

Multislice Computed Tomography of a Repaired Anomalous Left Coronary Artery Arising from the Pulmonary Artery

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In September 2006, a 49-year-old woman with chest pain was referred to our facility for multislice computed tomography (MSCT). Two years earlier, she had undergone surgical correction of a congenital coronary defect—the anomalous left coronary artery arising from the main pulmonary artery (ALCAPA). During that operation, the abnormal left main coronary artery (LMCA) was ligated, and (per Cooley's technique¹) a saphenous vein bypass graft was placed to connect the aorta with the left anterior descending coronary artery (LAD).

Sixty-four-slice MSCT, performed with image reconstruction in mid-diastole, revealed a widely patent saphenous vein graft with anastomosis to the mid-ascending aorta and the mid-LAD. The origin of the LMCA was ligated (not shown), so that the proximal LAD and the left circumflex system filled retrogradely through the graft. The right coronary artery was the dominant vessel and appeared large and tortuous throughout its course. It supplied a medium-sized, acute marginal branch and continued distally as a large posterior descending artery that supplied the left ventricular apex (not shown).

Comment

An ALCAPA is a rare but serious congenital anomaly. It was found to occur in 1 of every 300,000 live births, according to a report from the Toronto Heart Registry in 1951.² This anomaly was first comprehensively described by Bland and colleagues³; hence, it is also known as Bland-White-Garland syndrome. In this syndrome, the coronary anomaly causes blood to flow in a retrograde fashion toward the low-resistance pulmonary artery, resulting in myocardial ischemia, if not infarction.⁴

The clinical manifestations of this anomaly are diverse, and they depend on the myocardial distribution of the artery, the number and size of collateral blood vessels, and the pulmonary vascular resistance. From 4 to 6 weeks after birth, infants with ALCAPA can present with progressive feeding difficulties, diaphoresis, and pallor, progressing to signs and symptoms of shock, or they may present later in childhood or during adulthood with chest pain, dyspnea, fatigue, palpitations, or even sudden death.⁵

Late presentations of ALCAPA are relatively rare, and late-presenting patients usually have an extensive collateral blood supply that enables growth into adulthood. Our patient was unique in that she was asymptomatic until age 47, when she started to experience occasional exertional chest pain and fatigue. To our knowledge, there has been no prior report of MSCT examination of a repaired ALCAPA.

Various operative procedures have been recommended for ALCAPA. Sabiston and co-authors⁴ reported the 1st successful surgical repair, which involved a simple ligation of the anomalous coronary artery at its pulmonary origin. Cooley and associates¹ proposed the use of a Dacron interpositional graft from the aorta to the left coronary artery to create a 2-vessel coronary system. Subsequently suggested bypass procedures and surgical methods have involved the use of a saphenous vein graft, an inter-

nal mammary artery graft, or the left subclavian artery to improve surgical outcomes and overcome anatomic constraints.⁶⁻⁸

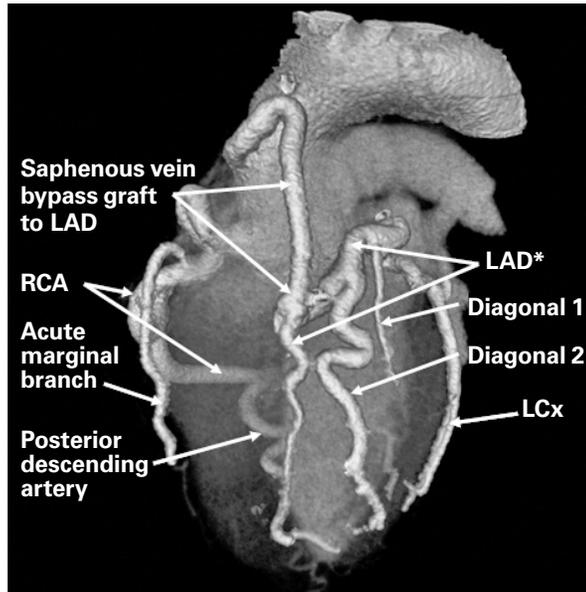


Fig. 1 Volume-rendering of a 64-slice computed tomographic scan shows a widely patent saphenous vein graft between the mid-ascending aorta and the mid-left anterior descending artery* (LAD). The graft provides retrograde blood flow to the proximal LAD and its branches, and to the left circumflex artery (LCx). The right coronary artery (RCA) is dominant: rather large in caliber and tortuous throughout its course. The RCA supplies a medium-sized acute marginal branch and continues distally as a large posterior descending artery.

*Previously arising from the pulmonary artery

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