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Can we predict the unfavorable coronary features in patients with transposition of the great arteries long-term after an arterial switch operation?

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Introduction: Coronary artery complications are the main reason for early mortality after arterial switch operation (ASO), late complications are rather rare and there is no consensus regarding the need and indications for the routine coronary artery evaluation during follow-up, as well as the modality which should be chosen as a first line assessment.
The aim of this study was to present the frequency of coronary abnormalities in asymptomatic patients with transposition of the great arteries (TGA) after an ASO discovered in coronary computed tomography angiography (CCTA) and their potential "red flags" in other examinations.
Patients and methods: Among 750 patients with TGA who had ASO between years 1991- 2016, the initial group of 50 consecutive asymptomatic patients, who had routine coronary artery evaluation over 17 years after ASO according to our institutional protocol, were qualified for this study. Additionally all these patients had echocardiographic examination, electrocardiography (ECG), Holter ECG and cardiopulmonary exercise test(CPET), those who had significant abnormalities were also qualified for perfusion scintigraphy or stress MRI
Results: The frequency of coronary anomalies in this series was 28%. In 30 patients (60%) unfavorable coronary features were detected: ostial stenosis(3), muscular bridge(8), coronary fistula(1), inter-arterial course(4), proximal kinking(13), high ellipticity index(5), proximal acute angulation LCA (<30 degree) of LCA(19), proximal acute angulation of RCA(7). The presence of this features was not correlated significantly with coronary anomalies, surgical technique, associated heart defects or neoaortic root diameters. The presence of acute angulation of coronary arteries was statistically significant correlated with its inter-arterial course(p=0.037); high ellipticity index(p=0.025) and proximal kinking course(p=0.002).
The abnormal CCTA result could not be predicted by reviewing surgical report, ECG, Holter ECG and CPET. The results of perfusion scintigraphy also didn't reveal any significant abnormal findings in those patients who had discovered abnormalities in routine CCTA.
Conclusion: The complex coronary setups with unfavorable, high-risk features are common In patients with TGA after an arterial switch operation. The selection of high risk patients cannot be made indirectly and CCTA provides accurate and useful information for the postoperative management.