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When a 90% stenosis is not the whole story: a single coronary artery with an interarterial left main course

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Introduction: A single coronary artery is a rare congenital coronary anomaly with variable clinical presentation. Its clinical significance is largely determined by the anatomical course of the anomalous vessel. An interarterial course between the aorta and pulmonary artery, particularly involving the left coronary system, is considered a potentially high-risk anatomical feature[1,2]. Coexistence with significant atherosclerotic coronary artery disease represents an additional diagnostic and therapeutic challenge.

Case report: 45-year-old woman with arterial hypertension, dyslipidemia and active smoking was admitted due to recurrent exertional chest pain radiating to the left arm and reduced exercise tolerance. She was hemodynamically stable without signs of heart failure. Electrocardiography showed no ischemic changes, while high-sensitivity troponin I was mildly elevated (38.0–44.4 ng/L). Laboratory evaluation revealed severe microcytic anemia (hemoglobin 89 g/L), subsequently attributed to chronic uterine blood loss. Transthoracic echocardiography demonstrated preserved biventricular systolic function (LVEF 70%), without regional wall-motion abnormalities or significant valvular disease. Coronary angiography revealed a 90% proximal right coronary artery (RCA) stenosis and an anomalous left coronary artery originating from the right coronary sinus. Coronary CT angiography further characterized a single coronary artery arising from the right coronary sinus. Shortly after its origin, the RCA gave rise to the left main coronary artery (LM), which originated at an acute angle and followed an interarterial course between the aortic root and pulmonary artery, without a slit-like ostium. No significant atherosclerotic lesions were found in the left coronary system. Exercise testing was terminated due to chest pain without significant ischemic ECG changes or arrhythmias. Following multidisciplinary Heart Team discussion, surgical treatment was selected. During the same hospitalization, the patient underwent triple coronary artery bypass grafting (LIMA–LAD, SVG–OM1 and SVG–RCA) with surgical occlusion of the anomalous LM origin. The postoperative course was uncomplicated. Predischarge coronary CT angiography confirmed patent SVG–OM1 and SVG–RCA grafts and contrast filling of the gracile LIMA–LAD graft, with complete occlusion of the anomalous LM origin.

Conclusion: This case highlights the diagnostic and therapeutic complexity of concomitant obstructive coronary artery disease and potentially high-risk congenital coronary anatomy. Multimodality imaging and multidisciplinary Heart Team assessment were essential for defining the anatomy and selecting a surgical strategy addressing both pathologies.

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LITERATURE

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