A 58-year-old man without a prior medical history was admitted for acute chest pain associated with ST depression in leads V1, V5, V6, and D1 with elevated serum levels of troponin and creatine kinase (peak creatine kinase level, 487 IU). A moderate-sized non–Q-wave myocardial infarction was diagnosed, and initial medical treatment included β-blockers, aspirin, and heparin.

A 16-slice CT scan was performed before conventional coronary angiography. Submillimeter-sized ECG-gated slices were acquired after injection of 90 cm³ of nonionic iodinated contrast medium. Images were reconstructed retrospectively at the diastolic phase. A short-axis reformat view showed hypoenhancement, suggesting vascular obstruction, in the subendocardial region of the anterolateral wall of the left ventricle (Figure 1). This finding led to subsequent 3D reconstruction, with a focus on the proximal part of the left coronary arterial tree. Proximal occlusion of a first obtuse marginal artery was evident (Figure 2), corresponding to the infarct-related artery. Additionally, 3-vessel disease with multiple lesions was depicted. The 3-vessel disease and the occlusion of the first obtuse marginal artery were confirmed by conventional coronary angiography (Figure 3). The patient underwent successful bypass surgery and was discharged from the hospital 7 days after surgical intervention, without complication.

High-resolution ECG-gated CT acquisitions allow for comprehensive imaging of acute myocardial infarction and an assessment, during the same examination, of the myocardial damage and the infarct-related artery.
Figure 2. Three-dimensional left superior view of the left coronary artery tree, using volume-rendering technique, shows interruption of a small first obtuse marginal artery (arrow). Note also irregular proximal left anterior descending artery and severe stenosis of a first diagonal artery (arrowhead). PA indicates left ventricle; RV, right ventricle; LA, left atrium; LAD, left anterior descending artery; Cx, circumflex artery; and LM, left main artery.

Figure 3. Conventional angiography confirmed occlusion of the obtuse marginal artery and severe stenosis of the first diagonal artery (arrowhead), on this right oblique view. Abbreviations as in Figure 2.
Sixteen-Slice Computed Tomography After Acute Myocardial Infarction: From Perfusion Defect to the Culprit Lesion
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