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Case report

Atrial fibrillation and stroke as initial manifestations of painless type A aortic dissection

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ABSTRACT

Aortic dissection is diagnostically challenging, especially in pain-free patients. Detection of acute ischemic stroke secondary to painless aortic dissection is a challenge for emergency physicians and neurologists. We report a previously healthy 58-years old female, admitted because of nausea, dizziness, somnolence, a left-sided hemiparesis and arterial hypotension. The electrocardiogram showed atrial fibrillation with ST-elevations and ST-depressions. Perfusion CT-imaging showed a dilatation of the aortic arch and intraluminal structures indicating an intima flap of aortic dissection. Four hours after onset of symptoms the patient died on the way to the cardiac surgery.

In conclusion, apart from imaging the aortic arch by computed tomography in acute stroke patients, the electrocardiogram may be indicative for aortic dissection if it shows signs for myocardial ischemia in previously healthy patients.

1. Introduction

Aortic dissection manifests usually as a painful event with sudden onset. However, in up to 6% of cases, aortic dissection occurs without pain [1–3]. Early detection of acute ischemic stroke secondary to painless aortic dissection is a challenge for emergency physicians and neurologists, especially when under the stress of the 3-h golden time window for thrombolytic therapy [4]. The situation becomes even more confusing when painless aortic dissection manifests with stroke and new onset of atrial fibrillation, as in the reported patient.

2. Case report

A 58-years old Caucasian female was admitted because of sudden onset of nausea, dizziness, somnolence and a left-sided hemiparesis. She had no history of cardiovascular diseases and did not take any medication. She did not complain about any pain. She was hypotensive with a blood-pressure of 70/40 mm Hg. The electrocardiogram showed tachycardiac atrial fibrillation with a ventricular rate of 139/min, ST-elevations in leads aVR and aVL and ST-depressions in leads II, III aVF, V_3–V_6 indicating ischemia (Fig. 1). On clinical neurological examination, the patient was

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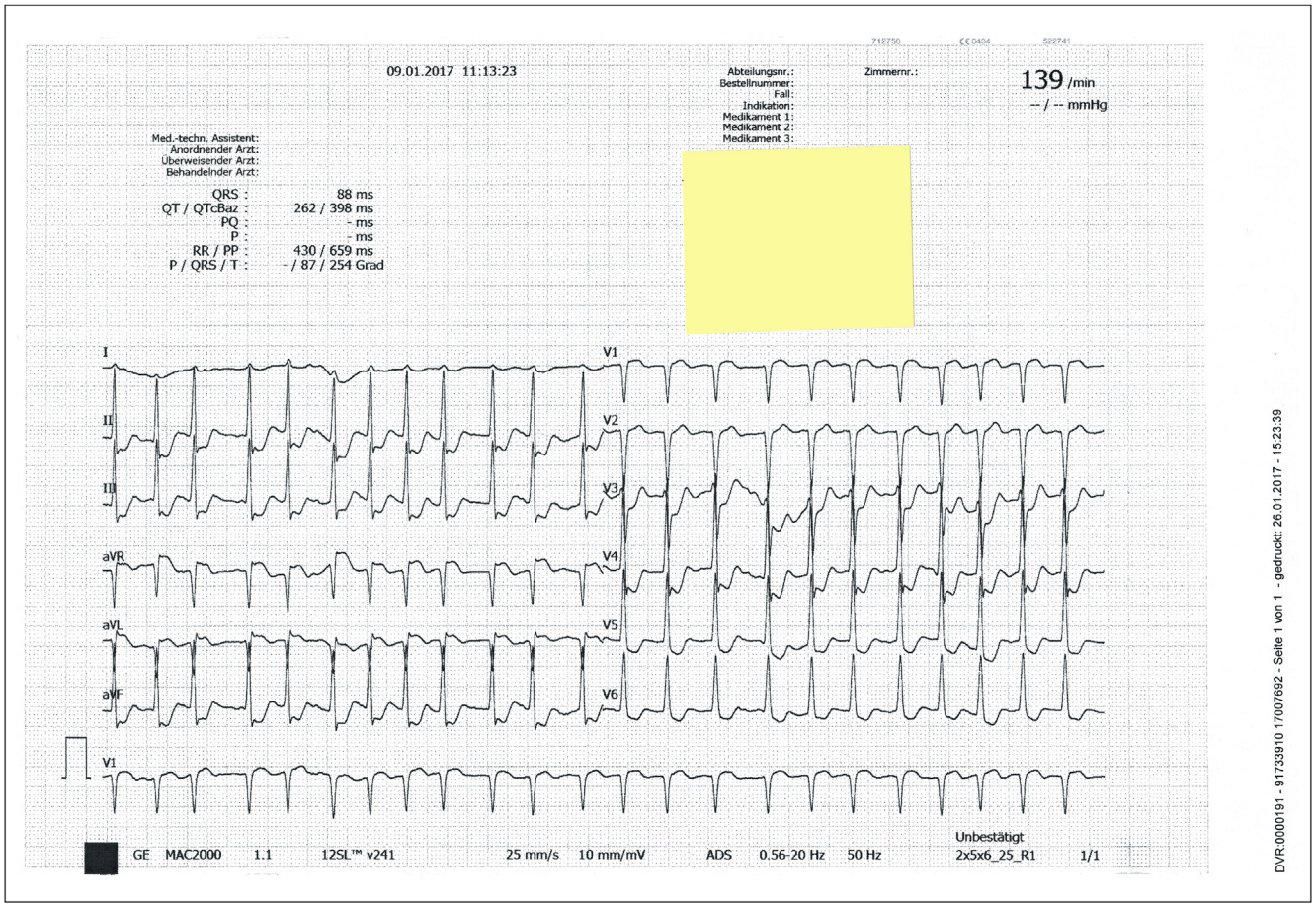

Fig. 1 – Electrocardiogram showing atrial fibrillation with a ventricular rate of 139/min, ST-elevations in leads aVR and aVL and ST-depressions in leads II, III aVF, V_3–V_6.

awake and completed adequately all tasks. She showed a fixed gaze palsy to the right, was slightly dysarthric, and had a moderate left-sided hemiparesis (M3 to M4). After administration of parenteral fluid, the systolic blood pressure increased to 100 mmHg. A cerebral magnetic resonance investigation for suspected stroke had to be interrupted because of discomfort, unsteadiness, and fear. Computed tomography showed no signs of territorial ischemia or bleeding. Perfusion CT-imaging showed a slight dilatation of the aortic arch, slight contrast enhancement within the aortic arch and intraluminal structures, indicating an intima flap of aortic dissection (Fig. 2a). The right hemisphere was hypoperfused with contrast medium and an intima flap was present in the brachiocephalic trunk (Fig. 2b). During the investigation, the hemodynamic situation deteriorated again, the patient became comatose, and she had to be resuscitated. After intubation and successful resuscitation, she was transferred for acute cardiac surgery. Upon arrival, she had to be resuscitated again and died 4 h after the onset of the symptoms.

3. Discussion

Aortic dissection demonstrates a wide range of symptoms by affecting the outflow of the supraaortal, abdominal, spinal, renal, and extremity vessels. Typical symptoms are severe pain of the chest, radiating into the back or abdominal region. However, around 6% of acute aortic dissections are painless [1–3].

Several explanations have been proposed for the phenomenon of aortic dissection occurring without pain. One explanation postulated that gradual dissection with less wall stretching reduces the stimulation of pain receptors [5]. Others have suggested that sparing of the adventitial layer, the site of aortic innervation, in aortic dissection may eliminate pain [6]. Patients with painless aortic dissection are reported to have a higher proportion of Stanford type A type dissection, a higher incidence of unconsciousness and hypotension than patients with aortic dissection and pain [2]. By computed tomography angiography, the incidence of involvement of the aortic arch in the painless group was higher than that in the pain group [2]. Also in our patient, the aortic arch and the supraaortic vessels were involved.

Little is known about electrocardiographic abnormalities in patients with painless aortic dissection. Arrhythmias, so far described in painless aortic dissection, comprise sinus tachycardia [7], ventricular ectopic beats [8], 3rd degree atrioventricular block [9], and atrial fibrillation [10]. New onset of atrial fibrillation in acute aortic dissection is a rare phenomenon. So far, it has been reported in 4 cases, all with acute pain and may be due to left atrial compression by the

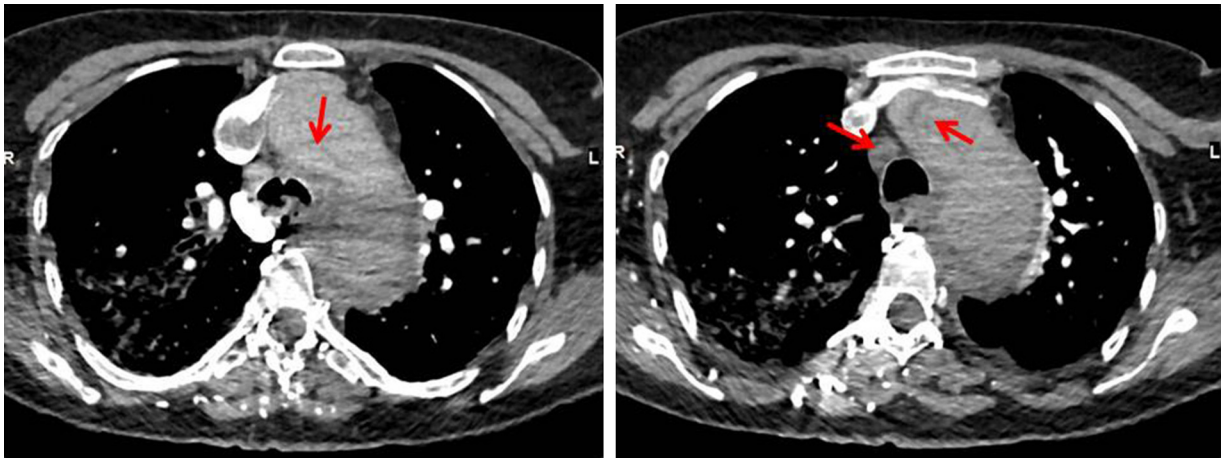

Fig. 2 – Perfusion CT-imaging shows a dilatation of the aortic arch, slight contrast enhancement within the aortic arch and intraluminal structures (arrow) indicating an intima flap of aortic dissection (a, left). An intima flap is also visible within the brachiocephalic trunk (arrow) (b, right).

dissection-related hematoma [11]. Since in our patient, unfortunately, imaging of the left atrium was not carried out by computed tomography, and neither echocardiography nor autopsy has been carried out, we cannot assess if atrial fibrillation was due atrial compression. Apart from atrial fibrillation, the electrocardiogram of our patient showed signs of ischemia which may be caused by concomitant atherosclerotic coronary artery disease, by compression of the coronary vessels by the hematoma or by extension of the dissection into the coronary arteries. Furthermore, it remains uncertain whether the ischemic stroke of our patient resulted from cardioembolism due to atrial fibrillation or from dissection of the right carotid artery. Most likely the stroke was due to carotid artery dissection since the entire territory of the right median cerebral artery showed hypoperfusion.

4. Why should an emergency physician be aware of this?

Aortic dissection is often a diagnostic challenge, especially in pain-free patients, and may result in catastrophic outcome, like in the presented patient. Apart from imaging of the aortic arch by computed tomography in acute stroke patients, the electrocardiogram may be indicative for aortic dissection if it shows signs for myocardial ischemia in previously healthy patients. Stroke in aortic dissection with atrial fibrillation is more likely due to involvement of the carotid artery than due cardioembolism from atrial fibrillation.

Conflict of interest

None declared.

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