A case of multiple coronary atresias: a rarity even within the family of coronary anomalies

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A 46-year-old man was referred for analysis of recurrent anginal symptoms. Exercise testing showed moderate ST-depression in anterior leads. Transthoracic echocardiogram showed no wall motion abnormalities, valvular heart disease, or other structural abnormalities. Adenosine-stress H$_2^{15}$O myocardial perfusion PET showed reversible perfusion defects in mid-ventricular anterior and anterolateral wall (Supplementary material online, Figure S1). Invasive coronary angiography displayed several coronary abnormalities (Panels A and C; Supplementary material online, Cine S1 and S2). One coronary artery originated from the left sinus of Valsalva and after a short course in the anterior interventricular groove (as an left anterior descending coronary artery (LAD) and branching off septal perforators), made a U-turn and followed the course of left circumflex coronary artery towards the left atrioventricular groove. The distal LAD was replaced by a branch from the RV branch. The posterior descending coronary artery was interrupted and the distal part was formed by the same RV branch. Coronary computed tomography angiography (CCTA) showed no obliterated lumina and also no coronary calcifications, confirming the diagnosis of congenital atresia (Panels B and D; Supplementary material online, Figure S2). Fusion of PET and CCTA clearly related the atresias to a large territory of hypoperfusion (Supplementary material online, Figure S3). Apparently, even in this time window of >40 years, angiogenesis (true neovascularization) did not lead to restoration of perfusion. This supports the notion that arteriogenesis, the enlargement of pre-existing anastomoses, is the prevailing mechanism to restore blood flow to hypoperfused myocardium. Surgical revascularization was not possible because there was no appropriate landing zone. Absence of true coronary stenoses excludes percutaneous revascularization. Our patient was discharged with anti-anginal treatment and cardiovascular lifestyle advices.

Supplementary material is available at European Heart Journal online.