Coronary Computed Tomographic Angiography for Noninvasive Follow-up of Spontaneous Coronary Artery Dissection

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Clinical History
A 55 year-old woman without known risk factors developed sudden-onset, 3/10 chest pressure in the setting of a recent family tragedy. Her electrocardiogram revealed apical and inferior non-specific T-wave changes. Troponin-T peaked at 2.4 mg/dL. Emergent invasive coronary angiography was consistent with a distal left anterior descending coronary dissection without significant stenosis. Echocardiography confirmed globally preserved left ventricular function, but apical inferior wall hypokinesis. She was conservatively managed and discharged on dual-antiplatelet therapy, statin, beta-blockade, and ACE inhibitor.

At a 1 month outpatient follow-up visit, she noted intermittent chest discomfort. Coronary CT angiography (CTA) was requested to exclude extension of the dissection.

Findings
Invasive coronary angiography immediately after presentation revealed a large left anterior descending artery with abrupt luminal caliber change in the distal segment and extravasation consistent with dissection but TIMI grade 3 flow (Figure 1). Transthoracic echocardiogram demonstrated hypokinesis of the apical inferior segment (Figure 2). Luminal tapering without extravasation was evident at the site of prior dissection in the distal LAD. There was no evidence of progression when compared to the prior invasive angiography. Functional images on CT revealed normal myocardial systolic thickening, an improvement from the previously noted hypokinetic segments.

Discussion
Spontaneous coronary artery dissection is a rare cause of acute myocardial infarction. This disorder is more common in younger patients (under age 50) and in women. In particular, the risk of spontaneous coronary dissection is seemingly increased during the peripartum period and can be associated with fibromuscular dysplasia. Although the exact mechanism is unknown, an intimal tear or hemorrhage of the vasa vasorum have been postulated. The ideal treatment is unknown, but conservative management is thought to be prudent in stable patients.

In this case, coronary CTA offered a safe, noninvasive option to follow up a spontaneous coronary dissection and confirmed resolution of wall motion abnormalities in a young patient. Moreover, the complementary functional and coronary data were simultaneously obtained at a very low radiation dose (1.3 mSv).
**Figure 1:** Invasive coronary cine angiography demonstrates focal luminal narrowing (arrow) of the distal LAD with late extravasation at the site of an abrupt caliber change and dissection flap.

**Figure 2:** Transthoracic echocardiography in the parasternal long-axis view demonstrates apical inferior hypokinesis.

**Figure 3:** Maximum intensity projection image from the follow-up coronary CTA reveals unchanged distal LAD tapering (arrow) without extension and resolution of the prior extravasation. 128-slice second-generation dual-source multidetector coronary CTA was performed with prospectively-ECG-triggered technique, with a widened acquisition window (to acquire both coronary anatomy and myocardial function), resulting in a dose-length product of 91 mGy-cm, corresponding to an estimated effective dose of 1.3 mSv.

**Figure 4:** 2-chamber cine CT images from the same acquisition as figure 3 demonstrate resolution to normal of regional left ventricular function.

**REFERENCES**

