Takotsubo Cardiomyopathy Complicated by Cardiac Tamponade

Classic Hemodynamic Findings With a New Disease

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An 83-year-old woman with no significant medical history developed acute onset chest pain lasting for 1 hour. Electrocardiography performed by emergency responders showed transient 2-mm high-lateral ST elevations on electrocardiography (Figure 1), and she was brought to the emergency room. She was treated with unfractionated heparin (60-U/kg bolus followed by 12 U/kg/min infusion), the glycoprotein IIb/IIIa inhibitor eptifibatide (180-μg/kg bolus followed by 2-μg·kg⁻¹·min⁻¹ infusion), and 300 mg of clopidogrel by mouth. She developed severe hypotension that required high-dose parenteral inotropic support and was transferred to the catheterization laboratory for emergency cardiac catheterization. Coronary angiography revealed only minor atherosclerotic disease in a small diagonal branch; left ventriculography demonstrated akinesis of the entire mid to apical portions of the left ventricle, consistent with the “apical ballooning” syndrome, or takotsubo cardiomyopathy (Figure 2). Severe pulsus paradoxus (>40 mm Hg) was noted on aortic pressure tracings (Figure 3), and right-sided heart catheterization disclosed equalization of diastolic pressure throughout the cardiac chambers. Transthoracic echocardiography was performed on an emergency basis and revealed a small, noncircumferential pericardial effusion adjacent to the right ventricular free wall, with diastolic collapse of the right atrium consistent with pericardial tamponade (Figure 4). Pericardiocentesis was performed, which revealed identical intrapericardial and right atrial pressures that ranged from 20 to 50 mm Hg with profound respirophasic variation (Figure 5). The patient’s hemodynamic status improved abruptly with the removal of 75 to 100 mL of bloody pericardial fluid; thereafter, the drainage of fluid continued steadily at a slow rate (<5 mL per minute over the next hour), likely representing continued blood loss into the pericardial space. The patient was immediately weaned from pressors, and her clinical status improved; she was discharged on hospital day 10. A follow-up echocardiogram 2 weeks after discharge revealed total recovery of left ventricular function, with no persistent wall-motion abnormality and complete resolution of the pericardial effusion.

Discussion

Takotsubo cardiomyopathy is an increasingly commonly recognized disease characterized by the development of severe cardiac wall-motion abnormalities of the mid left ventricle and apex with relative sparing of the base in the absence of coronary artery disease. The disease is often associated with severe hemodynamic instability and predominantly afflicts postmenopausal women, often after physical

Figure 1. ECG performed by emergency responders demonstrating ST-segment elevations in leads I and aVL, with reciprocal ST changes in the inferior leads.
or emotional stress. Because takotsubo cardiomyopathy is often associated with chest pain and ECG changes indistinguishable from acute myocardial infarction, patients are often treated with antiplatelet and anticoagulant regimens and referred for emergency cardiac catheterization.

Recent studies using cardiac magnetic resonance imaging suggest that pericardial effusion is common in patients with takotsubo cardiomyopathy. In addition, animal experiments have shown that in the setting of a dilated left ventricle, only a small amount of pericardial fluid may be necessary to provoke hemodynamic instability, as was seen in our patient.

We believe this is the first report of takotsubo cardiomyopathy complicated by cardiac tamponade due to hemorrhagic pericardial effusion developed in the context of high-dose anticoagulation. Moreover, this case demonstrates the phenomenon of increased interventricular dependence in the setting of acute left ventricular dysfunction and dilation, with classic hemodynamic findings of cardiac tamponade caused by a modest amount of pericardial fluid. Greater attention to the roles of inflammation, pericardial effusion, and consequent hemorrhagic risk in takotsubo cardiomyopathy may be warranted.

Disclosures

None.

References

Figure 4. Transthoracic echocardiogram before pericardiocentesis showing dilation of the left ventricle, with evidence of only a small pericardial effusion seen only over the right ventricle (left arrow). The effusion was not seen in the parasternal long-axis view. There was evidence of right atrial diastolic collapse consistent with tamponade (right arrow).

Figure 5. Hemodynamic tracing showing elevated mean intrapericardial pressure of 33 mm Hg, with equalization with the right atrial pressure waveform. CVP indicates central venous pressure; HR, heart rate.
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