Pulmonary vein stenosis after radiofrequency ablation: in vivo optical coherence tomography insights

Angel Sanchez-Recalde*, Raúl Moreno, and José L. Merino

Hemodynamics and Interventional Cardiology Unit, Cardiology Department, University Hospital La Paz, 1ª Planta Diagonal, Paseo de la Castellana 261, Madrid 28046, Spain

* Corresponding author. Tel: +34 91 727 7290; E-mail: recalde@secardiologia.es, asanchezr.hulp@salud.madrid.org

A 56-year-old woman with paroxysmal atrial fibrillation refractory to medical treatment developed left inferior pulmonary vein (LIPV) stenosis 3 months after catheter ablation. Radiofrequency was delivered at the antrum of the vein, but some ostial applications were needed to achieve vein disconnection at the carina between both the left PV. She complained of cough and effort dyspnoea. Computed tomography angiography showed severe proximal stenosis in the LIPV, and percutaneous intervention for stent implantation was planned. Vein pulmonary angiography showed an ostial stenosis of the LIPV (Panel A). Optical coherence tomography (OCT) is an imaging technique that provides high-resolution (up to 10–20 μm) in vivo cross-sectional images, and showed homogeneous high backscattering areas corresponding to fibrous plaque secondary to radiofrequency-induced lesion (blue asterisks, Panels B and C). Also, it was remarkable the presence of microvessels in some areas into the fibrous plaque (blue arrows, Panels B and C), and the existence of several white thrombi that are platelet rich and exhibit low signal attenuation, without backscattering (red arrows, Panels D–F). The distal reference segment of the LIPV is shown in Panel G (white asterisk refers to residual blood artefacts). The entire vein wall was not completely visualized at this level due to the limited OCT penetration. A 6-mm bare metal stent was successfully deployed without pre-dilatation. As this case illustrates, OCT provides unique insights on the underlying mechanism of chronic radiofrequency ablative injury in the pulmonary veins, showing detailed ‘in vivo’ histology information, and guiding the percutaneous treatment.

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author 2014. For permissions please email: journals.permissions@oup.com.