Case presentation: An 86-year-old female presented to our emergency department with chest pain and orthopnea and was diagnosed with heart failure and ST-elevation myocardial infarction, prompting hospitalization. During hospitalization, she developed a fever. A chest and abdominal contrast-enhanced computed tomography (CT), conducted to investigate the cause of the fever, coincidentally revealed sedimentation of contrast agent in the descending aorta. To differentiate from aortic dissection, we conducted dynamic CT, and it was confirmed that the contrast agent within the aorta decreased over time. On the same day, an echocardiogram revealed a left ventricular ejection fraction of 36% with reduced contractile function, and a stagnant, hazy echo within the descending aorta.

Discussion: In aortic dissection, the retention of contrast agent in the false lumen of the aorta is a crucial finding for diagnosis. However, we experienced a case where contrast agent accumulated in the descending aorta, caused by low ejection fraction of the left ventricle. Differential diagnosis from aortic dissection may be possible due to the gradual decrease in contrast agent over time. This case is valuable to report given the limited number of previous reports on this phenomenon. [Clin Pract Cases Emerg Med. XXXX;X(X):X–X.]

Keywords: heart failure; contrast agent pooling; aortic dissection.
was observed, suggesting a decrease in aortic flow velocity. To differentiate from aortic dissection, dynamic CT was performed. As the arterial, portal venous, and equilibrium phases were sequentially acquired, it was confirmed that the CA within the aorta decreased over time (Image).

On the same day as the CT, an echocardiogram was performed, revealing a left ventricular ejection fraction of 36% with reduced contractile function. Diffuse hypokinesis was noted, particularly with decreased wall motion in the inferolateral-inferior wall. There was dilation of the ascending aorta, and we observed moderate aortic and mitral valve regurgitation. No enlargement of the right heart chambers, thrombi, or vegetations were observed. The blood flow velocity in the descending aorta varied due to atrial fibrillation but was generally around 50-80 centimeters per second. Echography revealed a stagnant, hazy echo within the descending aorta.

DISCUSSION

Here we report CT images showing CA retention due to decreased aortic flow velocity in severe heart failure. In cases of cardiac arrest or cardiogenic shock, CA pooling in the venous system in CT images has been reported as “contrast agent pooling sign.”1,2 To our knowledge, there have been no reports of such findings of aortic involvement, particularly in those not requiring inotropic support or oxygen supplementation.

We concluded that the pooling of CA was due to low cardiac output syndrome, resulting from the reduced ejection fraction and regurgitation. The retention of CA in the aorta on CT, particularly in patients with heart failure, strongly suggests reduced cardiac output. Although aortic dissection is a critical differential diagnosis that could cause such findings on CT, the gradual change in CA pooling observed in dynamic CT can help differentiate between these two conditions.

CPC-EM Capsule
What do we already know about this clinical entity?
Contrast agent pooling is linked to cardiogenic shock or cardiopulmonary arrest, but its association with low-output heart failure has not been reported.

What is the major impact of the image(s)?
Our case shows dynamic CT can detect changes in contrast agent pooling, ruling out aortic dissection.

How might this improve emergency medicine practice?
Dynamic CT is essential for diagnosing and differentiating between aortic dissection and contrast agent pooling conditions such as low-output heart failure.
REFERENCES
