Giant left ventricular aneurysm following arterial switch operation

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Arterial switch operation (ASO) with coronary artery translocation and the Lecompte maneuver (positioning of the pulmonary artery anteriorly to the aorta) are the treatment of choice in newborns with d-transposition of the great arteries (d-TGA). The aorta and pulmonary trunk are transected and transferred with coronary arteries to the opposite semilunar valves. Early postoperative complications include excessive pericardial and pleural drainage, heart failure, cardiac arrhythmias, distortion of pulmonary arteries, infections, endocarditis, and coronary artery occlusion causing ischemia with contractility impairment, cardiac aneurysm formation, which necessitate surgical treatment [1–4].

We demonstrate an unusual presentation of a life-threatening left ventricular aneurysm which was successfully operated on with a noncellular xenogeneic extracellular matrix patch without sequelae.

A 2-week-old female infant was diagnosed with a congenital heart defect: d-TGA with large ventricular septal defect (VSD). The child underwent, at the age of 9 days, arterial switch operation, VSD closure, and simultaneous coronary artery translocation during cross-clamp. Epicardial intraoperative echocardiography showed mild distortion of pulmonary arteries, wide coronary arteries with sufficient flow, and normal myocardial contractility. Pericardial drainage was provided routinely. The general condition of the patient was poor with symptoms of cardiac compromise requiring vasopressors (dopamine, adrenaline) and inotrope (milrinone) infusions. On the first postoperative day, chest revision was necessary. The heart stimulation was established via temporary epicardial electrodes due to complete atrioventricular block (CAVB). The patient also required peritoneal dialysis with a Tenckhoff catheter. On the fifth postoperative day, CAVB converted into sinus rhythm. The electrocardiogram (ECG) revealed normal sinus rhythm, right axis deviation, right ventricular hypertrophy (positive T wave in lead V1) without signs of ischemia. Recurrent tachyarrhythmias with wide QRS complexes were treated effectively with amiodarone infusion.

Postoperative transthoracic echocardiography (TTE) revealed right diaphragm dysfunction, small residual VSD with L-R shunting, mild pulmonary artery stenosis, mild pulmonary and aortic regurgitation, and hyperechoic 5-mm cistern above the lateral wall of the left ventricle (LV) (Figure 1A–C). The contractility of the myocardium was slightly decreased (LV ejection fraction 50% using Simpson formula with the normal range of 55%–65%).

TTE suggested the diagnosis of localized pericardial effusion. However, the hyperechoic cistern communicated with the LV via two fistulae (Supplementary material, *Videos S1–S3*). The gradual distention of the aneurysm up to 12 mm provided a high risk of rupture with cardiac tamponade which prompted the reoperation on the 12th postoperative day. A noncellular xenogeneic extracellular matrix patch was used for fistulae and aneurysm closure and strengthening of the lateral wall. The postoperative course was uneventful.

The most probable causes of the aneurysm formation were technical difficulties during coronary arteries mobilization and

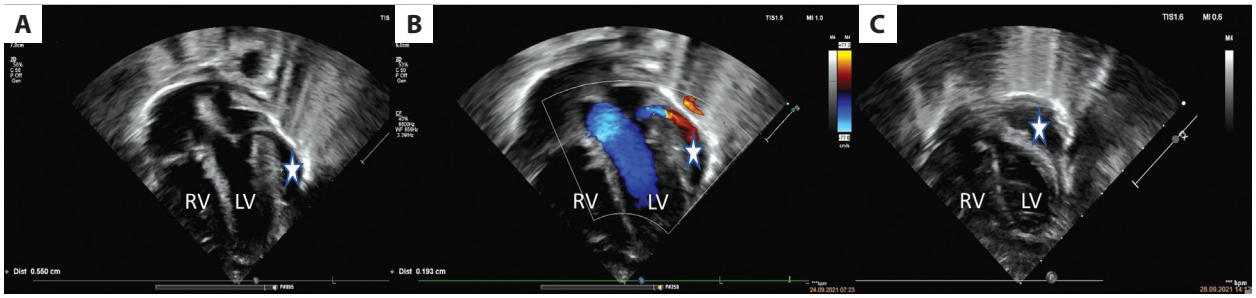

Figure 1. Transthoracic echocardiography. **A.** Five chamber view. Two-dimensional echocardiography. Large lateral ventricular wall aneurysm (white star) with a left ventricular fistula below the mitral annulus. **B.** Five chamber view with color Doppler flow through the fistula communicating the left ventricle with the aneurysm. **C.** Five chamber view. Left ventricular lateral wall view with the giant aneurysm distended up to 12 mm

Abbreviations: RV, right ventricle; LV, left ventricle

translocation, although the leading mechanism of aneurysm development is myocardial ischemia, which requires interventional or surgical procedures [5].

This is the first case in the literature on cardiac aneurysm with ventricular fistulae following arterial switch operation with successful surgical embolization.

In a 6-month follow-up, the condition of the patient was good. TTE revealed an occluded aneurysm without a residual shunt, normal contractility of the myocardium, and right diaphragm (Supplementary material, *Video S4*).

Supplementary material

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

Article information

Conflict of interest: None declared.

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