Left Main Coronary Artery Atresia

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Congenital atresia of the left main coronary artery (LMCA) is a rare coronary anomaly in which there is no left coronary ostium, the proximal left main trunk ends blindly and blood flows from the right coronary artery to the left via small collateral arteries and retrogradely in at least one of the left-sided arteries. We describe a 50-year-old male with atypical chest pain and positive treadmill exercise test who received coronary angiography and spiral 64-slice computed tomography; both studies showed atresia of the left main coronary artery and very thin proximal left anterior descending artery and left circumflex artery and right coronary artery collateral to the left anterior descending and left circumflex arteries. Spiral 64-slice computed tomography can provide a non-invasive diagnostic tool for complex congenital coronary anomalies and clear anatomic vision of coronary arteries.

Key Words: Left main coronary artery atresia • Multislice computed tomography

INTRODUCTION

Congenital atresia of the left main coronary (LMCA) is a rare coronary anomaly in which there is no left coronary ostium, the proximal left main trunk ends blindly, blood flows from the right coronary artery (RCA) to the left via small collateral arteries and retrogradely in at least one of the left sided arteries. Multislice computed tomography (MSCT) can detect the anomalous origin and course of the coronary arteries in relation to the great vessels. We report a congenital left main coronary artery atresia case, which was well demonstrated by 64-slice computed tomography.

CASE REPORT

A 50-year-old male was rather well before and denied any systemic disease. He had smoked 1 pack of cigarettes a day for 30 years but had no family history of coronary artery disease. However, he had suffered from intermittent chest pain over the left chest wall during the recent 6 months with the chest pain usually lasting several minutes. The chest pain was not effort-related and not relieved by sublingual nitroglycerine, and there was no radiation to jaw or shoulder. The patient visited another hospital for help and was diagnosed to have mitral valve prolapse with atypical chest pain. Medication was prescribed for him but in vain. So, he visited our cardiovascular outpatient department for help. Physical examination was unremarkable. The electrocardiogram and echocardiography were normal. Exercise stress test showed 2 mm ST-T segmental depression in leads II, III, VF, V4, V5 and V6 during exercise at 3rd min and lasting for 5 minutes into recovery phase. Because of the positive result of treadmill exercise test, the patient received selective coronary angiography examination, which showed a dominant RCA providing intercoronary retrograde collateral to the left anterior descending artery (LAD) via conus branch and the left circumflex artery (LCX) via sinus node artery (SAN) branch and posterior lateral (PL) branch. The ostium of the LMCA could not be found. The coronary arteries were free of atherosclerotic stenosis and calcifications. Aortography demonstrated the absence of the left side coronary ostium. Spiral 64-slice computed to-
mography was performed after cardiac catheterization to further clarify the coronary anomaly. The MSCT showed absence of the left main coronary ostium and very thin and smooth proximal part and larger distal part of the LAD and the LCX. Additionally, there was retrograde intercoronary communication of the RCA to the LAD via the conus branch and the LCX via SAN branch and PL branch. Thin-slab maximum intensity projections revealed no left main ostium. Calcium score in Agastston score was at low level of 9 points. Left main atresia was impressed. Thalium 201 perfusion scintigraphy during dipyridamole infusion was done and also showed no perfusion defect. We informed patient of the possibility of cardiac risk, but he refused to receive surgery. He received regular outpatient follow-up with only very mild symptom for one year after diagnosis.

DISCUSSION

Among all cases of anomalous origin and distribution of the coronary arteries, isolated congenital atresia of the left main coronary artery is extremely rare and seldom reported. Congenital atresia of the left coronary ostium should be considered totally different from single (right) coronary artery, even though the RCA supplies the entire coronary circulation in both conditions. Physiologically, coronary ostia atresia s usually associated with ischemic manifestations, whereas single coronary artery is not. These patients are able to survive via congenitally developed collateral circulation from either the conus branch artery (Vieussens’ anastomotic ring) or through the anterior ventricular branches of the RCA or through the terminal ramifications of the posterior descending branch with retrograde flow to the terminal branch of the LAD at the apex of the left ventricle. Chronic left main total occlusion has a similar clinical and angiographic picture in adult patients. However, in true LMCA atresia, the coronary arteries are usually free of other atherosclerotic stenosis and/or calcification; the left-sided arteries have a diminutive cali-
ber, and at surgery, the absence of the left coronary ostium can be confirmed.\(^5\)

Currently, a number of imaging modalities are employed to delineate anomalous coronary arteries. They include conventional coronary angiography, transesophageal echocardiography, transthoracic echocardiography, magnetic resonance imaging, electron-beam computed tomography and multislice computed tomography. MSCT is an accurate diagnostic tool to define the anatomic course and the ostium shape of abnormally branching coronary arteries. It shows superior definition of the ostial origin and proximal part of anomalous coronary branches compared to conventional angiography.\(^6\) Images of MSCT can provide persuasive evidence to support its clinical use as a first-line investigation\(^7\) and aid in diagnosis for patients with suspected congenital coronary artery anomalies.\(^8\) In this case, MSCT could identify the anomalous origins of the coronary artery and coronary artery anatomy, which appeared uncertain from conventional coronary angiography.

REFERENCES

先天性無左主冠狀動脈

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先天性無主冠狀動脈是一種極為少見的冠狀動脈異常，除了無左冠狀動脈開口，左主幹近端無連接，右冠狀動脈血流會經由側枝循環回到至少一條左側冠狀動脈。我們描述一位五十歲男性呈現不典型胸痛但因運動心電圖異常接受冠狀動脈攝影及六十四切電腦斷層攝影清楚顯示無左主冠狀動脈，左前降枝及左迴旋枝之近端變小及明顯的由右冠狀動脈至左側血管的側枝循環，六十四切電腦斷層攝影可以提供對複雜的先天冠狀動脈異常清晰的解剖學影像。

關鍵詞：先天性無主冠狀動脈、六十四切電腦斷層攝影。