Left main coronary artery aneurysm with chronic total occlusion of both left coronary arteries in a young athlete

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Abstract
Aneurysms of the left main coronary arteries are found in 0.1% of angiograms. This case involves an athlete with a left main coronary artery aneurysm, which was combined with chronic total occlusion of the proximal left anterior descending and proximal left circumflex coronary arteries. The extraordinary clinical presentation in this patient may be associated with good coronary collaterals, which may have developed in the patient in response to chronic total occlusion of the coronary artery by the aneurysm, and repeat myocardial hypoxia during high levels of performance as a soccer player.

Keywords: coronary aneurysm; left main coronary disease; intravascular ultrasonography; electron beam computed tomography

Left main (LM) coronary artery aneurysm is very rare, occurring in 0.1% of adults undergoing coronary angiography.1 Most reported cases of LM artery aneurysms were incidentally noticed at coronary angiography for evaluation of myocardial ischaemic symptoms. As our case presented with a small myocardial infarction, considering the regional wall motion abnormality detected at echocardiography, the infarction seemed to be caused by inadequate flow to the mid to distal LAD artery through the collaterals. LM aneurysms in older patients are more likely to be caused by coronary atherosclerosis. Other possible causes include Kawasaki disease.

Discussion
Aneurysms of the left coronary artery are rare.1 Most reported cases of LM artery aneurysms were incidentally noticed at coronary angiography for evaluation of myocardial ischaemic symptoms. As our case presented with a small myocardial infarction, considering the regional wall motion abnormality detected at echocardiography, the infarction seemed to be caused by inadequate flow to the mid to distal LAD artery through the collaterals. LM aneurysms in older patients are more likely to be caused by coronary atherosclerosis. Other possible causes include Kawasaki disease.
arteritis, mycotic–embolic disease, dissection, congenital malformation, and connective tissue disorders. Our patient’s young age, lack of coronary risk factors, and absence of coronary lesions except the bifurcation of the LM artery did not point to atherosclerosis as a cause. With no systemic involvement Takayasu’s disease was excluded, and negative serologic tests ruled out connective tissue disease. Lack of a history of any obvious condition excluded traumatic, infectious, or inflammatory causes. In patients with an aneurysm caused by Kawasaki disease the LM coronary artery is more frequently involved compared to patients with atherosclerotic coronary aneurysms (42% vs 4%). Serial coronary angiography studies have suggested that coronary aneurysms could regress or persist, or develop into stenosis of the vessel at the outlet of the aneurysm as a result of myointimal proliferation provoked by an inflammatory insult during the acute phase of Kawasaki disease. Collaterals and calcification are frequently associated with coronary lesions in Kawasaki disease. Although we could not determine a history of childhood Kawasaki disease in our patient, we believe that it might have been responsible for the insult to the bifurcation site involving the LM, proximal LAD, and proximal LCx coronary arteries, which led to aneurysmal change of the LM artery and total occlusion of the proximal LAD and LCx arteries, and concurrent formation of a collateral circulation over the years. IVUS and EBCT findings for Kawasaki disease included enlarged vessel size—that is, increased external elastic laminae, myointimal hyperplasia, and superficial calcification. IVUS and EBCT findings suggest chronic occlusion of the lesion site in our patient.

This is the first case of an athlete with chronic total occlusion of the LAD and LCx coronary arteries. The extraordinary clinical presentation in this patient may be associated with good coronary collaterals. Chronic total occlusion would have contributed to the formation of good collaterals. Conversely, repeated myocardial hypoxia during high performance as an athlete might have contributed to coronary collateralisation, although the effects of exercise on coronary collateralisation are controversial. Our case highlights the fact that coronary artery disease can be present in any individual, even young, fit sportsmen used to performing to the highest levels.