

Case Report

Unexpected cause of a right hemiplegia secondary to the painless full-length aortic dissection: a case report and literature review

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Abstract: Painless aortic dissections in general are uncommon and are frequently misdiagnosed. Here we reported a rare case of acute ischemic stroke secondary to completely painless acute full-length dissection (DeBakey I) and provide a brief review of the literature. A 56-year-old man was referred to our department with right hemiplegia. Ischaemic stroke and thrombolytic treatment were considered initially. At the second examination, the patient was found to have decreased blood pressure, asymmetrical blood pressure/pulses between the bilateral limbs, and sudden loss of pulse in a lower extremity. Laboratory results revealed leucocytosis, elevated creatinine and CK without obvious cause. An aortic dissection was subsequently confirmed by contrast enhanced thoracic and abdominal CT scan. Our report provides some clues for the early diagnosis of painless aortic dissections.

Keywords: Completely painless acute aortic dissection, ischemic stroke, blood pressure, asymmetrical pulses

Introduction

Painless aortic dissections are uncommon and are frequently misdiagnosed, especially for those patients with atypical symptoms [1]. Case with full-length dissection (DeBakey I) is known to be very rare. Here, we describe a painless full-length aortic dissection presenting with acute ischemic stroke and discuss the implications of early diagnosis.

Case presentation

The Ethics Committee of Gongli Hospital, Pudong New Area, Shanghai approved our study. The reference number is 20131231.

A 56-year-old man presented to the Emergency Department because of sudden onset of right limb weakness and sense of heavy numbness in right leg for 3 hours. He had history of hypertension and an ischemic stroke leaving him with left-sided hemiparesis. On arrival, his left arm blood pressure was 120/70 mmHg, heart rate 87 beats per minute, respiration 20 times per minute and oxygen saturation 96%. He was conscious and alert. He denied chest or abdom-

inal pain. A neurologic examination disclosed a slightly right central type facial palsy and a right hemiplegia. The muscle force of his right arm and leg were 3/5 and 2/5 respectively. Aside from an old low density lesion in the right basilar part of pons and an old small low density lesion in corona radiata, head CT did not show any new infarction or hemorrhage. Laboratory results revealed elevated white blood cells count ($15.0 \times 10^9/L$; $4.0-10.0 \times 10^9/L$), NE (Neutrophil Count) (87%; 50-70%), CK (906 U/L; 25-170 U/L), creatinine ($105 \mu\text{mol/L}$; $42-97 \mu\text{mol/L}$). The prothrombin time and international normalized ratio were normal. Ischaemic stroke was considered initially and the patient was admitted to our stroke center for thrombolytic treatment. At the second examination, the pulse strength of his right radial artery, femoral artery and dorsal artery of foot was all marked weaker than that of the left-side. His blood pressure was 80/50 mmHg in the right arm and 115/70 mmHg in the left arm. Ten minutes after admission, his neurological symptoms improved and the muscle force of his right arm and leg were 5/5 and 3/5 respectively. Aortic dissection was suspected and he was proceed-

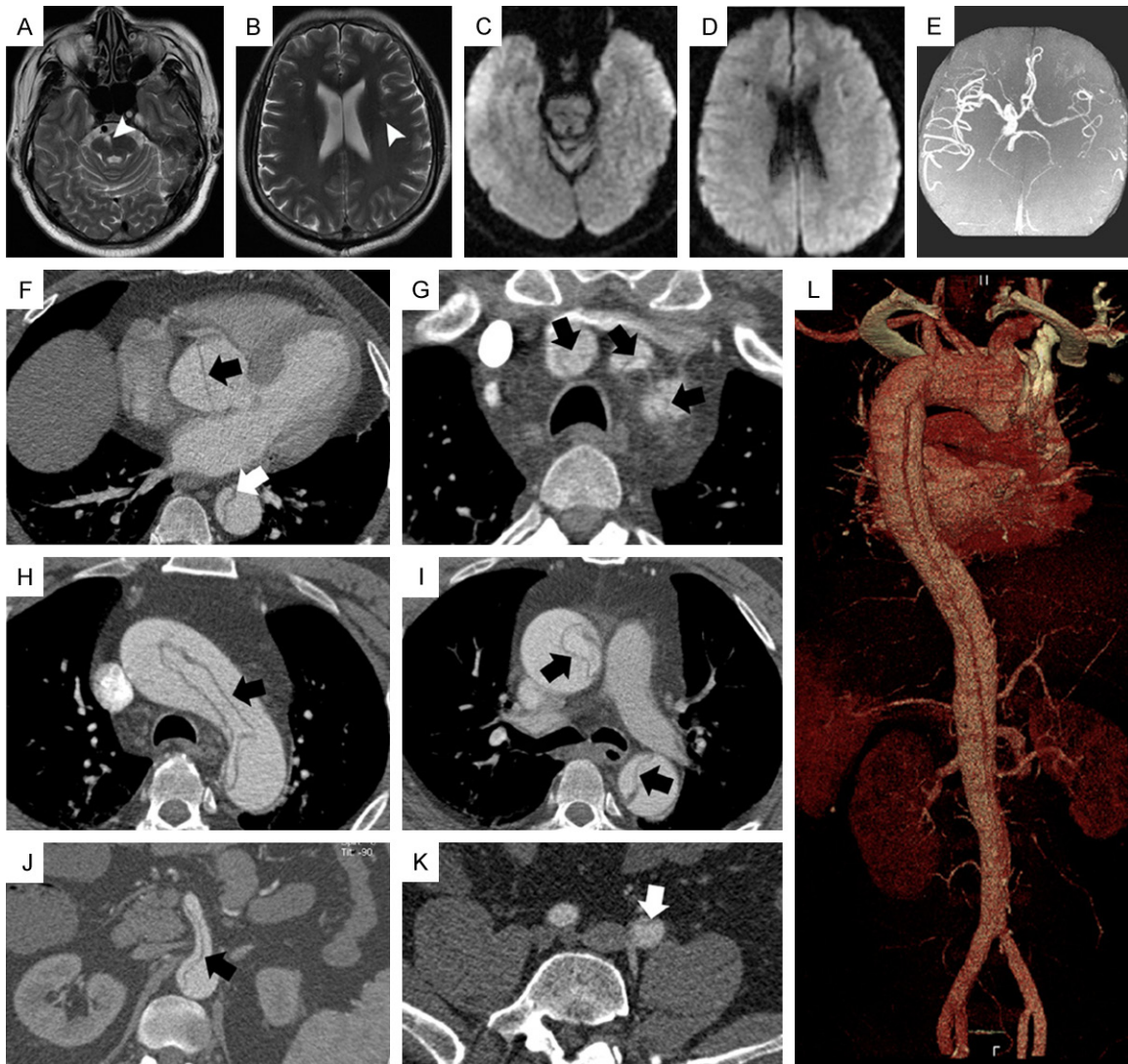


Figure 1. A painless full-length aortic dissection presenting with acute ischemic stroke. T2-weighted MRI images demonstrate a bright signal lesion (white arrowhead) in the right basilar part of pons (A) and a small slightly high signal lesion (white arrowhead) in corona radiata (B), MRI-DWI shows no new lesions in the corresponding regions (C, D), MRA displays non visualization of the left internal carotid artery and middle cerebral artery (MCA) and its branches become slender (E). Contrast enhanced thoracic and abdominal CT scans reveal dissection within the root of the ascending aorta (black arrow) (F), with supra-aortic branches (black arrow) (G), aortic arch (black arrow) (H), thoracic ascending and descending aorta (I), superior mesenteric artery (black arrow) (J) and abdominal aorta up to left common iliac artery (white arrow) (K). Three-dimensional volume rendering view illustrating the extent of aortic dissection (L).

ed to arrange with magnetic resonance imaging (MRI). Diffusion-weighted MRI (DWI) didn't find any new lesion (**Figure 1C, 1D**). Magnetic resonance angiography (MRA) showed non visualization of the left internal carotid artery and middle cerebral artery (MCA) and its branches became slender (**Figure 1E**). Contrast enhanced thoracic and abdominal CT was then performed and the results showed full-length dissection, which extended from the root of the ascending

aorta to the left common iliac artery, involvement of the three arch branch vessels (**Figure 1F-L**). After the diagnosis of a life-threatening aortic dissection (De-Bakey I) was made, the thrombolytic treatment was withheld and the patient was kept in hypotension and immediately transferred to Cardiac Surgery for the aortic repair. However, his family refused to allow an operation. Unfortunately, he died of multiple organ failure at the 72 hour after presentation

of his first symptoms in spite of all resuscitative efforts.

Discussion

Aortic dissection can produce a wide range of symptoms by affecting the outflow of supra-aortal, abdominal, spinal, extremity, and renal vessels. Typical symptoms are severe chest, back or abdominal pain [2]. However, around 6.4% of acute aortic dissections are painless. Several explanations have been proposed for aortic dissection occurring without pain, including that gradual dissection with less wall stretching reduces the stimulation of pain receptors [3]. Others have suggested that sparing of the adventitial layer, the site of aortic innervation, in aortic dissection may eliminate pain [3, 4].

Neurologic deficits have been associated with 18% to 30% cases of aortic dissection. Cerebral ischemia/stroke is the most common neurologic manifestation associated with aortic dissection and has been reported to affect 5% to 10% of patients [5]. Acute stroke [6-8] or transient ischemic attack [9, 10] may develop when the aortic dissection extends to the innominate artery, common carotid arteries or/and left subclavian artery, as it occurred in our case. Since the right carotid artery is involved in many cases, left hemiplegia is more common. But our patient presented with a right hemiplegia, though all the three arch branch vessels were involved. Occasionally, some other clinical manifestations, such as syncope [11], and transient global amnesia [12] may also be presented due to the transient cerebral hypoperfusion secondary to the aortic dissection.

Once the patient is diagnosed as having ischemic stroke, thrombolytic, antiplatelet or anticoagulant therapy may be started before the true cause of the stroke is determined. Our patient presented with acute stroke within the 4.5-hour time window and was initially considered to be a suitable candidate for thrombolytic treatment. But some signs observed at second examination led us to the consideration of aortic dissection.

Acute stroke patients usually have increased blood pressure in the acute stage, but our patient blood pressure (left) was not high on arrival, despite a long history of hypertension.

So we performed a second examination and found that the patient had further decreased blood pressure, asymmetrical blood pressure/pulses between the bilateral upper extremities. Evidence showed asymmetric pulses (20% to 30%) [13] and varying blood pressures between different upper limbs are strong indicators of possible aortic dissection. Other possible condition included coarctation aorta involving aortic arch, inflammatory aortitis as syphilitic aortitis, aortic arch syndrome, supraaortic stenosis, and subclavian steal syndrome [14, 15]. Given the history of a long hypertension and an ischemic stroke, the subclavian artery atherosclerosis and stenosis should be considered. This obscured the diagnosis of aortic dissection.

We also noticed that the pulse strength of his right femoral artery and dorsal artery of foot was both marked weaker than that of the left-side. Clinicians should consider the possibility of aortic dissection in patients presenting with sudden loss of pulse in a lower extremity, because aortic dissection may also result in symptomatic ischemia, which most commonly occurs in a lower extremity [16].

Apart from neurologic deficits, acute renal failure (13.6%), myocardial infarction (7.1%), and mesenteric ischaemia or infarction (6.8%) have been reported in painless dissection [6, 17], as it occurred in our case. So when patients present with and/or develop signs and symptoms of ischaemic injury effecting multiple organs without obvious cause, aortic dissection should be considered, even without the presence of characteristic pain [6].

In summary, our report strengthens the idea that acute stroke patient with decreased blood pressure, asymmetrical bilateral pulses/blood pressures, sudden loss of pulse in a lower extremity and multiple organs failure without obvious cause should be exclude the possibility of painless aortic dissection, especially before thrombolytic treatment. Our report provides some clues for the early diagnosis of painless aortic dissections.

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Disclosure of conflict of interest

None.

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