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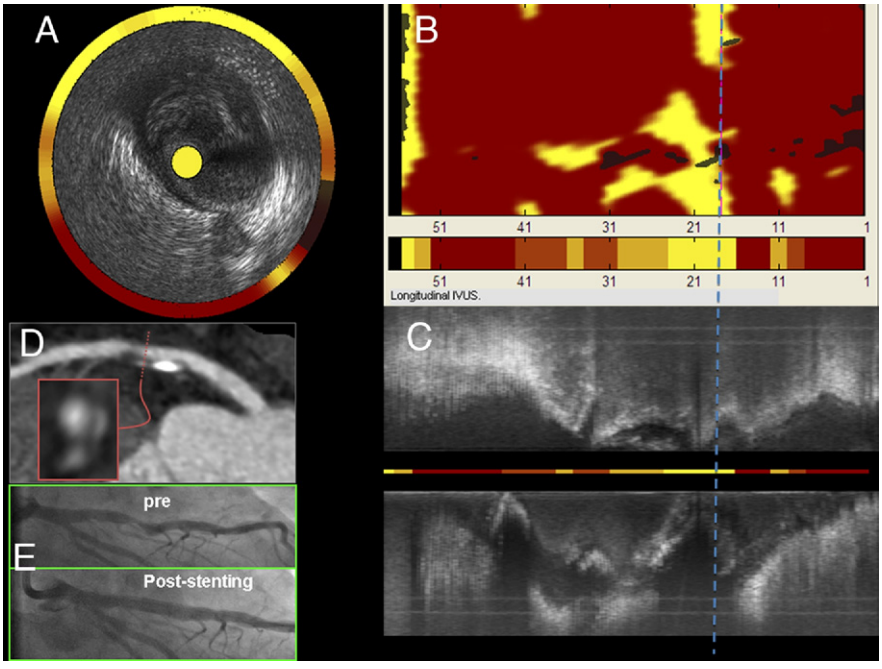
IMAGES IN CARDIOLOGY

First-in-Man Clinical Use of Combined Near-Infrared Spectroscopy and Intravascular Ultrasound

A Potential Key to Predict Distal Embolization and No-Reflow?

Carl J. Schultz, MD, PHD,* Patrick W. Serruys, MD, PHD,* Martin van der Ent, MD, PHD,* Jurgen Ligthart, MSC,* Frits Mastik,† Scott Garg, MD, PHD,* James E. Muller, MD,‡ Mark A. Wilder, MSC,‡ Anton F. W. van de Steen, MSC, PHD,† Evelyn Regar, MD, PHD*

Rotterdam, the Netherlands; and Burlington, Massachusetts



From the Departments of *Interventional Cardiology and †Biomedical Engineering, Thoraxcentre, Erasmus Medical Center, Rotterdam, the Netherlands; and ‡InfraReDx, Burlington, Massachusetts.
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A 57-year-old male with a previous myocardial infarction and primary stenting of the right coronary artery was admitted for treatment of a type A lesion in the proximal left anterior descending coronary artery **(E)**. Fractional flow reserve was 0.68, and complex partly calcific plaque morphology was seen on multislice computed tomography **(D)**. A novel intravascular ultrasound (IVUS) and near-infrared spectroscopic combination catheter demonstrated lipid-rich plaque extending almost 270° of the vessel circumference **(A to C)**. Direct stenting (everolimus-eluting, 3.5 × 18 mm) obtained an excellent angiographic result **(E)**. After the procedure, the patient experienced mild transient chest discomfort without electrocardiographic changes, but cardiac enzymes were elevated (troponin T 0.89 ng/ml, creatine kinase 239 U/l, myocardial band fraction 10%).

Distal embolization of disrupted lipid-rich plaque has been proposed as one potential cause of unanticipated myocardial injury after stenting and the no-reflow phenomenon. Combined near-infrared spectroscopy and IVUS offers a new method for investigating this "cheese grater effect" hypothesis, although further validation is needed.