

Covid-vaccine-fear-induced paroxysmal atrial fibrillation causing multiple acute arterial infarctions: a case report

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Dear Editor,

Negative emotions such as stressful stimuli, sadness, or anger have been suggested as triggers for atrial arrhythmias. Covid vaccination fear, as an acute stress situation, could lead to atrial arrhythmias with devastating consequences. Herein, we report a case with multiple acute arterial infarctions, which were caused by covid-vaccine-fear-induced paroxysmal atrial fibrillation (AF).

A very hesitant and anxious 65-year-old man decided 1 year after the initiation of the National Vaccination Campaign for COVID-19 in Greece to receive vaccination. His medical history was unremarkable, without pre-existing cardiovascular risk factors. The patient was extremely afraid of vaccination; while sitting in the waiting room at the vaccination center, he felt suddenly dizzy and fainted. He was transferred immediately to the Emergency Department of our Hospital and was initially evaluated by cardiologists.

The electrocardiogram (ECG) revealed a newly diagnosed AF, and a computer tomography (CT) of the chest and abdomen showed acute splenic and multiple renal infarctions (Figure 1). The subsequent neurological examination revealed dense left hemianopsia and moderate left hemiparesis with sensory deficit in the left upper and lower limbs. His initial National Institutes of Health Stroke Scale (NIHSS) score was 8 points. Baseline brain CT was unremarkable and the patient was treated with systemic intravenous thrombolysis (alteplase dose: 0.9 mg/kg) with an onset-to-treatment time of 178 min. The patient's symptoms resolved substantially, and his NIHSS score 1 h after thrombolysis was 3 points. Brain CT 24 h after thrombolysis disclosed an acute infarction in the territory of the right posterior

cerebral artery. An extensive workup was unremarkable for an underlying infection or any other triggers for cardiac arrhythmias.

We documented an excessive troponin elevation of 826 pg/ml (normal values <14 pg/ml) during the first 24 h after symptoms onset. Transthoracic echocardiogram revealed mild hypokinesia of the lateral wall of the left ventricle, suggesting myocardial infarction. A coronary angiography confirmed a severe circumflex artery stenosis, and stent implantation was carried out without any complications. The patient received dual antithrombotic therapy with clopidogrel and apixaban and was discharged with an NIHSS score of 1 point (mild hemianopsia).

The heart–brain interaction is well described not only in patients with heart failure, but also in the setting of negative emotions.^{1,2} Stress, anger, anxiety, and depression alter the autonomic response, increasing sympathetic and decreasing vagal activation.^{3–5} This can eventually result in cardiac arrhythmogenesis even in the setting of a structurally normal heart.⁶ In the case of our patient, the pre-existing coronary artery disease with the severe narrowing of the circumflex artery could be considered as an indirect sign of underlying pre-existing AF. In addition, transthoracic echocardiography revealed moderate left atrial enlargement (left atrial diameter: 47 mm). However, there was neither previous history of AF nor any reported symptoms of AF, while brain magnetic resonance imaging (MRI) excluded the presence of previous cerebral infarctions.

On the other hand, and in the era of the COVID-19 pandemic, many individuals remain hesitant or even reluctant to receive vaccination, despite the wide implementation of the vaccination campaign against COVID-19.⁷ Our patient is a representative paradigm of these negative and stressful feelings.

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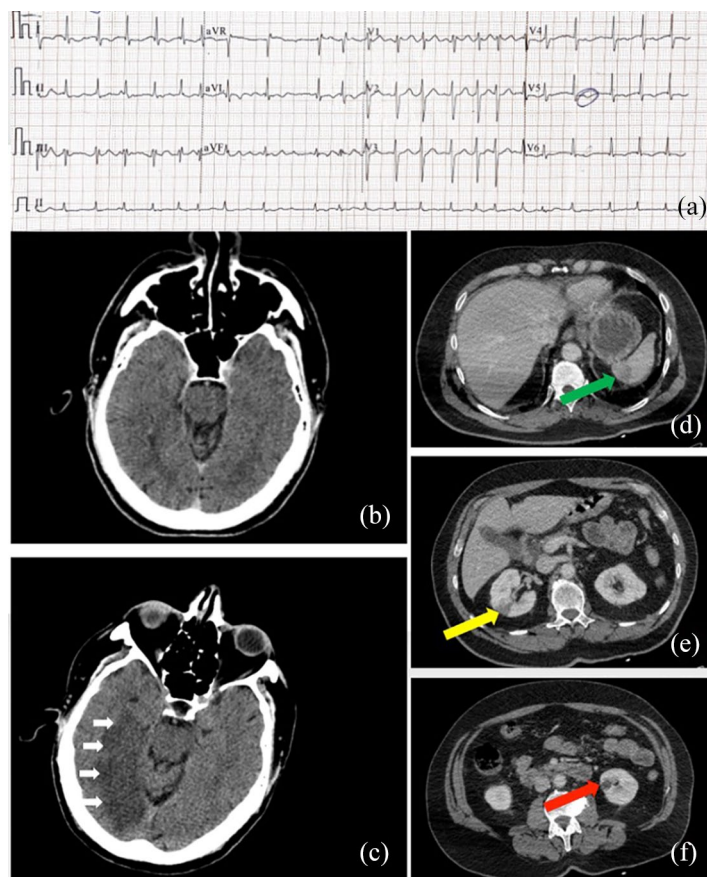


Figure 1. ECG and neuroimaging findings. (a) Admission ECG, revealing newly diagnosed atrial fibrillation. Brain CT at baseline (b) with no evidence of acute ischemic stroke and brain CT 24h after symptom onset (c; white arrows) disclosing a cerebral infarction in the right posterior cerebral artery territory. Abdomen CT scan on admission showing acute splenic (d; green arrow), right renal (e; yellow arrow), and left renal (f; red arrow) infarctions.

In conclusion, this case highlights the significant role of neuro-cardiac axis, since extreme fear of COVID-19 vaccine may trigger cardiac arrhythmias, causing arterial embolism with potentially devastating complications.

Ethics statement

A written informed consent was obtained from the patient to publish their medical data and images.

Author contribution(s)

Aikaterini Theodorou: Conceptualization; Writing – review & editing.

Eleni Bakola: Writing – original draft.

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