Spontaneous Coronary Artery Dissection
Nandini M. Meyersohn, MD; Robert M. Gallagher, MD; J. Sawalla Guseh, MD, Kimberly Parks, DO, Malissa Wood, MD, Sanjeev Francis, MD, Brian B. Ghoshhajra, MD, MBA

Clinical History
A 25-year old man with a history of mild asthma presented to an outside hospital with 12 hours of chest pain, nausea, and vomiting following strenuous weightlifting. ECG revealed an incomplete right bundle branch block and cardiac troponin-I was elevated at 0.4 ng/mL. Chest radiographs and non-gated CT pulmonary angiogram were normal. He was transferred to the MGH Emergency Department where ECG revealed inferior T-wave evolution and a rising troponin-T level which ultimately peaked at 1.38 ng/mL. He denied dietary supplements, substance abuse and risk factors for coronary atherosclerosis. Evaluation by cardiology in the ED raised concern for coronary artery anomaly, given his youth and clear association of his index chest pain with a degree of exertion exceeding his normal exercise routine. Coronary CTA (CCTA) was requested, given the late presentation and primary suspicion of congenital anomaly.

Findings
CCTA revealed no anomaly, but rather a long segment proximal to distal right coronary artery (RCA) dissection causing a total occlusion of the distal RCA and reconstitution of the posterior descending and posterior left ventricular arteries via collaterals. There was inferior wall hypokinesis and hypoenhancement, with left ventricular ejection fraction of 51%.

Intravascular heparin and eptifibatide were administered during admission for close hemodynamic monitoring. 2 days after CCTA, confirmatory elective invasive coronary angiography demonstrated the dissection with extensive thrombus burden in both the false and true lumen. Medical therapy was continued, and he was discharged home in stable condition 4 days after initial presentation on dual antiplatelet therapy and anticoagulation with enoxaparin. He re-presented with atypical chest pain 8 days later, and repeat angiography demonstrated near-total resolution of the dissection with complete resolution of the thrombus burden.
Discussion

Spontaneous coronary artery dissection (SCAD) is an uncommon cause of acute coronary syndrome (ACS) present on 0.07 to 1% of angiograms. SCAD is more common in females versus males (4:1), most commonly in the peripartum period (20-25% of cases). A significant proportion of SCAD patients have an underlying fibromuscular dysplasia or connective tissue disorder such as Ehlers-Danlos.

Ten-year recurrence rates for SCAD reach 29% with a mean time interval of 2.8 years. In patients with underlying connective tissue disorders including Ehler’s-Danlos, Loey’s-Dietz and Marfan syndrome, arteries may be more susceptible to injury, thus avoidance of multiple invasive angiograms is recommended to avoid further injury. As the average age of these patients is younger than the typical atherothrombotic ACS patient, CCTA may play an important role in ongoing surveillance after initial diagnosis.

Figure 1: Curved MPR reformatted image of the RCA demonstrates indistinct vessel margins (blue dashed line), and a dissection flap in the proximal and mid RCA (yellow and red arrows and corresponding inset short axis images) with complete occlusion of the distal RCA (red arrow and inset). Prospective ECG triggering second-generation dual-source low-kVp technique with iterative reconstruction algorithm was utilized, resulting in a total dose of 1.7 mSv, including functional evaluation.

Figure 2: Double-oblique short axis maximum intensity projection (MIP) image (inset) of the RCA demonstrates occlusion of the distal RCA (white arrowheads) with distal reconstitution of the posterior descending artery (PDA). Basal thick MPR cine image demonstrates inferior wall hypokinesis and subendocardial hypoperfusion consistent with infarction.

Figure 3: Invasive angiography 48 hours after admission demonstrates improved flow of the previously totally occluded distal segment, but extensive thrombus burden associated with proximal to distal right coronary artery dissection and obstructive stenosis of the mid and distal vessel.

Figure 4: Invasive angiography 12 days after presentation (8 days after discharge) demonstrates complete resolution of thrombus and near-total resolution of luminal stenosis, with only a minimal dissection flap evident in the mid RCA.

REFERENCES

