These three methods have the drawback of injecting chemical agents into the lymphatic vessels, which might damage the BHD and hinder further investigation of its physiological function. New methods to observe BHDs without using external chemical agents need to be developed. In the present work, we introduce a contrast enhancing optical method for in vivo observation of BHDs floating inside large caliber lymph vessels. The method uses a low-pass filter above about 650 nm, with an arrangement to minimize the light reflected from the surface of the lymph vessel. We captured films showing movement of a BHD as the animal respired. Applying the previous Alcian blue injection technique, we obtained BHD samples from the lymph vessel and observed the distribution of rod-shape nuclei (the essential feature of a BHD). BHDs can now be observed inside lymph vessels by using contrast-enhancing instrumentation without visualizing chemical agents.