Sudden cardiac arrest in the course of takotsubo syndrome in a 15-year-old girl

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The takotsubo syndrome (TTS) is a transient left ventricular apical contractile dysfunction caused by a stress factor. The clinical manifestation is similar to myocardial infarction. Early and remote prognosis are usually positive, whereas serious complications may occur in the course of TTS, including severe ventricular arrhythmia and cardiac rupture. Generally, TTS occurs in women at 60–80 years of age. However, cases of TTS in several-year-old children and teenagers have also been described [1–3].

A 15-year-old girl with prolapse of the mitral and tricuspid valve flap, with a several-month long medical history of ventricular arrhythmias, lost consciousness while writing a secondary school test. Moreover, her medical history included a stressful, several-month long examination period.

Sudden cardiac arrest (SCA) occurred with the ventricular fibrillation (CF) mechanism and pulseless electrical activity (PEA). Resuscitation actions were undertaken by the school personnel and were continued after 30 min by the Emergency Medical Service. The patient was defibrillated twice. Sudden cardiac arrest occurred again during transport to the Intensive Care Unit (ICU) of the Children's Hospital.

On admission to the ICU, ECG demonstrated sinus tachycardia 130/min and ST elevation in V2–V6 leads. The laboratory test showed an increased troponin level – 3.464 ng/ml. Following hemodynamic stabilization of the patient and cardiological consultation, the patient was subjected to coronarography. Examination revealed normal coronary arteries, whereas the concomitant ventriculography revealed extensive left ventricular contractility disorders typical of the Takotsubo syndrome, with ejection fraction (LVEF) 25% (Figure 1). Despite the intensive therapy, the patient remained unconscious during subsequent hospitalization and was subjected to respirator treatment. Symptoms of serious central nervous system (CNS) damage were neurologically determined.

On day 10 of hospitalization follow-up echocardiography was performed, showing resolution of contractility disorders, and LVEF was estimated at 60% (confirmation of TTS). Brain scintigraphy was performed, and revealed absence of brain tissue perfusion. On day 18 of hospitalization brain death was pronounced, and upon the parents' consent organs were removed.

According to the literature, TTS is typically caused in small children and teenagers by a physical factor (secondary TTS), whereas in adolescents it may be caused by a typical stress factor (primary TTS). Cases of TTS have been published in adolescents following injuries, with anorexia, intracranial hemorrhage and after surgical procedures. The occurrence of TTS at school age may be linked to examination stress. Takotsubo is less frequent in children, yet in contrast to adult patients, it typically possesses heart failure symptoms, loss of consciousness and serious cardiac arrhythmias [4, 5].

In the presented patient, the primary TTS was diagnosed due to the confirmed stress factor. However, due to previous SCA and resuscitation, the secondary form of Takotsubo induced by the catecholamines used during resuscitation cannot be ruled out.

The TTS pathomechanism has not been fully explained, yet thanks to registries and observational studies the knowledge on TTS, on the efficacy of applied treatment and types of possible complications, is becoming more extensive. Unfortunately, the proper diagnosis and treatment of TTS with SCA complication will not replace early and properly conducted resuscitation actions.

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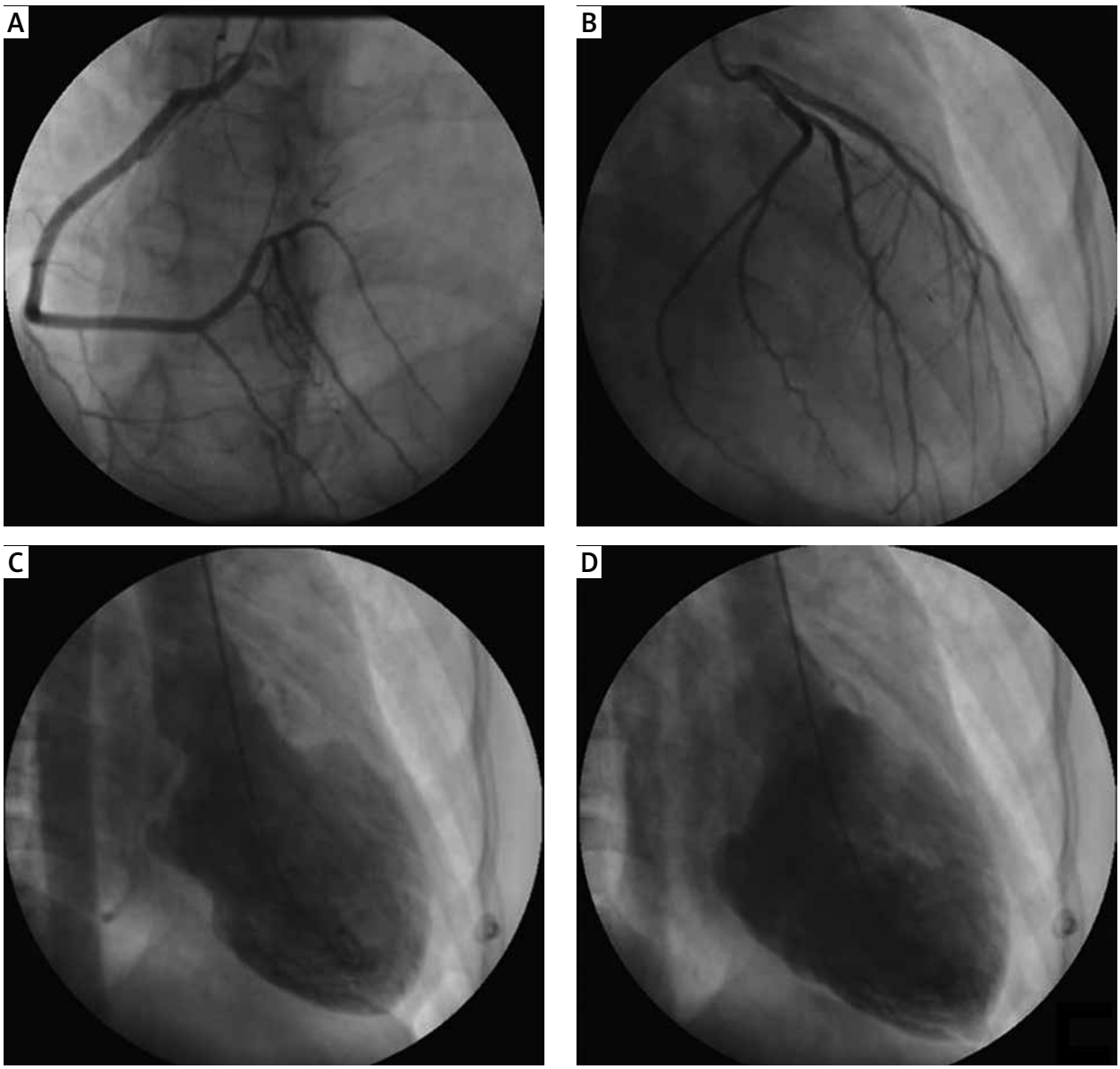

Figure 1. A – Coronarography of the right coronary artery, **B** – coronarography of the left coronary artery, **C** – ventriculography – left ventricular contraction (akinesia of the apex, apical and mid-segments of the left ventricle wall), **D** – left ventricular diastole

Conflict of interest

The authors declare no conflict of interest.

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