

# The unusual history of stroke due to coagulopathy caused by SARS-CoV-2 infection in a 14-year-old boy with two heart tumors

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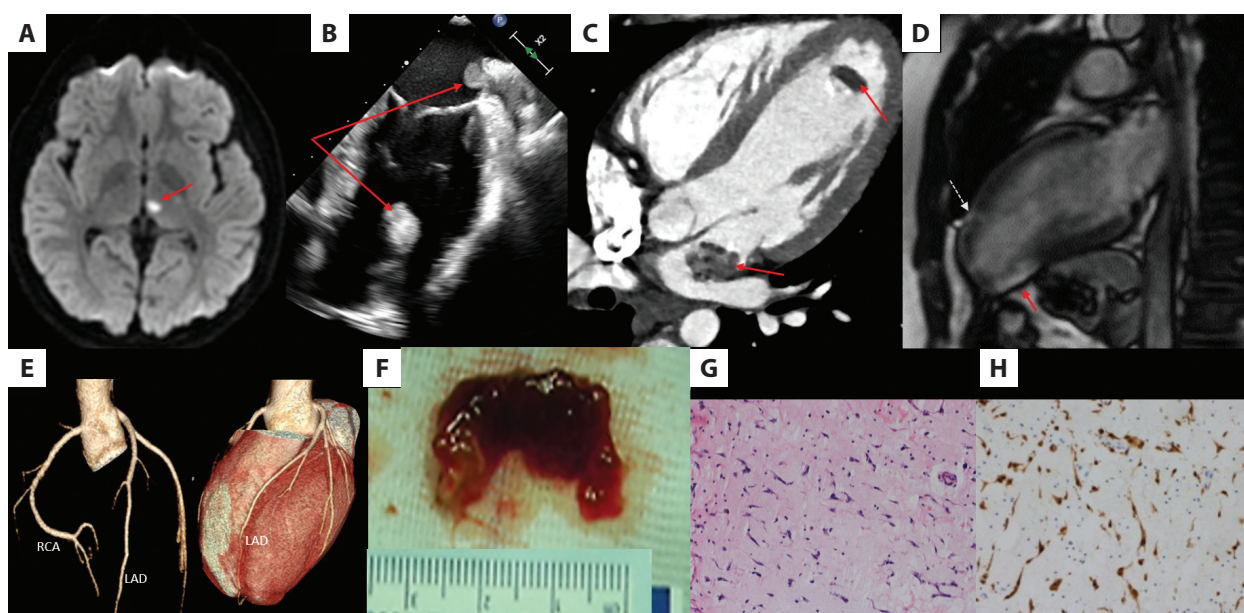
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A healthy 14-year-old boy felt unwell while swimming. Soon, he experienced nystagmus. The next day, when he was at the emergency department, he was admitted to the infectious ward since he tested positive in a SARS-CoV-2 antigen test. On admission, abnormal eye movements were observed, double vision when looking to the left, and slight asymmetry of the pupils otherwise without focal features of central nervous system damage. The head computed tomography (CT) scan showed normal cerebral structures. At the same time, brain magnetic resonance imaging (MRI) revealed abnormal intensity in the medial part of the left thalamus corresponding to the acute phase of ischemia (Figure 1A).

The diagnosis of ischemic stroke due to COVID-19-associated coagulopathy was established, and acetylsalicylic acid (ASA) was administered. Assessment of stroke risk factors revealed the homozygosity for the methylenetetrahydrofolate reductase 677C>T mutation, while Leiden mutation was not found. The antiphospholipid syndrome was

excluded, and other results (homocysteine, protein C, protein S, D-dimer, troponin levels) were normal.

The control brain MRI after 9 days showed the resolution of ischemia. The patient was discharged in overall good condition, and ASA treatment was maintained. Five weeks later, after a negative SARS-CoV-2 test, he was readmitted for cardiology consultation. Echocardiography revealed two movable echogenic structures: in the left ventricular (LV) apex, approximately 2.5 × 1.5 cm, and in the left atrium (LA) 2 × 3 cm (Figure 1B), along with hypokinesis of the apical region with normal ejection fraction of 70% calculated using the Simpson method. For this reason, cardiac MRI was performed, which confirmed the presence of two large structures in the LV and the LA and post-infarct foci in the 17<sup>th</sup> apex segment (Figure 1C). Coronary computed tomography angiogram showed no coronary stenosis (thrombus), including the distal left anterior descending coronary artery (Figure 1E), and visualized 2 nonenhancing structures in the LV and the LA. After imaging,



**Figure 1.** **A.** Brain MRI scan: axial DWI scan shows the focal region of a restricted diffusion — acute ischemic lesion (arrow) in the left posterior thalamus. **B.** 2DE image. Two large echogenic structures in the LV and the LA (arrows). **C.** Cardiac CT, axial view: hypodense soft tissue mass in the LV apex and the LA (arrows) — suspicion of double thrombi on CT. **D.** Cardiac MRI, the LV 2-chamber view, LGE image: the focus of late gadolinium enhancement in the apical segment of the LV wall (red arrow); the small focus of LGE visible also in the apical segment of the anterior LV wall (white arrow). **E.** Coronary CTA. 3D reconstruction showing normal coronary arteries. **F.** anatomical specimen, 2.9 × 2.1 cm from the LV apex. **G.** Myxoma. The mass was composed of stellate and spindle cells embedded within a myxoid stroma (hematoxylin and eosin stain, magnification × 100). **H.** Immunohistochemical staining for calretinin. A markedly positive immunohistochemical reaction in tumor cells. Lymphocytes without calretinin expression (magnification × 100)

Abbreviations: 2DE, two-dimensional echocardiographic; CT, computed tomography; CTA, computed tomography angiogram; DWI, diffusion weighted; LA, left atrium; LGE, late gadolinium enhancement; LV, left ventricle; MRI, magnetic resonance imaging

the most likely diagnosis was double LV and LA thrombus formation during SARS-CoV-2 infection. Therefore, ASA was discontinued, and nadroparin 2 × 1 mg/kg daily s.c. was initiated. After 8 days of intensive treatment, the thrombus did not diminish, and there was a high risk that mobile clots could lead to recurrent stroke. After consultation with several specialists to determine the treatment strategy, we decided to remove the clots during the cardiac surgery (Figure 1F). The result of the histopathology examination was unexpected (Figure 1G, H). It turned out that the masses removed from the heart were double myxomas with clots accumulated on the surface, which were most likely formed during the SARS-CoV-2 infection.

This is a rare case because, among children, myxoma is a rare heart tumor, while dual localization is a unique diagnosis [1–3]. Multiple and recurrent myxomas were rarely described as features of the Carney complex. Although our patient did not exhibit Carney complex symptoms, regular echocardiography follow-up was ordered to prevent myxoma recurrence and potential embolism [4]. Thrombus formation on the surface of cardiac tumors and its complications is a new medical phenomenon during the COVID-19 pandemic [5].

### Supplementary material

Supplementary material is available at [https://journals.viamedica.pl/kardiologia\\_polska](https://journals.viamedica.pl/kardiologia_polska).

### Article information

**Conflict of interest:** None declared.

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