Acute Aortic Dissection Associated with Left Ventricular Dysfunction in a Postpartum and Normotensive Young Woman

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Abstract: Aortic dissection is uncommon in young women and is associated with clinical conditions such as pregnancy and Marfan's syndrome. Owing to the low incidence, diagnosis of acute aortic dissection in young women might be missed or delayed in patients who have neither risk factors nor typical clinical manifestations. We report the case of a 28-year-old postpartum woman with aortic dissection. The patient complained of abdominal discomfort, transient back pain, and general malaise at our emergency department 1 week after delivery of a healthy baby. She had no history of hypertension, connective tissue disease or congenital heart disease. Cardiovascular insult was not considered until the patient developed shock. Myocarditis or peripartum cardiomyopathy with left ventricular dysfunction was diagnosed based on imaging studies and cardiac enzyme levels. Finally, computed tomography revealed acute aortic dissection after hemodynamic collapse occurred. This case suggests that acute aortic dissection can be associated with left ventricular dysfunction, and non-specific clinical symptoms in young, normotensive, and postpartum women. A high index of clinical suspicion and alertness are needed to identify this condition.

Key words: Acute disease; Aneurysm, dissecting; Aortic aneurysm; Ventricular dysfunction, left

CASE REPORT

A 28-year-old female, gravida 2 and para 2, visited the emergency room 1 week after delivery of her second baby. She experienced mild transient back pain with sweating followed by intermittent periumbilical cramping pain, vomiting, and general malaise. On physical examination, her consciousness was clear and she described feeling weak. There was no Marfanoid appearance. Her blood pressure was 118/75 mm Hg, body temperature was 36.7°C, pulse rate was 68 beats/min, and respiratory rate was 16 breaths/min. Mildly distended abdomen, hypoactive bowel sound, and tenderness over the periumbilical area were noted. There was no rebound pain. The plain abdomen roentgenogram revealed distended stomach only. Serum amylase level was 277 mg/dL (normal, 25 to 125 mg/dL), serum C-reactive protein level was 24.6 mg/L (normal, < 5 mg/L), and serum lactate dehydrogenase level was 356 U/L (normal, 100 to 200 U/L). White blood cell count was 19.4 k/cm³ (normal, 3.2 to 9.2 k/cm³). Initial diagnostic work-up was focused on possible gastrointestinal and gynecologic problems but revealed no specific findings. Hypotension ensued half a day later. Serum cardiac markers showed creatine kinase
level of 471 U/L (normal, 35 to 235 U/L), MB isoenzyme of creatine kinase level of 45.34 ng/mL (normal, < 5 ng/mL) and cardiac troponin T level of 1.24 ng/mL (normal, < 0.1 ng/mL). Electrocardiogram disclosed sinus tachycardia, poor R wave progression, and diffuse T wave change over leads II, III, aVF, and V3-V6 (Fig. 1). Chest roentgenogram showed mediastinal widening and cardiomegaly (Fig. 2).

Emergent transthoracic echocardiography revealed global left ventricle hypokinesis with borderline performance (left ventricle ejection fraction by M-mode was 45%), mild aortic regurgitation, and a small amount of pericardial effusion. Peripartum cardiomyopathy or myocarditis was suspected. Chest computed tomography was performed and revealed abnormal mediastinal shadow and aortic contour. An episode of severe back pain occurred after the end of the examination, and hemodynamic collapse ensued. She died after failed cardiopulmonary resuscitation. Chest computed tomography revealed aortic dissection, Stanford’s type A, or DeBakey’s type I (Fig. 3).

Discussion

Acute aortic dissection is the most catastrophic event involving the aorta, and is also one of the most life-threatening cardiovascular insults. Untreated acute aortic dissection has an estimated mortality rate from 1 to 2% per hour during the first 24 to 48 hours of onset. Therefore, prompt diagnosis is critical to prognostic impact. However, owing to its diverse clinical manifestations, acute aortic dissection is accurately and promptly diagnosed in only about 60% of cases.

Hagan et al reported that the typical patient with acute aortic dissection was male with a history of hypertension who presented with abrupt onset of chest pain. Aortic dissection is uncommon in young females. Certain predisposing factors, including...
connective tissue disease, congenital heart disease, pregnancy, trauma, and inflammatory disease are responsible for acute aortic dissection in this age group.\textsuperscript{3-5} Our patient had no obvious predisposing factors, except for pregnancy.

Despite its low incidence, the most common myocardial insult associated with acute aortic dissection is myocardial infarction, followed by giant cell arteritis, which has only been reported once.\textsuperscript{2,3} To the best of our knowledge, acute aortic dissection associated with myocarditis or peripartum cardiomyopathy, as seen in our patient, has not been reported. In fact, although pregnancy may have some impact on the development of aortic dissection, it is an uncommon occurrence during pregnancy.\textsuperscript{6-10} Myocarditis or peripartum cardiomyopathy occurs approximately once in every 2500 deliveries, comprising less than 1% of pregnancy-associated cardiovascular abnormalities.\textsuperscript{11} Therefore, the combination of both clinical conditions is extremely rare. In our patient, elevated serum levels of cardiac enzymes and C-reactive protein prompted us to attribute the pathogenesis of aortic dissection to cardiomyopathy with left ventricular dysfunction despite the fact that these markers could also be elevated in patients with acute aortic dissection.\textsuperscript{12} The combination of vague symptoms, ventricular dysfunction and elevated serum cardiac markers could lead physicians to make an initial diagnosis of myocardial failure instead of aortic dissection. Nevertheless, aortic dissection was finally suspected based on the finding of widening mediastinum on chest film, although the definitive diagnosis was delayed because of the atypical clinical manifestations. Some reports indicated that in patients who presented with only abnormal chest roentgenography and no typical dissecting pain or pulse differentials, the possibility of acute aortic dissection may range from 15 to 39%.\textsuperscript{2,3} Abnormal roentgenography findings may be a useful adjunctive tool to facilitate diagnosis of this condition. In addition, although transthoracic echocardiography was not performed in this case, it is an accurate, efficient and safer tool for making a rapid diagnosis for aortic dissection, especially in patients who are hemodynamically unstable, and are too critically ill to be removed from the bedside.\textsuperscript{13}

This report describes a case of acute aortic dissection associated with left ventricular dysfunction and non-specific clinical symptoms in a young, normotensive, and postpartum woman. A high index of clinical suspicion and alertness is needed for early diagnosis of this condition in such patient, especially in the presence of a widening mediastinum.

References