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# Transient coronary artery dissection analysed with optical coherence tomography during radiofrequency catheter ablation

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**ESC curriculum** 5.6 Ventricular arrhythmia • 3.2 Acute coronary syndrome • 3.4 Coronary angiography

## Case description

A 70-year-old male underwent catheter ablation of symptomatic premature ventricular complexes (PVC) characterized by an inferior axis and right bundle branch block morphology. A pre-ablation coronary angiogram (CAG) revealed mild stenosis in the proximal left circumflex artery (LCx) (*Figure 1A*, red arrowheads). Employing a 3.3 Fr icosapolar electrode catheter, the local electrogram recorded inside the great cardiac vein (GCV) preceded the onset of the QRS by 18 ms, where a perfect pacemap (pacemap score of 98%) was obtained (*Figure 1B*). Despite a radiofrequency energy delivery on the left ventricular endocardium facing the GCV site, the PVC persisted. Subsequently, ablation within the GCV was attempted, with a power escalating from 15 to 25 W and a maximum temperature of 42°C (*Figure 1C*, red tags). During the ablation, the patient reported sudden chest discomfort, accompanied by ST-segment depression in the inferior wall leads on the ECG. A CAG showed a 90% stenosis of the proximal LCx (*Figure 1D*). Optical coherence tomography (OCT) delineated marked intimal thickening (*Figure 1E*, white arrows) and a coronary dissection (*Figure 1F*, white arrowheads). We suspected that direct trauma or thermal injury may have led to the development of intimal oedema and the subsequent rupture of the established coronary artery atherosclerosis. Given the maintained coronary blood flow, the procedure was finished without any intervention. The patient was discharged without further coronary events, and a follow-up CAG at 6 months demonstrated regression of the lesion to mild stenosis, with the disappearance of the intimal dissection (*Figure 1G* to *I*). The patient has remained free from PVCs without any anti-arrhythmic drugs for 6 months.

The aetiology of acute coronary injury encompasses vasospasm-related coronary occlusions, coronary dissections, or plaque ruptures.[1] A systematic literature review by Pothineni *et al.*[2] revealed that stent placement for coronary artery injury was required in 32.7% of cases. To the best of our knowledge, this study represents the first documentation of delineating an iatrogenic coronary artery injury, characterized by intimal thickening and a dissection from high-resolution OCT images. It is noteworthy that the observed dissection spontaneously resolved during the post-ablation follow-up, precluding the need for any additional coronary intervention. In similar cases, we speculate that high-output and short-duration ablation techniques could potentially mitigate collateral damage.[3]

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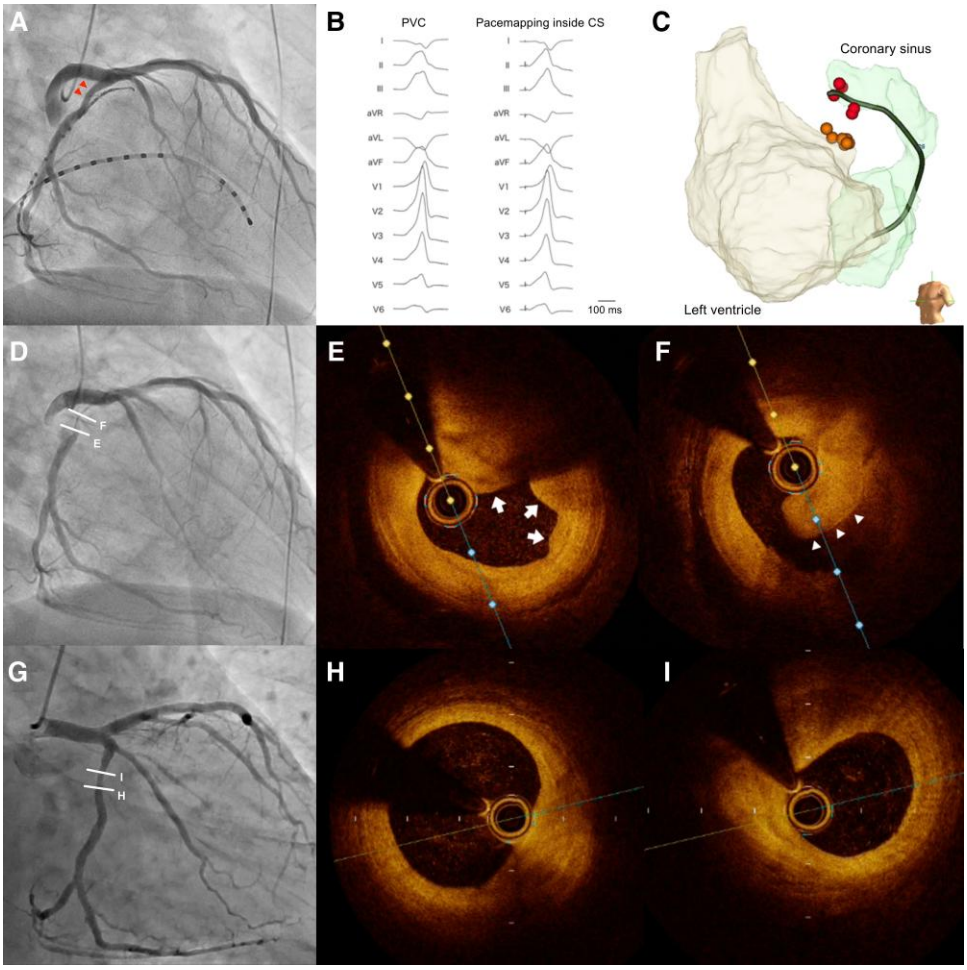


**Figure 1** (*A*) Pre-ablation CAG. (*B*) The 12-lead electrocardiogram of the clinical PVC and paced morphology inside distal GCV. (*C*) A three-dimensional electroanatomical mapping system delineated the anatomy of the left ventricle and the coronary sinus in the left anterior oblique view. Ablation sites inside the left ventricle and the distal GCV were tagged in the 3D mapping system. (*D–F*) Coronary angiogram and OCT imaging revealed an acute coronary stenosis. (*G–I*) Follow-up CAG and OCT at 6 months after the procedure. CAG, coronary angiogram; GCV, great cardiac vein; OCT, optical coherence tomography; PVC, premature ventricular complex.

**Consent:** The authors confirm that written consent for the submission and publication of this case has been obtained from the patient in line with the Committee on Publication Ethics (COPE) guidance.

**Conflict of interest:** Y.K. has received honoraria for lectures and advisory board activities from Johnson & Johnson.

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## Data availability

All data generated or analysed during this study are included in this published article.

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