Acute Coronary Syndrome in a 44-Year-Old Woman

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A 44-year-old African American woman without traditional atherosclerotic risk factors or known coronary artery disease (CAD) presented to the emergency department with chest pain. She had 3 previous pregnancies (2 live births and 1 spontaneous abortion); her last child was born more than 5 years ago. Her chest pain began spontaneously 1 hour prior to presentation and was described as retrosternal with radiation to her upper and middle back.

On physical examination, her blood pressure was 128/88 mm Hg, her pulse was regular at 96 beats per minute, her respiratory rate was 16 breaths per minute, and her temperature was 36.9°C. Pulse oximetry was 100% in room air. The chest was nontender. Pertinent physical findings included normal central venous pressures, clear lung fields, normal first and second heart sounds, an audible fourth heart sound, and no murmurs. The electrocardiogram (Figure 1A) demonstrated anterior ST-segment elevations consistent with an anterior acute current of injury. Results from the chest radiography were normal. Initial troponin I concentration was 0.02 ng/mL but rose to 177.76 ng/mL over the ensuing 4 hours (the patient’s chest pain had resolved by this time). Urgent coronary angiography was performed (Figure 1B). Thrombolysis in myocardial infarction flow grade 2 was observed in the left anterior descending artery and second diagonal branch.

WHAT WOULD YOU DO NEXT?

A. Perform PCI to the left anterior descending artery and second diagonal branch with drug-eluting stents
B. Perform PCI to the left anterior descending artery and second diagonal branch with bioresorbable vascular scaffolds
C. Defer intervention and continue supportive management
D. Refer for emergency coronary artery bypass grafting surgery

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Diagnosis
Spontaneous coronary artery dissection

What to Do Next?
C. Defer intervention and continue supportive management

Discussion
The differential diagnosis for acute coronary syndrome (ACS) in a young woman includes traditional ACS due to plaque rupture, spontaneous coronary artery dissection (SCAD), coronary vasospasm, and traumatic coronary dissection. Coronary angiography demonstrated a left anterior descending artery and second diagonal branch type 1 nonatherosclerotic SCAD (NA-SCAD) (Figure 2).

Type 1 NA-SCAD is a nontraumatic, noniatrogenic separation of the coronary intima from its medial attachments, leading to intramural hematoma formation either due to the presence of an intimal tear or from rupture (and bleeding) of the vasa vasorum. Contemporary estimates attribute 0.1% to 4.0% of all cases of ACS to NA-SCAD, with 50% of patients presenting with ST-elevation myocardial infarction. Among women younger than 60 years, up to 35%...


of cases of ACS are due to this condition.2,3 The most commonly affected vessel is the left anterior descending artery, with multivessel involvement observed in up to 25% of patients.4 Risk factors for NA-SCAD include pregnancy, puerperium, and multiparity. Several systemic disorders have also been associated with this condition, including fibromuscular dysplasia (up to 75% of cases), systemic lupus erythematosus, polycystic nodosa, and Marfan syndrome.4

The diagnosis of NA-SCAD is challenging and requires a high index of suspicion, given that ACS in young women, particularly those lacking classical CAD risk factors, is uncommon. Angiography is the diagnostic test of choice, with 3 different angiographic patterns described. Type 1 NA-SCAD occurs because of intimal tear formation, as seen in Figure 2. Type 2 NA-SCAD, the most common variant, appears angiographically as a smooth, tubular luminal narrowing from intramural hematoma formation without the development of an intimal tear. Type 3 NA-SCAD, the least common

Figure 2. Selective coronary angiogram of the left coronary system in the anterior-posterior cranial projection. Note the visible dissection flap (arrowheads) in the mid left anterior descending, extending into the ostium of a large second diagonal branch (type I spontaneous coronary artery dissection), with intramural hematoma further down the second diagonal branch. Dissection of the first diagonal branch with thrombolysis in myocardial infarction I distal vessel flow is also seen.

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Clinical Outcome

The patient was treated conservatively and monitored in the coronary care unit for 4 days. Her left ventricular ejection fraction at discharge was 50%. Approximately 18 months later, the patient presented with ST-elevation myocardial infarction due to type 2 SCAD of the right coronary artery. This event was treated with drug-eluting stent implantation because of ongoing symptoms and electrical instability. She recovered uneventfully and continues to be observed as an outpatient, with no further events.