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Diagnosis of CAV in OCT Scans From Heart Transplanted Patients

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It is with great interest that we read the present article by Orban et al[1] regarding atherosclerotic plaques in long-term heart transplanted (HTx) patients. We find the use of optical coherence tomography (OCT) in detection of cardiac allograft vasculopathy (CAV) intriguing, as the sole use of coronary angiography is encumbered with a high degree of ambiguity and low sensitivity for CAV when compared with OCT.[2] We realize that images in publications might not reflect the applied analysis, but the authors' interpretation of essential findings in the presented OCT scans is a matter of concern.

In Figure 1 by Orban et al,[1] the authors demonstrate a representation of different OCT findings. Although the figure illustrates common findings in a HTx population, we disagree on the representation of lipid plaque in Figure 1C by Orban et al.[1] According to international consensus, a lipid plaque is characterized by signal-poor, diffusely delineated regions with high attenuation and low light penetration depth, and the plaque is located within the intimal layer of the vessel.[3] The presented image in Figure 1C by Orban et al.[1] deviates from the above on several essential points as presented in Figure 1. First, the annotated plaque marked with red is more signal rich than an area containing mainly lipids would be. Second, the plaque has clear borders. Third, the plaque attenuates light to a low degree, as the deeper media and adventitia layers are partly visible. Fourth, the plaque is located in the vessel lumen and not inside the intima layer. Because of the tissue's homogenous appearance with low attenuation, smoothened surface, and location on and not within the intimal layer, we suggest this to be an organized mural thrombus. This is in line with histological findings[4] and a previous study rendering probable the presence and organization of repeated and multiple mural arterial thrombi as a key mechanism in the development of CAV in HTx patients.[5]

It is a matter of concern if the failed identification of what appears to be the most important indicator of progressing CAV is a single mistake or could point to a systematic problem with the presented analysis. We therefore suggest the authors to present a more thorough and transparent description of their OCT analysis with clear definitions of tissue characteristics.

Routine clinical follow-up with OCT for early detection of CAV in HTx patients seems very promising; however, careful evaluation of OCT scans to ensure that organizing thrombus and regular atherosclerotic processes are separated and quantified correctly may be very important for diagnosis and future optimization of medical therapy for this group of patients.

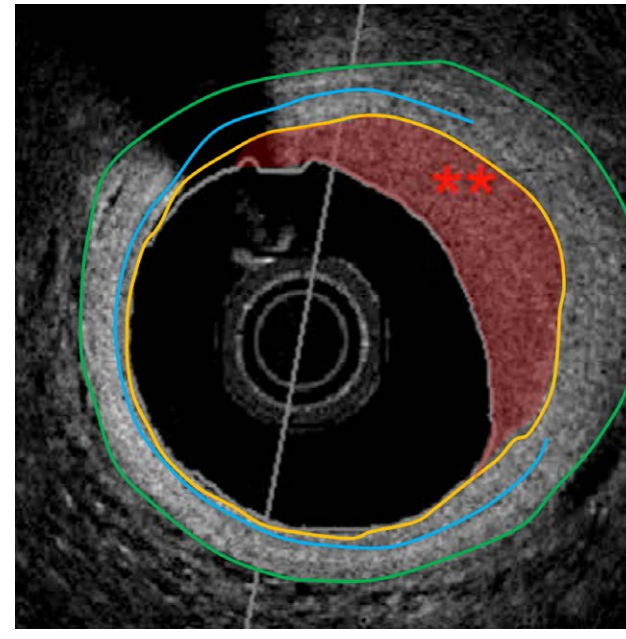

FIGURE 1. This image is borrowed from the present study by Orban et al.[1] We have inserted colored areas for explanation. Red area: homogeneous tissue with low attenuation indicative of organized thrombus inside the vessel. Yellow line: luminal intima surface. Endothelium is not visible by OCT. Blue line: partly visible media layer. Green line: adventitia layer. The tissue indicated by the red area is located on and not within the intimal layer. OCT, optical coherence tomography.

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