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Acute aortic dissection with right-sided chest and back pain accompanied by left-sided limb dyskinesia

We retrospectively studied the diagnosis and treatment of a case of AAD misdiagnosed as stroke since atypical symptoms as the first manifestation, and discussed the clinical features and manifestations, diagnosis, and differential diagnosis of the case in the context of relevant domestic and international literature. The patient, a 49-year-old male with herpes zoster for more than 1 month, presented with sudden onset of right-sided chest and back pain, accompanied by numbness and weakness of the left limb, and was tentatively diagnosed with post-herpetic neuralgia combined with stroke due to the history of herpes zoster. Non-specific ST-T alterations, D-dimer 20ug/ml, and non-traumatic angiographic findings in the transthoracic and abdominal aorta demonstrated slight thickening of the patient's ascending aorta, and the lumen of the root sinus region showed intimal flap formation with a larger pseudocoel and smaller true lumen, which ultimately confirmed the diagnosis of acute aortic coarctation with atypical presentation. So clinicians need to improve their basic theoretical knowledge, strengthen the understanding of AAD, focus on physical examination, improve relevant auxiliary examinations expeditiously, and pay attention to the significance of specific auxiliary examinations in order to decrease misdiagnosis and missed diagnosis of atypical manifestations of AAD patients.

Keywords Acute aortic dissection; acute myocardial infarction; herpes zoster; atypical symptoms

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Introduction

Acute aortic dissection (AAD) is a devastating aortic disease that is an extremely critical cardiovascular emergency, which can be life-threatening [1]. During recent years, the clinical incidence of AAD has been increasing, and its incidence is higher in men than in women [2]. A small number of patients have atypical clinical manifestations, and these are easily misdiagnosed and may lead to death due to delayed, correct diagnosis and treatment. Here we report a case of aortic dissection with atypical clinical manifestations.

Clinical Data

Brief Description of the Case

The male patient was a 49-yr-old farmer. Past medical history: Hypertension, unclear medication history, and unknown blood pressure control; a 1-mo-history of herpes zoster. Patient denied history of smoking or alcohol consumption. Complaint: Patient was admitted to the emergency service at 07:21 a.m. on July 12, 2020, with right-sided chest and back pain, together with left-sided limb immobility of 5-hr-duration. No previous history of similar illnesses was reported. Upon rising at 5:00 a.m., the patient had suddenly developed right-sided chest and back pain, combined with numbness and weakness of the left limbs, difficulty standing and walking, and occasional dizziness. There was no difficulty in swallowing or other symptoms, such as syncope, radiating pain elsewhere, profuse sweating, nausea, vomiting, or urinary and fecal incontinence.

Examination Results

The patient presented to our emergency centerat 07:21 a.m. on the same day. Electrocardiographic (ECG) examination showed sinus rhythm with nonspecific ST-segment and T wave (ST-T) changes. Laboratory tests: D-dimer, 20 μg/ml; fibrinogen equivalent unit (FEU), 0–0.5 μg/ml; troponin-T, 0.005 ng/ml (0–0.014 ng/ml); ischemic modified protein, 82 U/ml (0–77.6 U/ml). Routine blood values and coagulation function did not show apparent abnormalities. Imaging examination: angiography displayed no distinct abnormalities in the cranial computed tomography (CT) scan, which was consistent with cerebral arteriosclerosis and localized calcification in the wall of the cavernous sinus segment of the bilateral internal carotid artery Physical examination: Body temperature, 36.3°; heart rate, 78/min, rhythmical; strong heart sounds, no murmurs; respiration, 15/min; blood pressure, 91/36 mmHg; weight 75 kg; clear consciousness; poor mental health; bilateral nasolabial fold symmetry; bilateral pupils equal in size and round; existing light reflex; clear breath sounds in both lungs, no rales; skin herpes on the right thoracic back and posterior back; right upper abdominal pressure pain, no rebound pain; no abdominal muscle tension; muscle strength of the limbs, –

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5 grade; bilateral muscle tone, moderate; bilateral baroreflex sign, negative; meningeal stimulation sign, negative.

Diagnosis and treatment

Preliminary emergency diagnosis: stroke pending, post-herpetic neuralgia, hypotension. AMI could not be excluded. Initially treated as stroke and hypotension. Hypotension was gradually corrected. At 08:40 a.m., results of cardiac ultrasound indicated: 1) Aortic dissection (DeBakey type I); 2) Valvular degeneration; 3) Mitral regurgitation (mild); 4) Aortic regurgitation (severe). Medication for stroke was discontinued. Considering the patient's critical condition and risk of immediate respiratory and cardiac arrest, emergency surgery was recommended, as well as computed tomography angiography (CTA) of the thoracoabdominal aorta and the coronary artery.

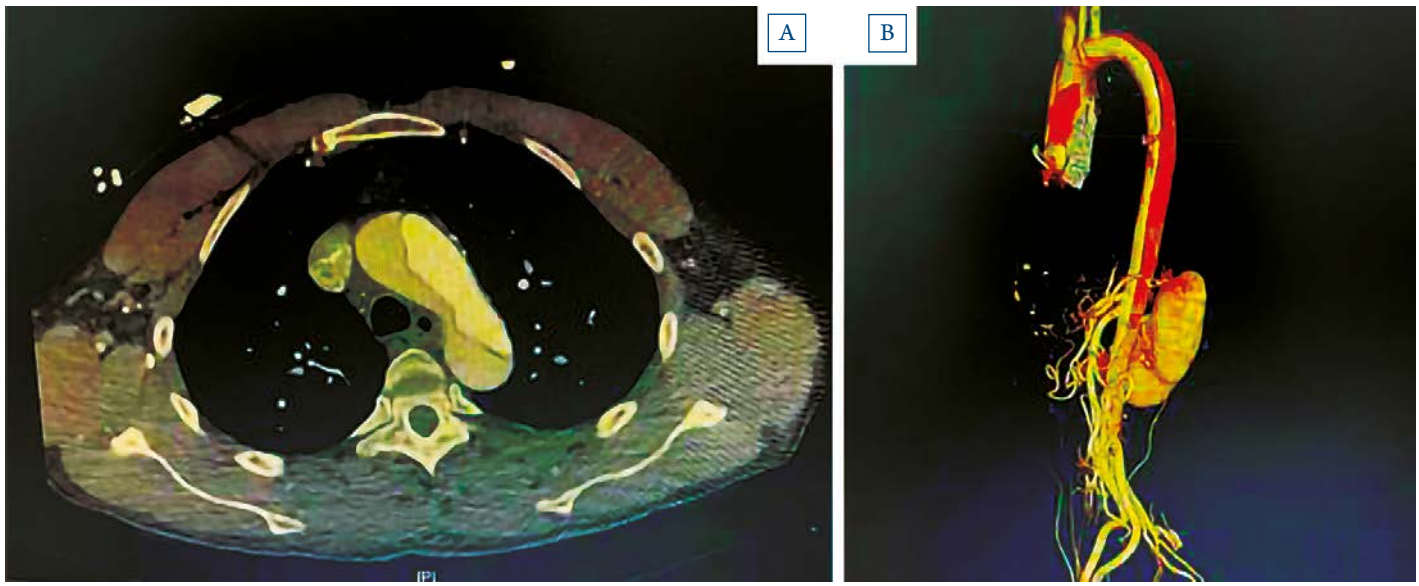
At 09:30 a.m., the CTA of the thoracoabdominal aorta and coronary artery revealed: 1) DeBakey type I aortic dissection with right cephalic-arm trunk involvement. The ascending aorta was slightly thickened, and the lumen of the ascending aorta root sinus region showed formation of an intimal flap with a visible entrance, a larger pseudocoel with a lower density, and a smaller true lumen with a higher density; the right and left coronary arteries were not involved; the aforementioned torn intima continued to the lower end of the abdominal aorta. Inward displacement of intimal could also be seen in the right cephalothoracic trunk lumen; 2) Aortic atherosclerosis; 3) Possible left renal artery embolism; 4) Limited emphysema in the upper lobes of both lungs; 5) Multiple hypodense hepatic shadows, possible hepatic cyst; 6) Bilateral hypointense shadow in the adrenal region; 7) Multiple calcified plaques in the proximal and middle segments of the left anterior descending coronary branch, with no evident luminal stenosis. See Figure 1.

The patient was transferred from the emergency department to the cardiac surgery department at 10:37 a.m. on July 12. We recommend immediate surgical treatment. From 12:30 p.m. to 8:47 p.m. on July 13, the patient underwent aortic valve replacement and ascending aortic replacement with coronary artery grafting (Bentall procedure) under general anesthesia. Postoperatively, the patient suffered from persistent bleeding and underwent open-heart hemostasis under general anesthesia from 00:00 a.m. to 02:30 a.m. on July 14. Con tinuous treatments were given, including cardiac monitoring, ventilator-assisted breathing, transfusion of concentrated red blood cells, anti-infection, etc. Biochemical examination exhibited hepatic and renal insufficiency, which was treated with liver preservation. On July 15, the patient's family requested that the patient be discharged from the hospital. Discharge diagnosis: 1) Aortic dissection type A; 2) Hepatic insufficiency; 3) Renal insufficiency; 4) Hypertension. Discharge instruction: Continued inpatient treatment was recommended. The patient died 2 days after discharge.

Discussion

Pape and Awais et al. [3] analyzed data from 4 428 patients in 28 international aortic dissection registries and found that the postoperative mortality rate was 18% for Acute type A aortic dissection (ATAAD). A retrospective study of Zhu et al. [4] of patients treated at Stanford University over 50 yrs showed that the 30-day and 1-year mortality rates for contemporary ATAAD patients were 9.4% and 11.8%, respectively. Postoperative complication of stroke is common in ATAAD [5]. The present case was ATAAD, and death within a week may have been due to complications, such as stroke, acute heart failure, and multiple organ failure, i.e., failure of liver or kidney function, and to improper care.

Figure 1. CTA imaging of the thoracic and abdominal aorta



The main symptom in most AAD patients is an acute attack of chest pain, which is mostly knife-like, needle-like, or tearing, usually persistent and unbearable, and poorly treated with opioids, such as morphine. Some patients may experience shock-like symptoms, such as pallor, sweating, cold skin on the extremities, and poor perfusion. Although there are typical incidences of severe chest pain, hypotension, and syncope, there are often atypical manifestations [2], such as the presence of neurological and digestive system symptoms. Thus, the differential diagnosis is quite difficult, and AAD is likely to be misdiagnosed as AMI [6].

In the present case, the patient was a middle-aged male with an atypical clinical presentation, a previous history of hypertension, and a 1-mo-history of herpes zoster. In addition, there was acute morning right-sided chest and back pain, and left-sided limb immobility, as the main manifestations. From the perspective of common and multiple diseases, it is often thought of clinically that the following five diseases should be considered as a priority: 1) AMI. This disease could be highly suspected due to the patient's violent and persistent chest and back pain, his previous history of hypertension, stable and normal early troponin-T, and an ECG suggesting ST-T changes [7]. However, patients with AMI present with prodromal symptoms before the onset, but have no left-sided limb immobility, so AMI could have been precluded. 2) Acute pulmonary embolism. This is mainly manifested by respiratory signs, such as dyspnea and shortness of breath, accompanied by chest pain and hemoptysis [8]. In this case, there was chest pain but no obvious dyspnea. Therefore, this evidence did not support acute pulmonary embolism. 3) Stroke. This patient had left-sided limb immobility and difficulty walking, similar to an acute stroke, but no manifestations of impaired consciousness or cognitive dysfunction were displayed. The examination was negative for meningeal stimulation signs and no abnormalities were seen on the cranial CT. Thus, the stroke hypothesis could have been excluded. 4) Post-herpetic neuralgia. These patients have a variety of clinical manifestations and may also suffer from persistent and intense chest and back pain [9]. The patient, in this case, had a 1-mo-history of herpes zoster 1, and the examination revealed skin herpes on the right side of the chest and back. Nevertheless, the other clinical manifestations of the patient could not have been be explained post-herpetic neuralgia. 5) Acute abdomen. This condition is evident from abdominal pain that can radiate to the chest and back and is usually accompanied by nausea and vomiting, features which are not consistent with the clinical findings in this case.

Physicians should consider the possibility of AAD or aortic aneurysm after excluding the above listed common diseases. The significantly elevated serum D-dimer in the present case implied a great possibility of AAD [10].

Conclusion

AAD is an acute and critical cardiovascular disease with high lethality and likely misdiagnosis. Clinicians should avoid inertia thinking and focus on D-dimer levels, early cardiac ultrasound implications, and thoracoabdominal aortic CTA imaging as significant information for the differential diagnosis.

No conflict of interest is reported.

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