Case	(638) Pump failure in the table
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CASE PRESENTATION

A 51 y.o man with no previous known diseases was brought after two syncope of seconds of duration. He referred thoracic pain the previous 24 hours that calmed with conventional analgesia. He was tachypneic, showed mucocutaneous pallor and complained of transfixive chest pain. Blood pressure was 80/40 mmHg, heart rate 90 bpm, electrocardiogram and laboratory normal.

Thoracoabdominal computerized tomography (CT) was performed to rule out acute aortic pathology.

Hyperdense pericardial effusion associated to ascending aortic dilatation with a focal wall vessel irregularity was demonstrated. Also, substantial delay in vascular opacification after contrast material injection, reflux of contrast material in inferior vena cava, contrast pooling in the dependent liver parenchyma and abdominal veins, absence of visceral enhancement, central pulmonary "ground glass" opacities and peripancreatic edema were observed.

Findings suggested aortic rupture and cardiac tamponade with secondary cardiogenic shock.

During the venous post-contrast phase CT acquisition monitors warned and cardiopulmonary resuscitation was needed. Patient underwent emergent thoracothomy and ascending aorta aneurysm rupture was repaired.

DISCUSSION

Cardiac tamponade results from accumulation of fluid in the pericardial cavity. Intrapericardial pressure increases leading to insufficient cardiac compliance in diastole, with subsequent cardiac inflow limitation.

Stroke volume and blood pressure decrease, causing diminished cardiac ouput and cardiogenic shock. Severity of the shock depends directly on the velocity of accumulation of fluid in the pericardial cavity. In this case, the aortic rupture caused an extremely rapid hemopericardium and thus cardiogenic arrest in the exploration table.

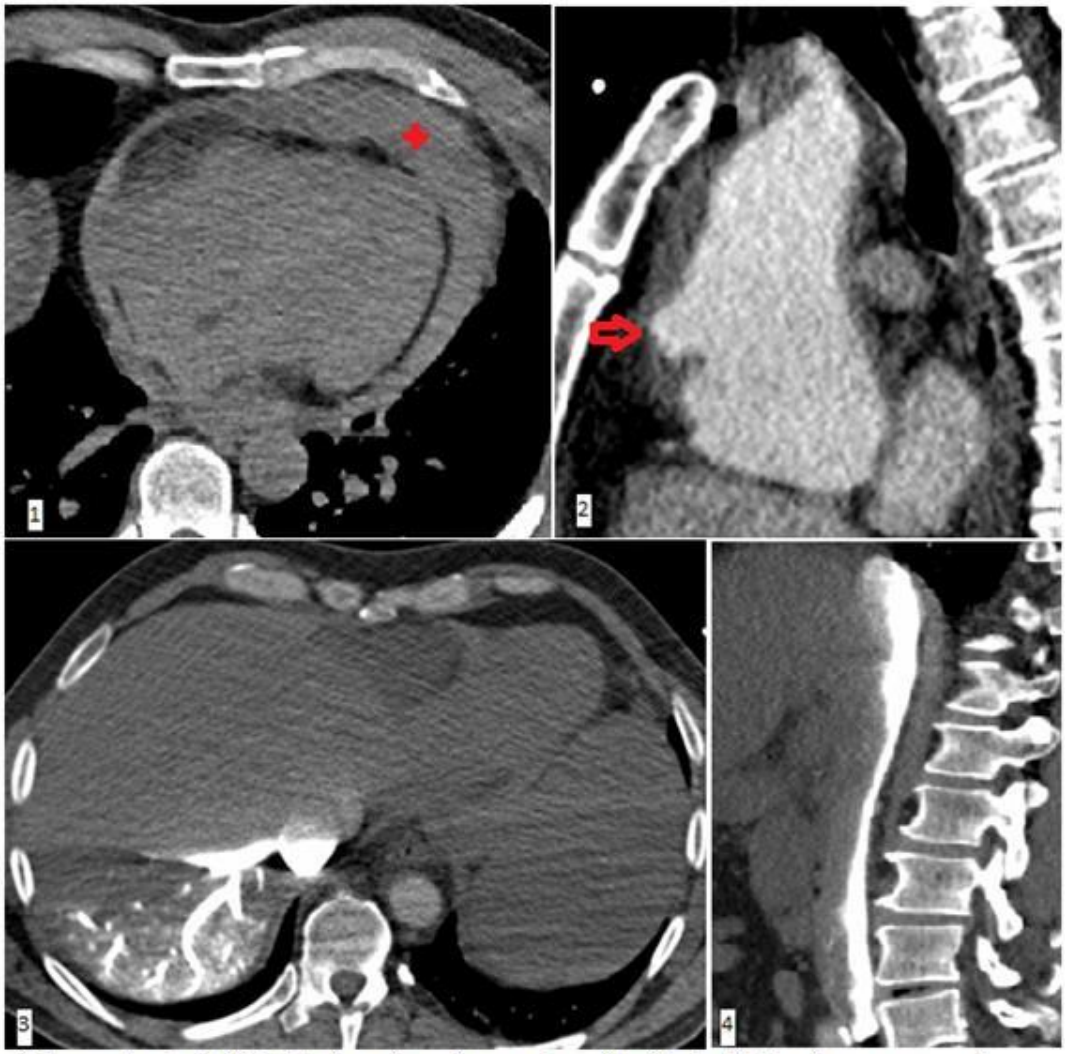
Echocardiography is the initial imaging tool for depicting pericardial effusion. When an extracardiac cause is suspected a chest CT must be performed to assess mediastinal vessels integrity and repercussion of the organs. Hemopericardium is seen as dense pericardial effusion in pre-contrast CT. Dilated ascending aorta with a focal irregularity (also called "bleb") in the angiographic phase suggest aortic rupture secondary to vessel wall injury.

Hemodynamic impairment due to pump failure in cardiogenic shock drives to blood stasis. This causes gravity-dependent contrast material pooling and layering in the veins. As the organs blood supply is limited, they don't enhance after contrast.

Systemic hemodynamic alteration causes generalized edema seen as opacities in the lungs or abdominal fat stranding.

CONCLUSION

CT angiography is the elective technique when extracardiac cause for pericardial effusion suspected. Emergency radiologists must be familiar with indirect signs of cardiac pump failure as it indicates the need of emergent cardiovascular surgery.



1. Non contrast axial CT slide shows hyperdense pericardial effusion that traduces presence of hemopericardium (red cross)
2. Parasagital CT aortogram depicts fusiform dilatation of the ascending aorta with a focal irregularity in the anterior wall or "bleb" (red arrow) that indicates the point of rupture. It's remarkable that automatic bollus tracking for arterial phase acquisition (set at 100HU in the aortic arch) shot the scan 55 seconds after the injection of contrast material, what implies an important delay in the contrast material progression
3. axial and 4. sagital post-contrast CT shows pooling and layering of the contrast medium in the dependent portion of liver parenchyma, of the hepatic veins and inferior cava vein

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