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Stenting of a non-stenosed left main coronary artery in a 16-months old infant resulting in significant hemodynamic improvement

Short title: Non-stenosed LMCA PCI in 16-months infant

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A 16-month old baby with suspected Alagille syndrome was referred to the pediatric cardiac surgery department due to severe left and right ventricular outflow tract obstruction.

The ascending aorta was opened using the hockey-stick aortotomy longitudinally towards the non-coronary sinus. The tricuspid aortic valve was visualized. All leaflets of the valve were thickened and non-symmetrical, with the left-coronary leaflet severely hypoplastic and fused with the aortic wall. The entrance to the left sinus of Valsalva was severely narrowed to a diameter of 2 mm, impairing the blood inflow to the left coronary artery. In addition, the larger right coronary leaflet partially overlapped the hypoplastic left leaflet, which additively impaired the inflow to the left sinus of Valsalva. The fibrous tissue narrowing the left coronary

sinus was partially resected. The ascending aorta was widened with a diamond-shaped Goretex patch extending into the non-coronary sinus.

After the reperfusion and rewarming, severe tachyarrhythmias and several episodes of ventricular fibrillation were ceased with electrical shocks. Due to the hemodynamic instability, mechanical support of the circulatory system was commenced.

An echocardiogram showed akinesia of the free wall of the left ventricle and the interventricular septum. Subsequent aortography showed impaired flow through the left coronary artery by the left coronary leaflet tissue (**Figure 1A, B**, Supplementary material, *Video S1*). The selective angiography of the artery showed a normal course without narrowing (**Figure 1C**). The multidisciplinary heart team, consisting of a cardiac surgeon, pediatric and adult coronary interventional cardiologist, decided to implant a stent in the left main coronary artery and extend it to the aorta's lumen to improve perfusion. An H-Stick catheter was placed in the ostium of the left coronary artery. A drug-eluting 3.5 × 8 mm Xience Pro S stent (Abbott Laboratories, Abbott Park, IL, US) was deployed in the ostium extending to the lumen of the aorta. The control aortography showed improved flow in the left coronary artery (**Figure 1D**, Supplementary material, *Video S2*). The procedure had no complications. In the post-procedural course, gradual improvement of the left ventricular systolic function and hemodynamics allowed the disconnection of the mechanical circulatory support.

Percutaneous coronary artery interventions in the pediatric population are extremely rare. Absence of dedicated hardware results in many technical difficulties and potentially serious complications. Most common pediatric coronary artery interventions are performed in patients with Kawasaki syndrome, post-transplant vasculopathy or after surgical operations involving coronary ostia. Literature regarding these procedures in infants is scarce and consists of several case reports and series suggesting acceptable long term results with emphasis on good stent dilatation and dual antiplatelet therapy after the procedure [1, 2]. It is also crucial to consider coronary stenting in the context of the child's growth and use stents which are capable of being dilated in the future. In the presented procedure, the diameter of the implanted stent may be expanded up to 5.5 mm which is sufficient for most adults.

The presented case concerned a critically-ill infant who had undergone stenting of a non-stenosed left coronary artery allowing weaning from the mechanical support of the circulatory system.

Supplementary material

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

Article information

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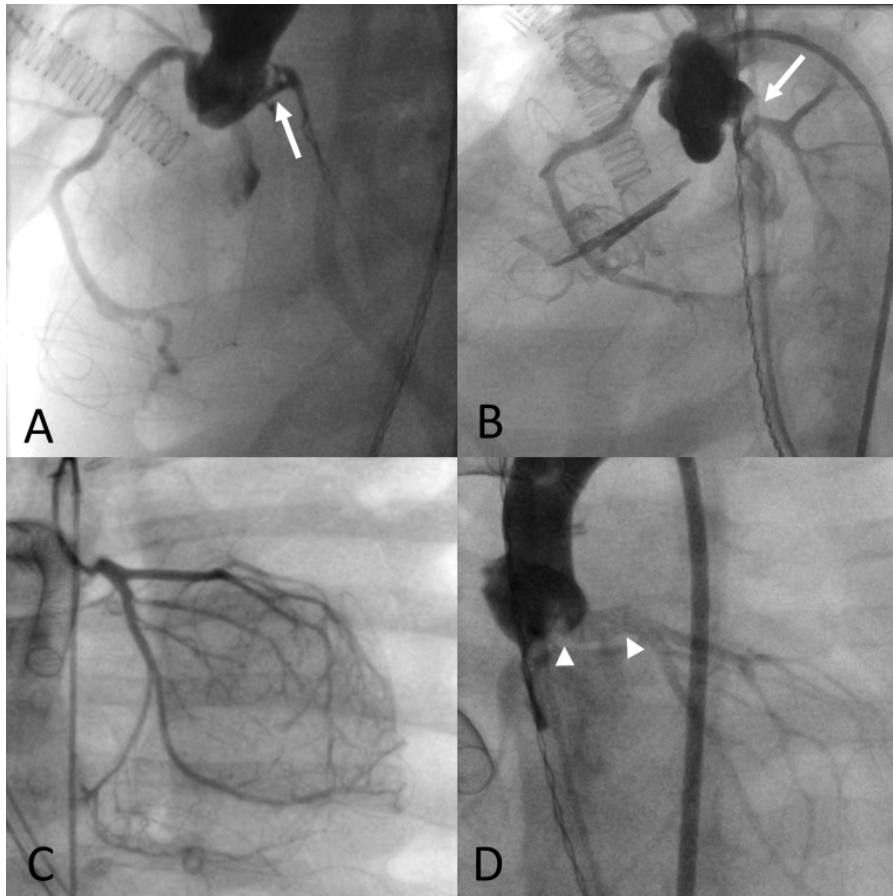


Figure 1. Stenting of a non-stenosed left coronary artery in an infant on circulatory support. **A, B.** Initial aortography exposing obstructed left coronary artery perfusion caused by the tissue flap in the ostium (white arrow). **C.** Selective angiography of the left coronary artery with non-stenosed stem of the artery. **D.** Final aortography presenting improved blood flow of the left coronary artery with tissue flap buried under implanted stent (white arrowheads). The function of the aortic valve did not deteriorate on further observation