Intra-atrial course of the right coronary artery: depiction of a potentially hazardous entity on dual-source CT

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DESCRIPTION

A 45-year-old man presented in the outpatient clinic with occasional atypical chest pain. ECG was normal, and echocardiography did not reveal any wall motion abnormality. The patient was referred to us for CT angiography (CTA) to rule out coronary artery disease. The CTA, done on 192(×2)-slice dual source scanner (Siemens SOMATOM Force) revealed intracavitary course of the mid-segment of the right coronary artery (RCA) within the right atrium (RA) (figure 1A, arrow) for a length of 4.5 cm with a normal epicardial course of the rest of the RCA (figure 1B, asterisk and figure 2A–C). There was no significant coronary artery stenosis.

Anomalous intracavitary coronary arteries were first described by McAlpine in 1975.¹ Previously considered to be extremely rare abnormality, it is increasingly being recognised as a commoner entity with advent of CT. A recent study evaluating 7847 coronary CTA studies estimated the prevalence of intracavitary RCA to be 0.36%.² Though this incidentally detected anomaly seems to be unrelated to our patient's chest pain, it is important to know about this entity before various interventions. The procedures which put the intracavitary RCA under risk of inadvertent damage include: (1) those requiring catheter manipulation in RA such as angiography, central venous catheter and pacemaker placement; (2) electrophysiological studies—during electrode placement, trans-septal puncture for LA access, RF ablation of arrhythmias; (3) CABG—during coronary localisation and grafting; (4) open heart surgery—during IVC/coronary sinus cannulation, dissection of target vessel

Figure 2 True cross-sectional images of the RCA at (A) proximal to the intra-atrial segment showing the RCA completely surrounded by epicardial fat. (B) At the level of arrow in 1B showing RCA entering into the right atrium (RA) and (C) intra-atrial segment of RCA which is surrounded by blood in RA.

and so on. CTA proves to be extremely helpful to forewarn the interventionist/surgeon of the presence of this entity before planning such procedures to avoid catastrophic damage to the coronary artery, thereby preventing myocardial ischaemia on table.³

Learning points

- ▶ Intra-atrial course of the right coronary artery (RCA) is a rare variant anomaly.
- ▶ This anomalous course of the RCA puts it at risk during cardiac interventions and can result in myocardial ischaemia on table.
- ▶ It is imperative for the radiologist to diagnose and document this on the report so that necessary precautions can be taken during interventional procedures or during surgery.

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Figure 1 (A) Axial CT image showing the intra-atrial course of the right coronary artery (RCA) (arrow). (B) Curved multiplanar image showing the proximal RCA surrounded by epicardial fat (asterisk), the intra-atrial course of mid RCA for 4.5 cm (arrow) and the normal epicardial course of distal RCA branches (bent arrow).

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