

CT angiography: Uncovering an unusual diagnosis in the eighth decade

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Case report

A 78-year-old woman with a history of hypertension and dyslipidemia presented to her primary care physician with exertional chest pain that started a few months earlier. Her cardiac examination and electrocardiogram were abnormal. Her cardiac troponin was negative. A stress test was performed, which showed evidence of anteroapical and inferior mild ischemia. To better evaluate her coronary anatomy, 64-slice computed tomography (CT) angiography was performed, as the patient was reluctant to have an invasive coronary angiogram. CT angiography revealed coronary artery disease as well as an incidental diagnosis (**Figure**).

Can you identify the incidental diagnosis?

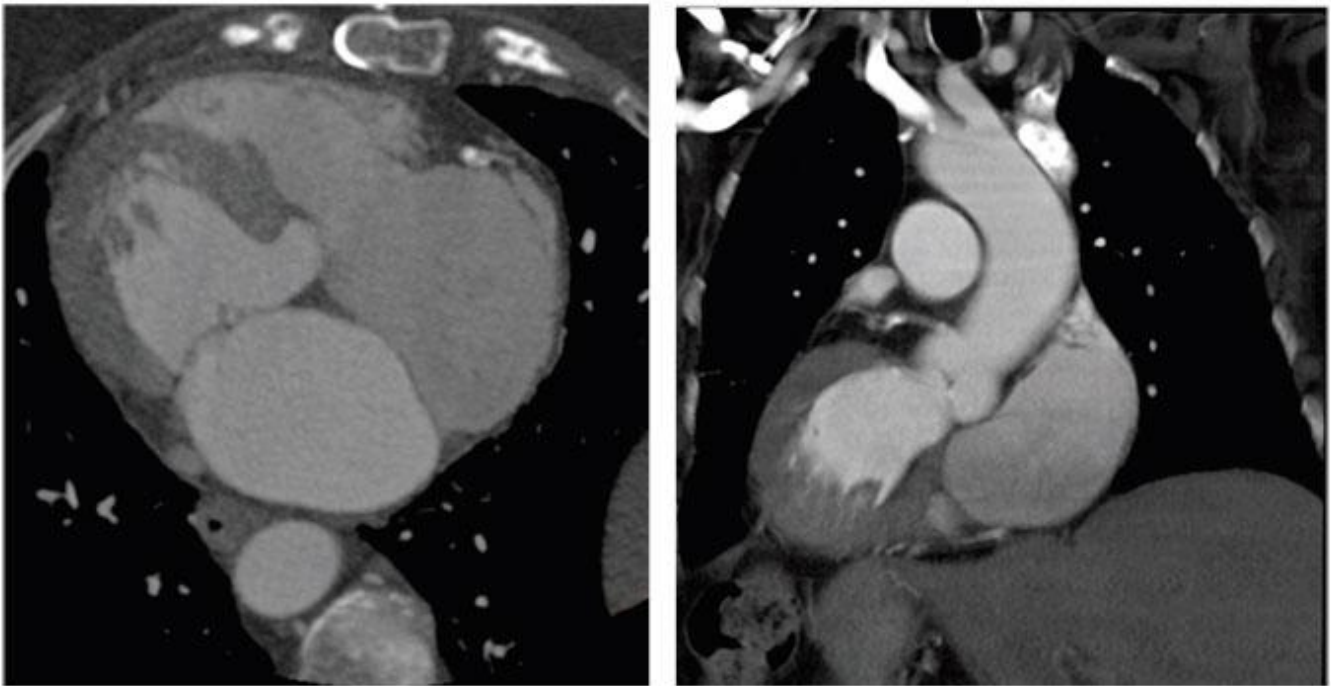


Figure. 64-Slice CT angiography images.

Diagnosis: Situs inversus totalis with dextrocardia.

Situs inversus totalis with dextrocardia is a rare congenital condition in which the major visceral organs are reversed or mirrored from their normal positions and the heart apex is to the right of the thorax. The condition is present in 0.01% of the population, with an equal incidence between the sexes and no racial predilection.¹ Most patients do not have any significant cardiac defects, and their life expectancy is normal, as our patient's case demonstrates.

After the diagnosis was made in our patient (**Figure 1**), she underwent triple bypass surgery to treat her coronary artery disease, including a right (and not left) internal mammary artery graft to the left anterior descending artery (**Figures 2 and 3**). The procedure was successful, and the patient had an

uneventful postoperative recovery.

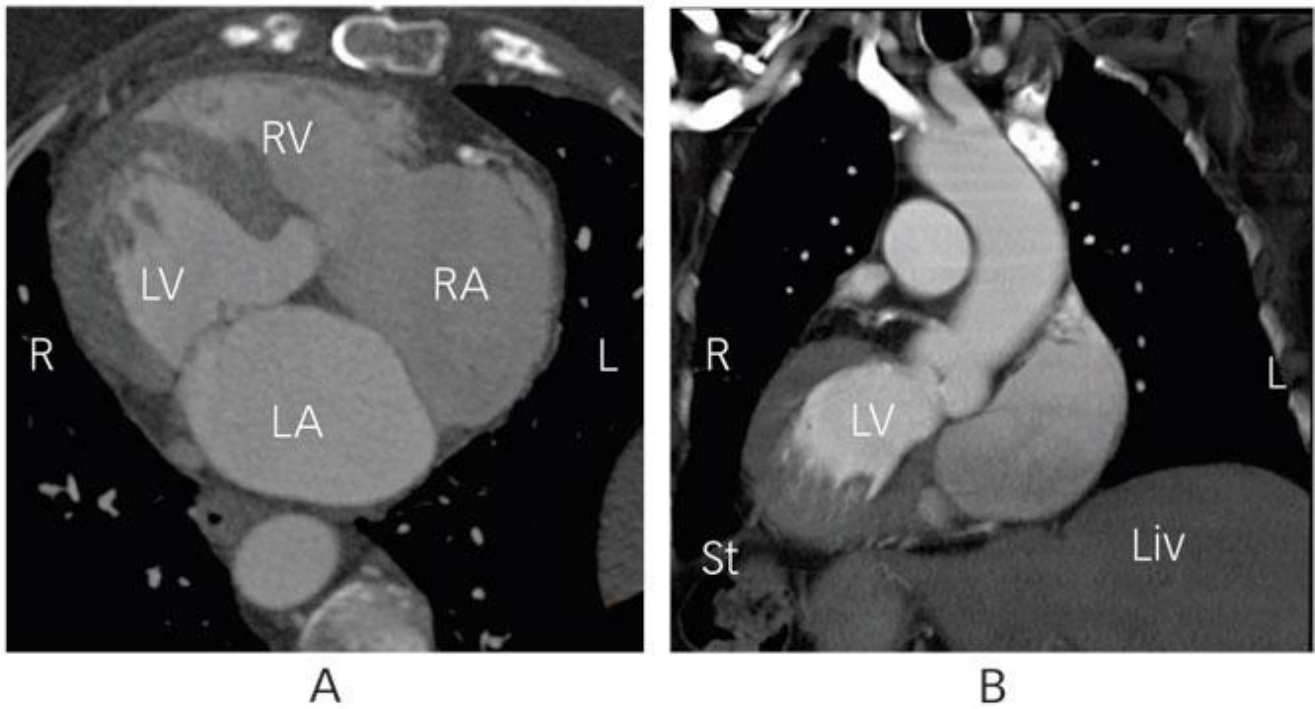


Figure 1. 64-Slice CT angiograms showing situs inversus totalis with dextrocardia (A, coronal view; B, axial view).

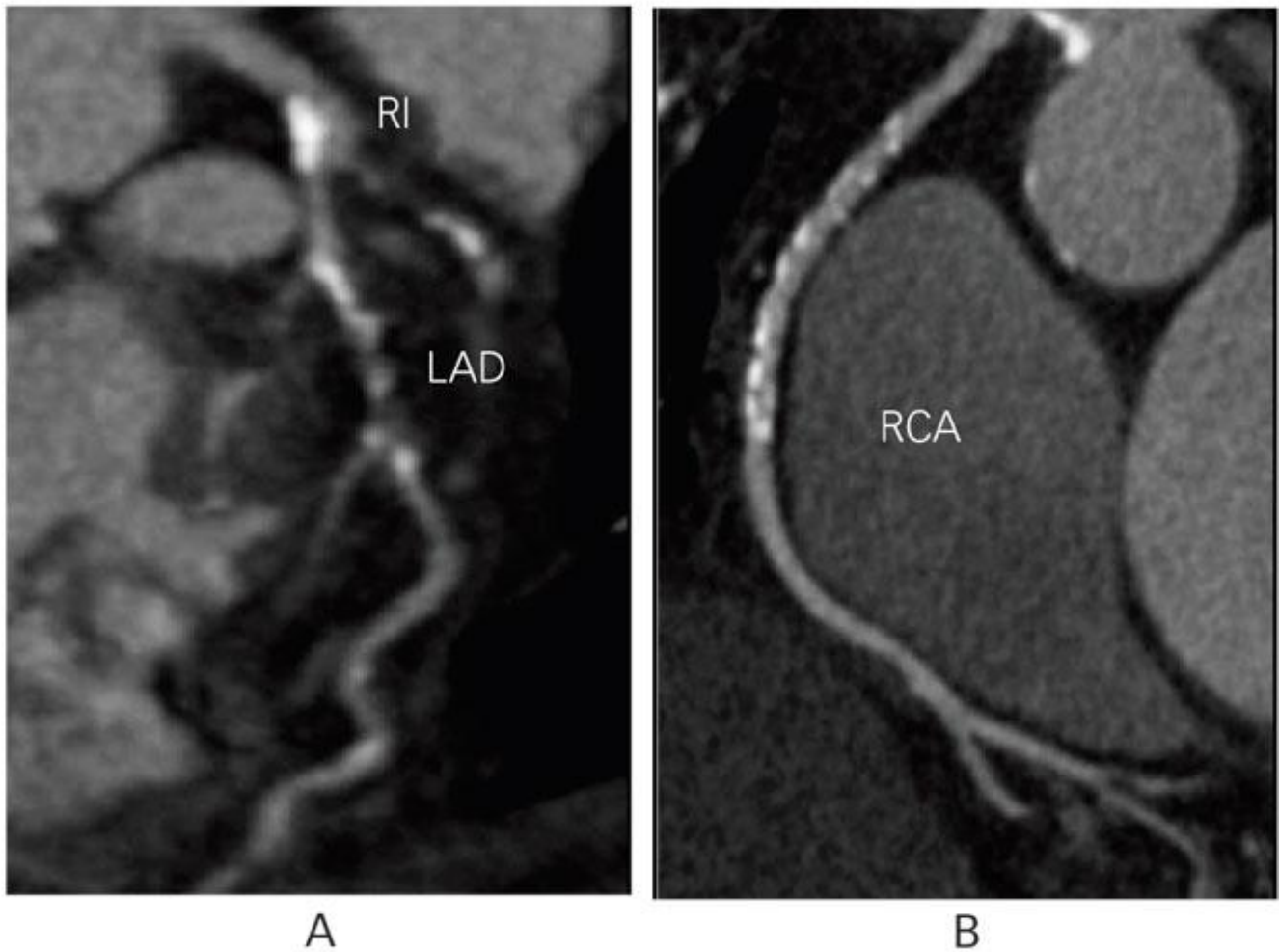


Figure 2. 64-Slice CT angiogram showing severe obstructive disease with noncalcified and calcified plaques in the left anterior descending and ramus intermedius coronary arteries (A). Nonobstructive disease with calcification in the right coronary artery is visible (B).

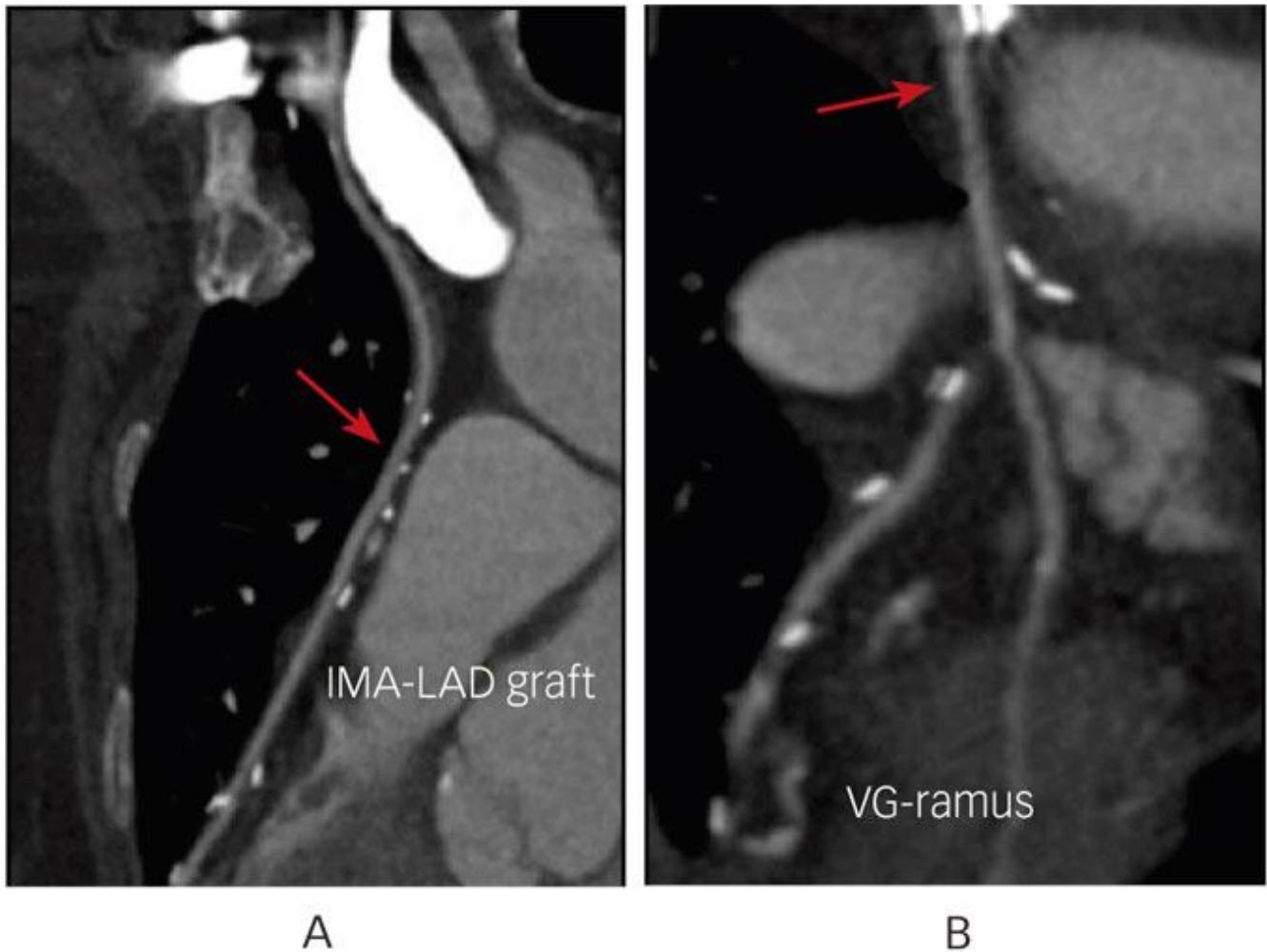


Figure 3. 64-slice CT angiogram showing graft (arrows), right internal mammary artery to the LAD coronary artery (A), and saphenous venous graft to the ramus intermedius branch (B).

The advent of technology such as multislice coronary computed tomography (CT) angiography allows us to accurately evaluate coronary anatomy and to uncover other interesting and sometimes crucial findings, such as situs inversus totalis. Identifying such anatomical anomalies is critical to avoiding diagnostic and surgical mishaps and to ensure electrocardiograms (ECGs) are not misinterpreted. In patients with recognized situs inversus totalis with dextrocardia, misleading ECGs can be minimized by reversing the precordial leads and the right and left arm leads. The P waves, QRS complex, and T waves are all inverted in lead I.² Comparing changes between an old and new ECG may be helpful, and paying close attention to the left and right sides of the patient and the left and right labeling of images helps prevent mistakes in diagnosis and during surgical intervention.

Figure label key

IMA-LAD = internal mammary graft to the left anterior descending coronary artery; L = left; LA = left atrium; LAD = left anterior descending; Liv = liver; LV = left ventricle; R = right; RA = right atrium; RCA = right coronary artery; RI = ramus intermedius; RV = right ventricle; St = stomach;

VG-ramus = venous graft to the ramus inter-medius artery.

References

1. Wilhelm A, Holbert JM. Situs inversus. <http://www.emedicine.com/radio/topic639.htm>. Accessed November 24, 2008.
2. Wagner GS. *Marriott's Practical Electrocardiography*. 9th ed. Baltimore, MD: Williams and Wilkins; 1994.