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CASE IN POINT

Ascending aorta thrombosis combined with pulmonary artery thrombosis: a case report

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Abstract

Ascending aorta thrombosis is very rare, and the exact mechanism of thrombosis in the context of high-speed blood flow is not fully understood. Pulmonary artery thrombosis is also a potentially life-threatening disease. Here we are reporting a case of ascending aorta thrombosis combined with pulmonary artery thrombosis.

Keywords Ascending aorta · Pulmonary artery · Arterial thrombosis

A 49-year-old man presented with the chief complaints of chest tightness and shortness of breath for 2 weeks which had aggravated for 2 days prior to the presentation and was admitted. He had a history of smoking and drinking for more than 30 years. He was subjected to computed tomography (CT) scan which revealed the presence of low-attenuation shadows in the ascending aorta and pulmonary trunk lumen. Auxiliary examination: PH 7.44; PaO_2 44 mmHg; HCO_3^- 28.5 mmol/L; BNP 659.8 pg/ml; D-D 3.54 ug/ml; FDP 11.10 ug/ml; ECG: V1–V3 lead T wave inversion. CT angiography (CTA) established the presence of pulmonary artery trunk and partial branches embolization combined with ascending aortic thrombosis (Fig. 1a). Cardiac magnetic resonance imaging (CMR) revealed the presence of many abnormal signal shadows in the ascending aorta and main trunk and branches of the left pulmonary artery, which were hypointense on T1-weighted image (T1WI) and T2-weighted image (T2WI). DWI dispersion was not limited. No obvious enhancement was found on contrast-enhanced and delayed-enhancement scan (Fig. 1b, c). Echocardiography showed hypoecho in the left pulmonary artery (Fig. 1d). Ultrasonography of lower extremity vessels didn't show any obvious abnormality in the arteries and veins. The patient was initially managed with oxygen and anticoagulation therapy. After the completion of every inspection, "aorta space-occupying removal + ascending aorta replacement + partial aortic arch replacement + left pulmonary thrombosis removal + pericardial open window drainage" was performed in the patient with a successful outcome.

Postoperative pathological diagnosis showed (Fig. 1d, f): (1) The ascending aorta conformed to atherosclerotic plaque thrombosis with local thrombus organization; (2) The left pulmonary artery conformed to the pathological changes of thrombosis.

Ascending aorta thrombosis is a rare event, according to the literature, intra-aortic thrombosis is associated with an aneurysm, aortic dissection, trauma, or severe atherosclerotic plaque [1]. Disrupted or eroded atherosclerotic plaques which act as a substrate for thrombosis may result in ascending aortic thrombosis. In this patient, the ascending aortic thrombosis was formed on the basis of atherosclerotic plaques. Its imaging findings are similar to pulmonary thrombosis. CTA and magnetic resonance imaging (MRI) manifest as filling defects in the lumen. Long-term anticoagulation therapy may lead to thrombosis rupture. Therefore, surgical treatment should be considered before a serious embolism event occurs [2].

Pulmonary artery thrombosis is a potentially life-threatening disease. Its clinical symptoms are similar to that of pulmonary embolism, which may be manifested as chest pain, respiratory difficulty, and rare hemoptysis. Thrombosis is mainly related to vascular factors, blood viscosity and blood composition [3]. Age, obesity and smoking are important risk factors [4]. The patient had a history of drinking

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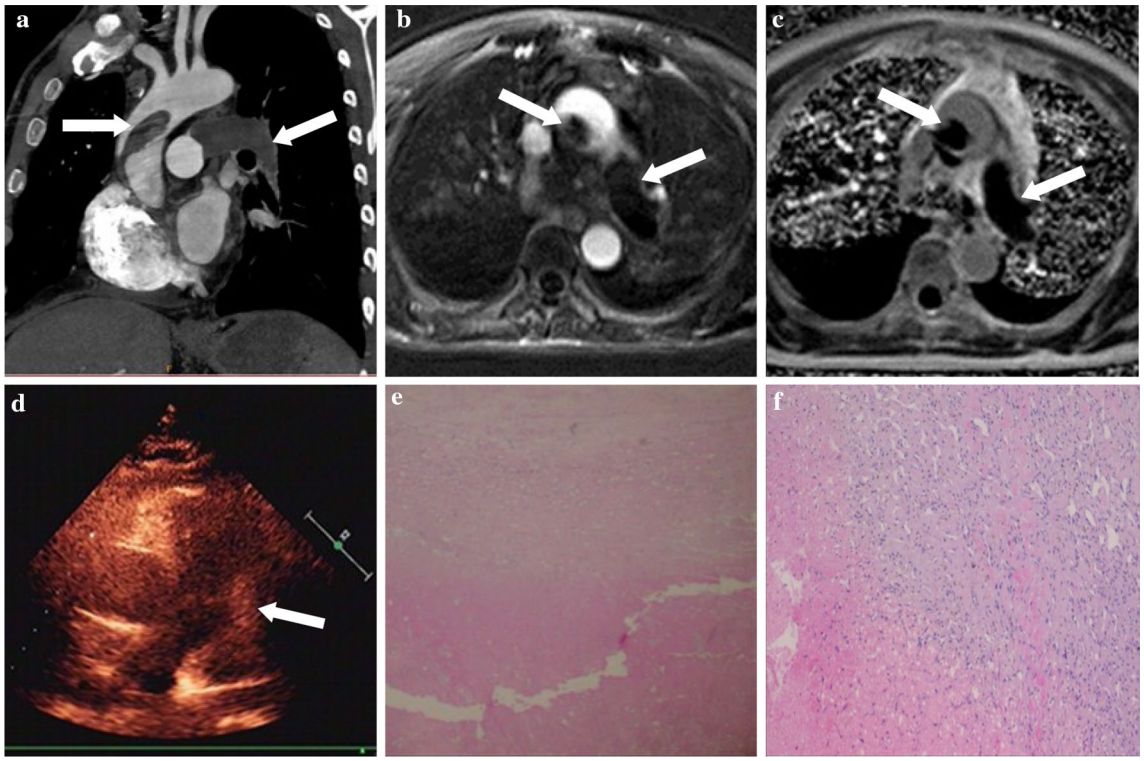

Fig. 1 **a** Re-formatted multiple planar reformation image showing pulmonary artery trunk and partial branches embolization combined with ascending aortic thrombosis (white arrows). **b** On contrast-enhanced CMR scan showing no obvious enhancement (white arrows). **c** On delayed-enhancement CMR scan, there is no obvious enhancement (white arrows). **d** Echocardiography showing hypoecho in the left pulmonary artery (white arrow). **e** The ascending aorta conformed to atherosclerotic plaque thrombosis. **f** The left pulmonary artery conformed to the thrombosis

and smoking, and his blood was in a state of hypercoagulation, but the ultrasound of the blood vessels in the lower extremities showed no thrombosis. Therefore, we exclude the exogenous thrombosis and consider it as PTA. In CT pulmonary angiography, it presents as filling defects in the pulmonary artery, reduced pulmonary blood and decreased pulmonary perfusion. MRI also presents as filling defects in the lumen. On contrast-enhanced scan, the thrombus was not enhanced.

This case should be distinguished from primary arterial endometrial sarcoma (IS). IS is a rare malignant tumor which is difficult to be diagnosed preoperatively. The imaging manifestations of IS are nonspecific. CT plain scan shows low-attenuation filling defects in the arterial lumen. Enhanced CT shows obvious enhancement, accompanied by expansion of the involved arteries or extraventricular tumor extension [5]. CTA shows patchy delayed enhancement, more evident in the venous phase. MRI shows isointense or slightly hyperintense on T1WI and T2WI. Differentiation of IS from thromboembolism depends on pathology and immunohistochemistry.

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Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interest.

Informed consent Written consent was obtained from our patient for publication of this case report and any accompanying images.

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