vascular distribution in the 17-segment American Heart Association model.

The coronary supply of segment 12 (midanterolateral wall) remains controversial. Although Aepfelbacher et al. (2) reported that this segment is supplied by the left circumflex artery, as proposed by the American Heart Association model, we, in addition to Pereztol-Valdes et al. (3), found that this segment is more often supplied by the LAD. The diagnostic accuracy of midanterolateral involvement for a LAD stenosis/occlusion reached 80% in our study and 63% in the Pereztol-Valdes et al. (3) study. As stated by Dr. Danias, differences in methodologies and anatomical coronary variations may explain these disparities. Aepfelbacher et al. (2) included patients with either single or multivessel disease, with 42% of the cohort having previously undergone coronary revascularization. Pereztol-Valdes et al. (3) investigated patients with newly diagnosed single-vessel disease. The inclusion of patients with concomitant significant disease in the LAD and left circumflex territory might preclude appropriate registration in this particular segment.

The patient population used in our study included subjects who presented with an acute myocardial infarction to a single acute coronary occlusion. Additionally, the presence of previous myocardial scar in areas not corresponding and distinct to the infarct related artery was excluded. It should be also stressed that the use of cardiac magnetic resonance imaging allows the identification of the anterior and inferior right ventricular junction points, which in addition to the center of the left ventricular cavity, represent strong landmarks permitting a precise segmentation of the septum and left ventricular free wall. Further hybrid imaging studies that fuse the depiction of the coronary arteries as it courses on the left ventricular wall with functional imaging, like single-emission photon computed tomography/computed tomography, positron emission tomography/computed tomography, or cardiac magnetic resonance imaging angiography/perfusion, are warranted to clarify these disparities.

José T. Ortiz-Pérez, MD
Edwin Wu, MD

201 East Huron
Galter 10-240
Chicago, Illinois 60611
E-mail: ed-wu@northwestern.edu

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Clinical Coronary Chemograms and Lipid Core Containing Coronary Plaques

Recently, the U.S. Food and Drug Administration approved the use of a catheter-mounted near-infrared spectroscopy system (InfraReDx, Inc., Burlington, Massachusetts) for the identification of lipid core–containing coronary plaques. The readouts of chemical composition are called chemograms and lipid-rich areas are represented in yellow. The chemograms are presented as if the coronary vessel has been split open and is presented as a ribbon. The important landmarks such as major branches are

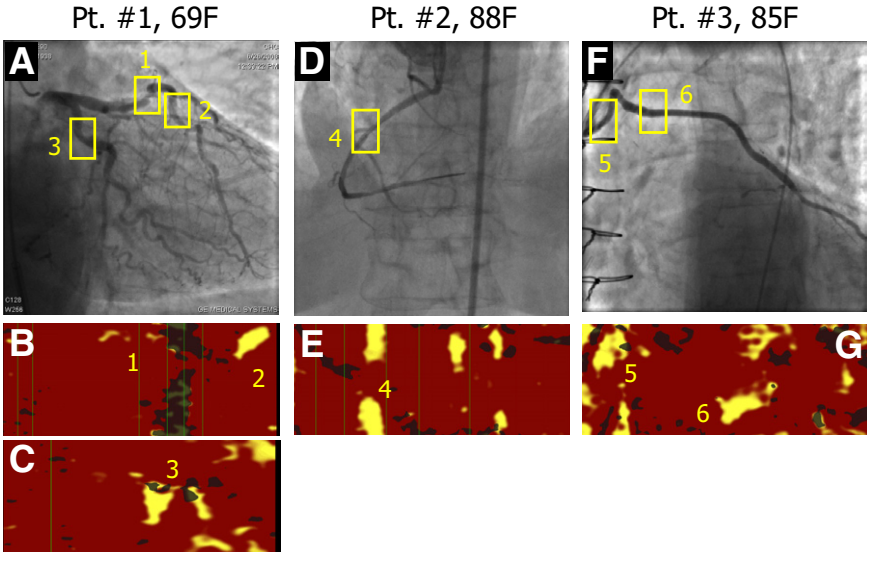

Figure 1. The Coronary Angiograms and Near Infrared Spectroscopy in 3 Patients

Coronary angiograms are presented in **A, D, and F** and spectroscopy results in **B, C, E, and G**. The **brown strip** shows the chemogram of the coronary artery as if it has been split open, wherein the **yellow color** represents lipid cores. The **green vertical lines** are landmarks, such as major coronary branches, for precise localization of lipid cores and comparison with coronary angiograms or intravascular ultrasound. The chemographic results correspond to the coronary lesions enclosed by the **yellow boxes** on coronary angiograms. Patients (Pt.) #1 and #2 demonstrate lipid-rich lesions in relatively mildly stenotic coronary lesions. The severely obstructive lesion does not show a lipid-rich plaque. The lipid-rich lesions were observed to be discrete in coronary vessels. However, the lipid accumulation is diffusely present in a saphenous vein graft in the third patient.

imprinted on the chemogram (as vertical lines) for precise localization of the lipid cores. The whole exercise is based on the premise that the lipid core volume is the most important determinant of vulnerability of plaque to rupture (1). Although intravascular ultrasound has proffered reasonable assessment of lipid cores by demonstration of hypoechoic zones, near-infrared spectroscopy reveals the definitive presence of lipid cores. Unlike ultrasound, it is also not affected by calcific deposits in the vessel wall. Since the recent approval of the catheter for clinical use, we have investigated all proximal coronary vessels during percutaneous interventional procedures in 3 patients in the last 3 weeks and would like to share our initial observations.

Figure 1 shows coronary chemogram from all 3 patients. First, a 69-year-old woman presented with a non-Q myocardial infarction. The chemogram indicated (Fig. 1A) a significantly obstructive lesion in the proximal (yellow box 1) and a mild lesion in the mid (yellow box 2) left anterior descending coronary artery. It also showed minimal luminal irregularity in the proximal left circumflex coronary artery (yellow box 3). Based on the chemogram, the obstructive left anterior descending lesion was not lipid-rich (Fig. 1B, 2), whereas the mild lesion showed bulky lipid core (Fig. 1B, 1). The region of luminal irregularity in the left circumflex artery also showed a large lipid core (Fig. 1C, 3). Similar to the circumflex artery of the first patient, the mid right coronary irregularity (Fig. 1D) in the second patient (88-year-old female) also showed chemographic evidence of a large lipid core (Fig. 1E, 4). Of note, the lipid cores were discrete lipid-rich lesions and no diffuse fatty distribution was seen. On the other hand, when we interrogated a saphenous vein graft from an 85-year old female, multiple lipid-rich areas (Fig. 1G, 5 and 6) were identified in the absence of any demonstrable luminal stenosis (Fig. 1F).

These preliminary results suggest that intravascular investigation of chemical composition of a coronary plaque has become a clinical reality. It remains to be seen whether chemograms would perform better than the ultrasound or whether they will be able to predict adverse events and facilitate development of clinically effective strategies for management of vulnerable plaques before it is too late.

***Brijeshwar Maini, MD, FACC**

*Co-Chair Cardiovascular Research, Pinnacle Health
1000 North Front Street
Wormleysburg, Pennsylvania 17043
E-mail: brij.maini@moffittheart.com

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