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An Unexpected Intracardiac Echocardiography Finding on the Cavotricuspid Isthmus

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A 60-year-old male was referred for catheter ablation of symptomatic paroxysmal atrial fibrillation. The patient had a history of remote myocardial infarction presenting with cardiogenic shock and requiring emergent 4-vessel coronary artery bypass grafting, including a saphenous vein graft to the right coronary artery (RCA). Although he had no clinical history of atrial flutter, typical counterclockwise atrial flutter involving the cavotricuspid isthmus (CTI) was induced with atrial burst pacing after successful pulmonary vein isolation.

Phased array intracardiac echocardiography (ICE) of the CTI (Fig. 1) showed a large vessel (arrow) protruding into the right atrial lumen on both the medial (panel A) and lateral (panel B) aspects of the CTI. This vessel was distinct from the coronary sinus (not shown), which was visualized in a more posterior plane with the decapolar diagnostic catheter seen entering its lumen. The atrial flutter terminated with just catheter pressure on the CTI at the location of this larger vessel, suggesting that slow conduction through the thin scarred atrial myocardium overlying this vessel likely predisposed to the inducibility of typical atrial flutter. During biplane coronary angiography, this vessel was confirmed to be the vein graft to the RCA (Fig. 1, panels C and D) with the ablation catheter (arrowhead) directly overlying the vessel, as seen also in the ICE images (panel B). Considering the possible adverse consequences of CTI ablation in this patient, we elected to defer ablation of the CTI.

It is known that the RCA can be located somewhat superficial on the CTI, and that RCA injury is possible but uncommon during CTI ablation; however, this patient demonstrates that large vulnerable vein grafts may be even more superficial on the CTI, but easily visualized with phased array ICE prior to ablation. This case also highlights the usefulness of phased array ICE as an important procedural tool in patients like this one to prevent graft injury, which could have been devastating for him considering the prior history of shock. Fortunately, this patient subsequently did well in follow-up without any clinical atrial flutter, indicating that nonclinical atrial flutters associated with this anatomy may not always require ablation.

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Figure 1.

Intracardiac echocardiography images (panels A and B) show the vein graft to the right coronary artery (arrow) protruding into the right atrium from the surface of the cavotricuspid isthmus with the shadow of the ablation catheter overlying (arrowhead). Right and left anterior oblique fluoroscopic views (panels C and D) of the right coronary artery and vein graft are shown with the ablation catheter directly over the vein graft in both views.