

Anomalous Single Coronary Artery with Absent Right Coronary Artery

Diagnosed with the Aid of 64-Slice Multidetector Computed Tomographic Angiography

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A 46-year-old woman with a history of hypercholesterolemia, hypothyroidism, and cigarette smoking presented to the emergency department because of recurrent episodes of substernal chest pain. Her family history included early-onset myocardial infarction. Electrocardiography revealed sinus rhythm without significant ST-T changes. Recent exercise-stress echocardiography had shown preserved left ventricular function (ejection fraction, 0.60) and a normal stress test result.

The patient was next evaluated by 64-slice multidetector computed tomography of the coronary arteries, which revealed an anomalous single coronary artery arising from the left sinus of Valsalva, together with an absence of the right coronary artery (RCA). The left circumflex coronary artery (LCx) was the dominant vessel; it appeared to continue, without significant stenosis, beyond the atrioventricular groove up to the level normally occupied by the RCA (Fig. 1). The left main coronary artery bifurcated into the left anterior descending coronary artery (LAD) and the LCx. Only a single coronary ostium (that of the left main) was seen to arise from the aorta (Fig. 2). The patient's calcium score was zero. Subsequently, her coronary anatomy was confirmed by cardiac catheterization (Fig. 3). She was treated medically with aspirin, metoprolol, and rovastatin.

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Comment

Isolated single coronary artery is extremely rare, with an incidence of 0.024% to 0.066% in the general population.¹ Most patients are asymptomatic, and prognoses vary. Group I anomalies, defined as solitary dominant vessels that follow the course of either a normal right or a normal left coronary artery (in accordance with the modifi-

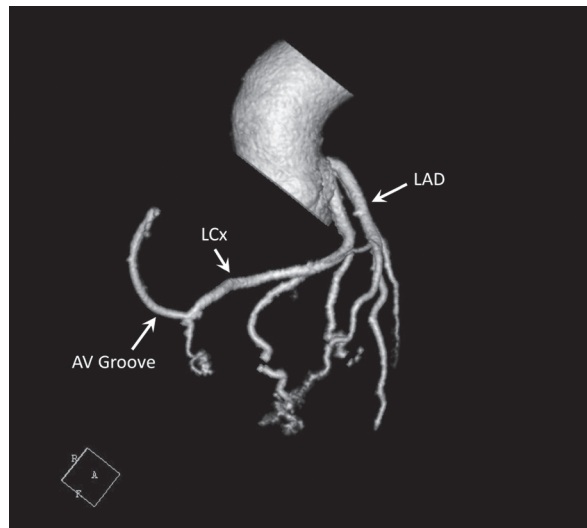


Fig. 1 Computed tomographic angiogram. Three-dimensional volume-rendering view (anterior) shows an anomalous single coronary artery from the left sinus of Valsalva, together with an absence of the right coronary artery. The left circumflex artery (LCx) continues beyond the atrioventricular (AV) groove as right coronary artery distribution.

LAD = left anterior descending coronary artery

cation of Lipton's classification^{2,3}), are extremely rare and generally have a benign clinical course.⁴ Our images show an anomalous coronary artery (L-1 subtype) that originates from the left sinus of Valsalva, gives off the LCx in normal fashion, and then continues in the

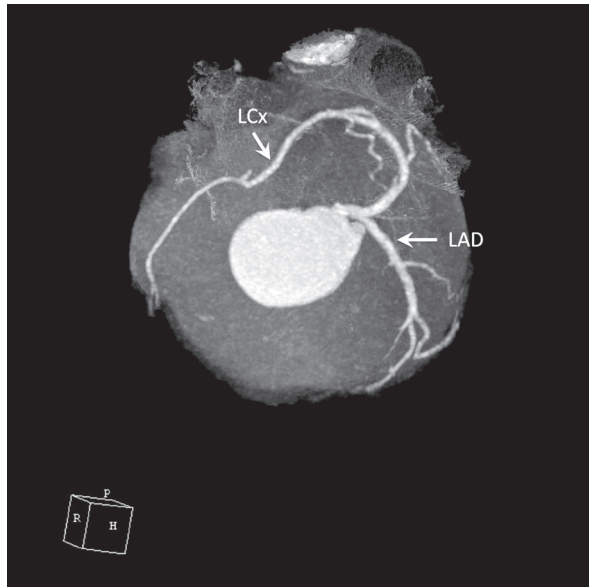


Fig. 2 Computed tomographic angiogram. Three-dimensional volume-rendering view (superior) shows an anomalous single coronary artery arising from the left sinus of Valsalva and the left circumflex coronary artery (LCx) continuing as right coronary artery distribution. There is no evidence of a dual ostium.

LAD = left anterior descending coronary artery

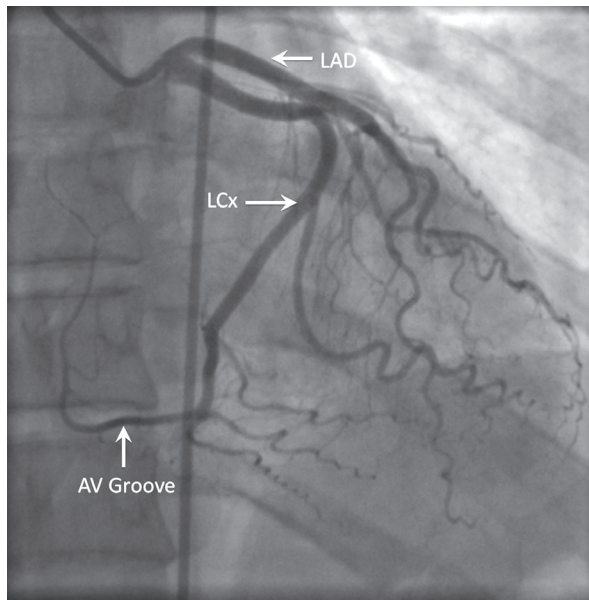


Fig. 3 Coronary angiogram of the left coronary artery in the posteroanterior projection confirms that the left circumflex coronary artery (LCx) continues as right coronary artery distribution.

AV = atrioventricular; LAD = left anterior descending coronary artery

atrioventricular groove up to the level of the RCA. The blood supply to the right ventricular free wall is similar to that provided by a native RCA that arises from the right coronary cusp.

Most coronary anomalies are found incidentally during coronary angiography. A recent study⁵ demonstrated that multidetector computed tomography can be a noninvasive alternative to conventional coronary angiography for imaging anomalous coronary arteries. Medical treatment is recommended in patients who present with single coronary artery in the absence of ischemia.⁶

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