

Cardiac Imaging

Multimodality Imaging of a Myocardial Infarction Culprit Lesion

ARISTOTELIS C. PAPAYANNIS, SUBHASH BANERJEE, EMMANOUIL S. BRILAKIS

VA North Texas Healthcare System and University of Texas Southwestern Medical Center at Dallas, Dallas, Texas

Key words:
Optical coherence tomography, near-infrared spectroscopy, imaging.

Manuscript received:
March 16, 2011;
Accepted:
July 20, 2011.

Address:
Aristotelis C.
Papayannis

Dallas VA Medical
Center (111A)
4500 South Lancaster Rd.
Dallas, TX 75216, USA
e-mail: aris.papayannis@yahoo.com

A 64-year-old man presented with non-ST segment elevation acute myocardial infarction. Diagnostic coronary angiography revealed occlusion of the proximal circumflex (Figure 1, panel A). After mechanical thrombectomy TIMI 2 flow was restored. Near-infrared spectroscopy with intravascular ultrasonography imaging demonstrated a large lipid core plaque at the occlusion site (located 14 mm from the left main bifurcation) (Figure 1, panel B) and optical coherence tomography revealed plaque rupture with overlying thrombus (Figure 1, panel C). After stenting, TIMI 3 flow was restored (Figure 1, panel D). Near-infrared spectroscopy demonstrated resolution of the lipid core plaque (Figure 1, panel E), and optical coherence tomography showed good stent expansion with intrastent thrombus formation (Figure 1, panel F) that improved after intracoronary administration of eptifibatide and additional mechanical thrombectomy. Our case demonstrates that multimodality invasive coronary artery imaging can provide detailed mechanistic insights into the pathogenesis

of acute coronary syndromes and supports the ongoing efforts for clinical validation of these novel imaging modalities.¹⁻⁵

References

1. Raghunathan D, Abdel-Karim AR, Papayannis AC, et al. Relation between the presence and extent of coronary lipid core plaques detected by near-infrared spectroscopy with postpercutaneous coronary intervention myocardial infarction. *Am J Cardiol.* 2011; 107: 1613-1618.
2. Abdel-Karim AR, Rangan BV, Banerjee S, Brilakis ES. Intercatheter reproducibility of near-infrared spectroscopy for the in vivo detection of coronary lipid core plaques. *Catheter Cardiovasc Interv.* 2011; 77: 657-661.
3. Garcia BA, Wood F, Cipher D, Banerjee S, Brilakis ES. Reproducibility of near-infrared spectroscopy for the detection of lipid core coronary plaques and observed changes after coronary stent implantation. *Catheter Cardiovasc Interv.* 2010; 76: 359-365.
4. Wood FO, Badhey N, Garcia B, et al. Analysis of saphenous vein graft lesion composition using near-infrared spectroscopy and intravascular ultrasonography with virtual histology. *Atherosclerosis.* 2010; 212: 528-533.
5. Van Velzen JE, Schuijff JD, De Graaf FR, et al. Imaging of atherosclerosis: invasive and noninvasive techniques. *Hellenic J Cardiol.* 2009; 50: 245-263.

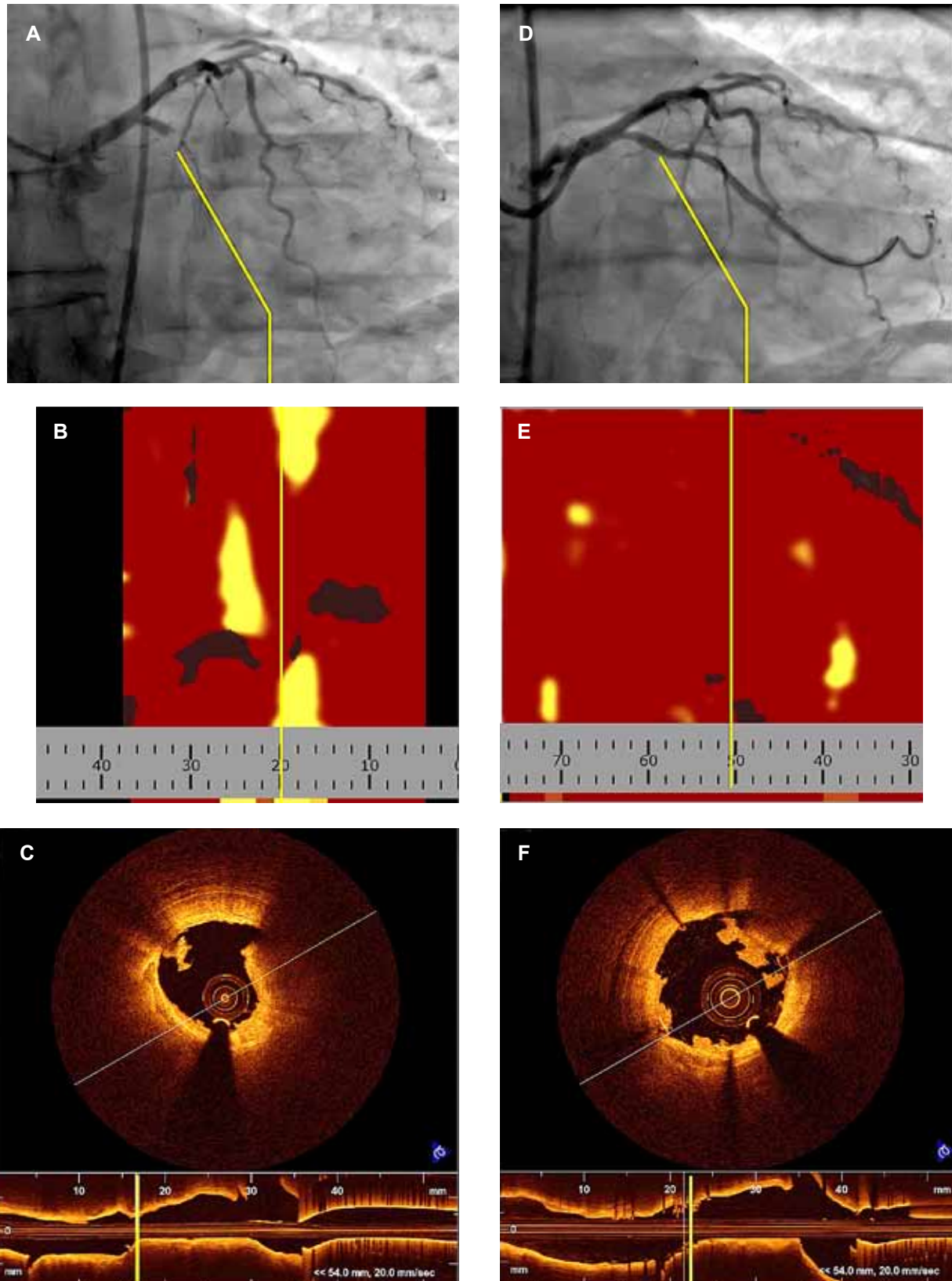


Figure 1. Occlusion of the proximal circumflex (panel A), associated with a large lipid core plaque by near-infrared spectroscopy (panel B) and plaque rupture by optical coherence tomography (panel C). Post-stenting restoration of antegrade flow in the circumflex artery (panel D), resolution of the lipid core plaque (panel E) and intra-stent thrombus formation (panel F).