

CARDIOVASCULAR IMAGES

A joint publication of the Department of Radiology and Heart Center

New-Onset Chest Pain

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Clinical History

A 48 year-old woman with a history of mitral valve insufficiency presented to the emergency room with a subacute (4 days) chest pain syndrome. The day of admission, she was awakened from sleep with substernal chest pressure which was non-radiating, worsened with exercise and was relieved by rest. She denied difficulty breathing, palpitations, diaphoresis, or syncope. She was referred to Massachusetts General Hospital, where her presenting EKG showed ST-elevations in V2–V3 and T wave inversions in I and aVL. Her presenting biomarkers were unremarkable. She was given aspirin, metoprolol and intravenous heparin and transferred to the Catheterization Laboratory. Cardiac catheterization revealed an occluded left main (LM) coronary artery, with left anterior descending artery (LAD) and left circumflex artery (LCx) filling from the right coronary artery (RCA). No intervention was performed and medical management with aspirin, beta-blockers, HMG CoA reductase inhibitors and ACE-inhibitors was initiated.

Following catheterization, she continued to have episodes of chest pain with associated ST segment depression and T wave inversion in the anterior leads. A symptom-limited perfusion study was suboptimal, but suspicious for reversible anterior wall myocardial ischemia. A decision was made to proceed with cardiac revascularization with a single bypass graft left internal mammary artery (LIMA) to LAD; and a prospectively triggered dual source 64 slice coronary CTA was requested prior to surgical revascularization to further delineate coronary anatomy and mammary arteries.

Findings

Cardiac CTA revealed a short left main with an absent ostium. The RCA was markedly enlarged, and the LAD and LCx were opacified via collateral flow from a right-sided posterior left ventricular branch (PLVB). All three main coronary arteries were free of evidence of epicardial coronary artery disease. This constellation of findings is consistent with congenital left main coronary atresia (LMCA).

Discussion

LMCA is a rare coronary anomaly in which there is no left main ostium, and the proximal left main trunk ends blindly. Blood flows retrograde from the right coronary artery to the left circulation via collaterals. The collateral vessels feeding the left coronary system may include the conal, intraseptal, apical, anterior, and posterior ventricular arteries. Most patients are symptomatic at the time of diagnosis; with syncope, failure to thrive and myocardial infarction being the commonest presentation in the pediatric population. Older patients usually present with complaints of exertional dyspnea or angina in the absence of atherosclerotic disease, and sudden death is a rare presenting symptom. Medical therapy does not appear to be helpful.

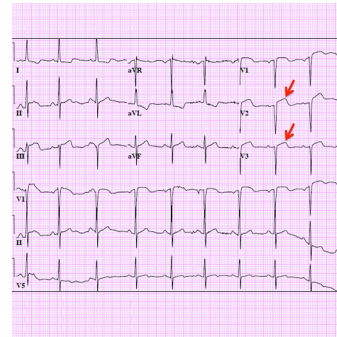


Figure 1

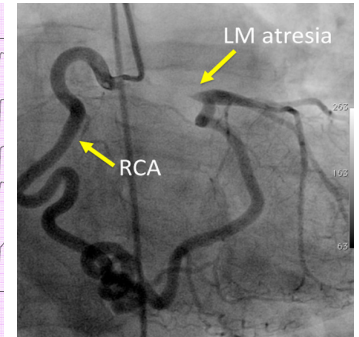


Figure 2

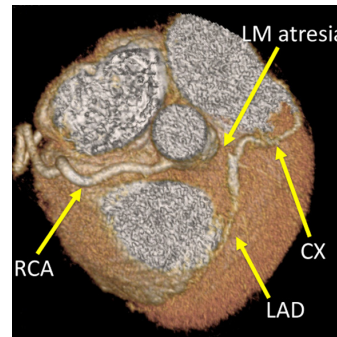


Figure 3

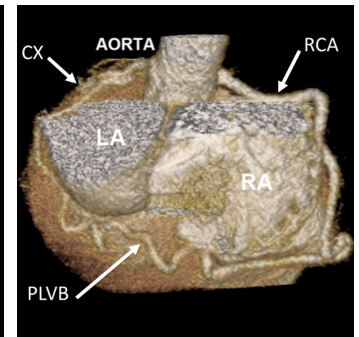


Figure 4

Figure 1. Presenting EKG with ST-T elevation in V2 – V3 (arrows).

Figure 2. CATH: RAO view showing an enlarged RCA with a large terminal PLV branch. The left main appears to be occluded. LM. The LCx and LAD fill with retrograde flow from the PLV branch.

Figure 3. 3D volume rendered CTA showing the LM Atresia.

Figure 4. 3D volume rendered CTA showing an enlarged RCA with a large terminal PLV branch connecting to the LCx.

REFERENCES

- Antonello Musiani et al., "Left main Coronary Artery Atresia: Literature review and therapeutical considerations" *Eur J Cardiothoracic Surg* 11 (1997) 505-514