

Patent ductus arteriosus: Generally an anomaly of childhood, but is it always? Clinical implications in an adult patient

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Patent ductus arteriosus (PDA) is a persistence from fetal life that connects the aorta to the pulmonary artery. PDA closes physiologically after birth; however, when that does not happen, pharmacological treatment or interventional closure is implemented. When the shunt volume is small, it does not cause symptoms at an early age, so the patent vessel may not be diagnosed until the adult age [1].

We present the case of a 39-year-old male patient, previously without comorbidities, with a history of drug abuse, who was referred to the hospital because of heart failure symptoms such as significant deterioration of exercise tolerance, resting dyspnea, and lower limb edema that occurred *de novo*. The patient had been treated for an upper respiratory tract infection with antibiotic (doxycycline), without clinical improvement.

Laboratory tests revealed elevated concentrations of C-reactive protein (CRP, 76.2 mg/l), N-terminal pro-B-type natriuretic peptide (NT-proBNP 16656.0 pg/ml), D-dimer (5.43 mg/l), white blood cell count, and a slightly elevated troponin T concentration. Chest X-ray showed an enlarged cardiac silhouette, right pleural fluid, and inflammatory lesions of the right lung. An electrocardiogram (ECG) recorded sinus tachycardia with a heart rate of 120/min, negative T-wave in leads V5–V6, and QTc of 481 ms. Due to the high level of D-dimer, a computed tomography (CT) pulmonary angiogram was performed, which excluded pulmonary embolism but raised suspicion of PDA. Before further diagnostics, the patient experienced sudden cardiac arrest in the monitor-recorded torsade de pointes mechanism (TdP), which was terminated by an effective defibrillation. QTc prolongation

to 600 ms was observed on subsequent ECG (Supplementary material, *Figure S1*). Transthoracic echocardiography (TTE) revealed global left ventricular hypokinesis with reduced left ventricular ejection fraction (LVEF) of 29%, left ventricular end-diastolic diameter enlarged to 77 mm, a severe mitral regurgitation, a dilated pulmonary trunk, and blood flow from the aorta to the pulmonary trunk visible on color Doppler ultrasound. Systolic pulmonary arterial pressure (SPAP) was 31 mm Hg, without features of pulmonary hypertension (PH) on TTE. Transesophageal echocardiography confirmed the PDA with permanent left-to-right shunt (Qp/Qs ratio 1.7). The patient did not have an audible Gibson murmur typical of PDA [2]. Coronary CT angiography did not show any narrowing in the coronary arteries but showed the exact anatomy of the PDA (*Figure 1*).

After stabilization of the clinical status, the patient was qualified for percutaneous closure of the PDA. The procedure was performed with a good result with an implanted device Amplatzer Duct Occluder 10 mm (Supplementary material, *Figure S2A–B*).

During the follow-up performed 2 months after the surgery, the patient felt well, QTc was normal, and TTE showed a good long-term outcome of the procedure, normokinesis of the inferolateral wall with LVEF of 30%, and mild mitral regurgitation.

We cannot exclude the involvement of drug abuse in the etiology of heart failure in this case, but PDA seemed to be the key cause of this condition. Based on this case, it is important to use echocardiography to assess the heart for various congenital defects even at adult age. Due to the increased number of

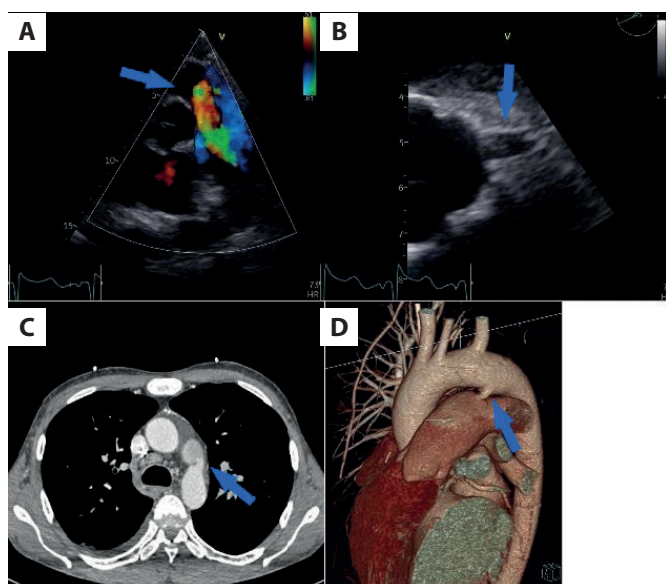


Figure 1. A. Transthoracic echocardiography color Doppler: blood flow from the aorta to the pulmonary trunk (arrow). B. PDA visible on transesophageal echocardiography (arrow). C. PDA on CT angiography (arrow). D. PDA on CT angiography 3D reconstruction (arrow)

Abbreviations: CT, computed tomography; PDA, patent ductus arteriosus

premature infants in recent years, detection of congenital heart defects has increased, including PDA in adult patients [3]. PDA should be suspected in adults with an audible characteristic machine murmur. Also, when no other causes of heart failure are found, such as right ventricular overload or PH, congenital defects, such as PDA, should be actively searched for. Transcatheter PDA closure remains an internationally recognized method in both children and adults with symptoms of heart failure. The procedure is safe when up-to-date devices are used [4].

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

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