Complete Left Coronary Artery Obstruction

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A case of angiographically documented complete left coronary artery (LCA) obstruction is presented. Complete occlusion of the main LCA is associated with a poor prognosis, and patients with this lesion should be considered for immediate emergency coronary bypass graft surgery.

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Oclusive atherosclerotic disease of the main left coronary artery (LCA) before its bifurcation into the left anterior descending (LAD) and left circumflex coronary (LCF) arteries has been reported in 10 percent of patients with angiographic evidence of coronary atherosclerosis. However, complete ostial narrowing by atherosclerotic obstruction of the left coronary arteries has been described. LCA atherosclerotic obstruction with no distal filling of the LCA branches in living man has rarely been reported. This report presents angiographic evidence of complete LCA occlusion and indicates the serious prognostic implications of such a lesion.

**Case Report**

A 47-year-old caucasian man with known type IV hyperlipoproteinemia was referred to the Hospital of the University of Pennsylvania for coronary angiography. At age 42 years, he was hospitalized with an acute myocardial infarction after several months of angina pectoris. The patient was unable to return to work because of severe angina provoked by exertion, exposure to cold, and by meals, and was treated with isosorbide dinitrate and nitroglycerin. Crescendo angina requiring 20 nitroglycerin tablets/day culminated in a second myocardial infarction at age 45 years. One year prior to his catheterization at the Hospital of the University of Pennsylvania he was hospitalized for an anterosetal myocardial infarction and was informed he had a ventricular aneurysm; he was told he had had cardiac arrest requiring resuscitation in the ambulance. Two months before angiography he was hospitalized with "coronary insufficiency" and was discharged on isosorbide dinitrate, propranolol, chlorozapexide and nitroglycerin, which he used 6-8 times/day for treatment and prophylaxis. At the time of catheterization, he admitted to dyspnea on exertion in addition to his exertional and nocturnal angina, which was characterized as a retrosternal pain with radiation to the neck and arms.

**FIGURE 1.** Single frame from a 35 mm coronary cineangiomgram of the left coronary artery in left anterior oblique position. Arrow indicates occluded main left coronary artery (LCA).
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Figure 2. Single frame from a 35 mm coronary cineangiogram of the right coronary artery (RCA) taken in the right anterior oblique position. Extensive septal collaterals (S) to the distribution of the left coronary artery are indicated. The conus branch (C) of the RCA also supplies collaterals to the LCA. A temporary transvenous pacing catheter is indicated.

Physical examination revealed a regular pulse at 72 beats/min and blood pressure of 150/90 mm Hg. The jugular venous pulse was normal in wave contour and pressure; the carotids were equal with a normal upstroke. The lungs were clear to percussion and auscultation. Cardiac examination revealed the apex impulse to be in the 5th left intercostal space, 1 cm to the left of the mid-clavicular line. The first and second heart sounds were normal. An S4 was present at the lower sternal border (LSB) and an intermittent S5 was present at the apex. A grade 1/6 systolic ejection murmur was present at the LSB. An electrocardiogram showed normal sinus rhythm with evidence of an anteroseptal scar. ST depression and T wave inversions were present in the inferior and lateral precordial leads.

Right and left heart catheterization, selective coronary cineangiography (Sones technique), and left ventriculography were performed with the patient unsedated and in room air. A temporary transvenous pacemaker was placed in the right ventricle. There was no chest discomfort during the coronary angiography, but after the ventriculogram, the patient developed angina which was relieved with two nitrroglycerin tablets. Selective coronary arteriography demonstrated total obstruction of the main LCA 2 mm distal to the osmium and no filling of the LCA branches (Fig 1). The right coronary artery had several 50-75 percent proximal, mid and distal stenoses and supplied extensive collaterals to the branches of the LCA via multiple septal vessels (Fig 2). The left ventriculogram demonstrated a large anterolateral aneurysm and paradoxical systolic expansion of the apex and akinesis of the anterolateral wall above the apex.

The cardiac catheterization and angiographic study were well tolerated. After the evening meal, some six hours after the procedure, the patient had a verbal disagreement with a member of his family. He developed severe angina, rapidly became pulseless and expired despite resuscitative efforts. Permission for necropsy was refused.

**DISCUSSION**

Although complete occlusion of the RCA is frequently demonstrated during coronary angiography, acquired atherosclerotic occlusion of the main LCA with no distal filling of its branches is rarely seen. This is the first case of complete occlusion in the authors' experience with well over 1,000 cases of angiographically documented coronary atherosclerosis.

Although coronary angiography identifies most patients as right coronary dominant subjects, this dominance refers solely to an angiographic pattern. The dominant coronary artery angiographically is the vessel that crosses the posterior intersection of the atroventricular and interventricular grooves. Although the RCA crosses this point in over 90 percent of subjects, the LCA is the more important coronary artery and supplies most of the left ventricular myocardium and the interventricular septum. It is generally believed that complete occlusion of the LCA is rarely seen angiographically because complete occlusion of this vessel is usually fatal. Indeed, our patient had a cardiac arrest requiring resuscitation during an ambulance trip to the hospital one year prior to his catheterization.

The prognostic significance and surgical treatment of main LCA obstructive lesions have recently been reported by Cohen et al and Levine et al. Complete occlusion of the main LCA is associated with a poor prognosis, and patients with this lesion should be considered for immediate, emergency coronary bypass graft surgery.

**REFERENCES**


**Misdiagnosis of Valvular Aortic Stenosis in Isorhythmic Dissociation**

Michael L. Hinnen, M.D.,** E. Louise Kremkau, M.D.,† and Shahbudin H. Rahimtoola, M.B., F.C.C.P.

Failure to recognize isorhythmic dissociation and to record simultaneous ventricular and arterial pressure during cardiac catheterization led to the erroneous diagnosis of

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