

# Macrochannel recanalisation of the right coronary artery visualised with three-dimensional optical frequency domain imaging

Daniel R. Obaid\*, PhD, MBBCh; Stephen Dorman, MBBS; Alex Chase, PhD, MBBCh; David Smith, MD, MBBS

Morrison Hospital, ABM University Health Board, Swansea, United Kingdom

A 57-year-old male patient with a history of a medically managed inferior myocardial infarction 10 years previously underwent invasive catheter angiography. Coronary angiography revealed a patent right coronary artery with TIMI 3 flow and multiple linear filling defects (**Figure 1A**). Intracoronary imaging was performed with a “Lunawave®” optical frequency domain imaging catheter (OFDI) (Terumo Corp., Tokyo, Japan). This revealed that the right coronary artery had recanalised with the presence of a multiply septated lumen (**Figure 1B**). The OFDI images underwent three-dimensional reconstruction, allowing visualisation of multiple large spiralling channels (**Figure 1C**). The development of neovascular channels in chronically occluded coronary arteries has been described in histological studies with diameters >250 µm considered large<sup>1</sup>. The spatial resolution of OFDI allows detailed *in vivo* assessment of coronary intima previously

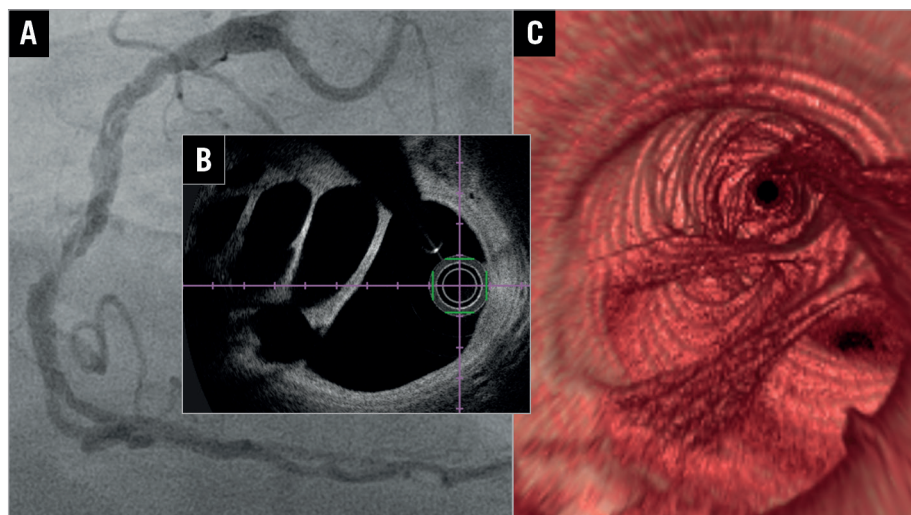
only possible with *post mortem* histology. We believe these are the first published three-dimensional OFDI images demonstrating the presence of multiple macrochannels, rather than microchannels, with diameters >1,000 µm separated by thin fibrous septa.

## Conflict of interest statement

The authors have no conflicts of interest to declare.

## Reference

1. Srivatsa SS, Edwards WD, Boos CM, Grill DE, Sangiorgi GM, Garratt KN, Schwartz RS, Holmes DR Jr. Histologic correlates of angiographic chronic total coronary artery occlusions: influence of occlusion duration on neovascular channel patterns and intimal plaque composition. *J Am Coll Cardiol.* 1997;29:955-63.



**Figure 1.** Coronary angiogram and OFDI imaging. A) Catheter angiography of right coronary artery (RCA) with multiple linear filling defects. B) OFDI of the mid RCA revealing multiple lumens. C) Three-dimensional reconstruction of OFDI showing recanalisation of the RCA with macrochannels and thin fibrous septa.

\*Corresponding author: Department of Cardiology, ABM University Health Board, Morrison Hospital, Heol Maes Eglwys, Morrison, Swansea, SA6 6NL, United Kingdom. E-mail: Daniel.R.Obaid@wales.nhs.uk