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Case Report Open Access

Why Fear Can Be Fatal?

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A 51-year-old previously healthy woman collapses after experiencing chest pain. The chest pain was preceded by severe emotional distress following a fire at her neighbors' house. This event caused extreme anxiety in the patient. Medics at the scene found a conscious patient and prepared to transport the patient. An electrocardiogram obtained in the ambulance revealed extensive anterior ST-segment elevation. During transport the patient became unconscious and pulseless. The medics immediately performed a successful defibrillation and admitted the patient to the emergency room in our hospital. The patient underwent emergency coronary angiography which demonstrated an anomalous LMCA arising from the right sinus of Valsalva. (Figure 1A) Right coronary artery (RCA) arose from appropriate sinus but different origin. (Figure 1B) LMCA, left circumflex and left anterior descending artery appeared to be angiographically normal. Because of the potential high-risk of sudden cardiac death in patients with an anomalous LMCA we felt it was prudent to completely define the route of the left main coronary artery in relation to the great vessels as an inter-arterial course between the aortic root and pulmonary artery would warrant surgical intervention. For that purpose, a 64-slice multidetector computed tomography (MDCT) coronary angiography (CTCA) was performed to further evaluate the coronary anatomy and to determine the course of anomalous LMCA. MDCT performed by an Aquilion 64 device (Toshiba Medical, Tokyo, Japan) and volume rendering and axial images were obtained. The LMCA coursed between the aortic root and main pulmonary artery and gave off the left anterior descending and left circumflex arteries in their normal position. (Figure 1C, Figure 1D) The RCA system was nondominant without significant stenosis. Because of the high risk of sudden cardiac death and the patients' history, she underwent surgical re-implantation of the anomalous LMCA to the left coronary sinus.

Discussion

Anomalous LMCA originating from the right sinus of Valsalva, either separately from the RCA is a rare congenital anomaly [1]. The anomaly may be catastrophic because the LMCA passes between the ascending aorta and main pulmonary artery, and exercise-induced ischemia due to arterial compression occurs in some cases [2]. Acute angle take-off of the LMCA from the aorta as in our case is another reason for myocardial ischemia. Acute angle take-off of the LMCA from the aorta limits coronary flow due to narrowed slit-like orifice of coronary ostium that collapses in a valve like manner [2]. Fear triggers surges of central sympathetic vasoconstrictor outflow and neuronal noradrenalin release, resulting in blood pressure and heart rate. These processes culminate myocardial ischemia. Pressure overloads due to the high systemic blood pressure results aortic wall tension. It is hypothesized that chronically elevated aortic wall tension is associated with aortic dilatation and regurgitation [3]. However acute pressure overload secondary to sympathetic vasoconstrictor outflow may cause increased aortic wall tension and dilatation. This process results with compression of LMCA between aortic root and main pulmonary artery in patients with Anomalous LMCA. Determination of coronary artery anomalies is frequently difficult with conventional coronary angiography because of the lack of 3-dimensional information which relates the course of the anomalous LMCA to the great vessels. MDCT can provide higher spatial resolution and higher temporal resolution rather than coronary angiography [4]. The integration of MDCT in hybrid PET/CT scanners will offer not only morphologic diagnoses, but also provide functional and clinical importance of the anomalous LMCA.

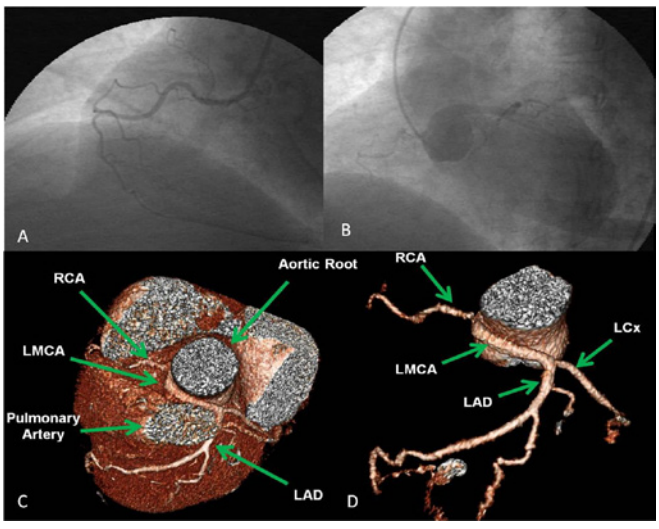

Figure 1:

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