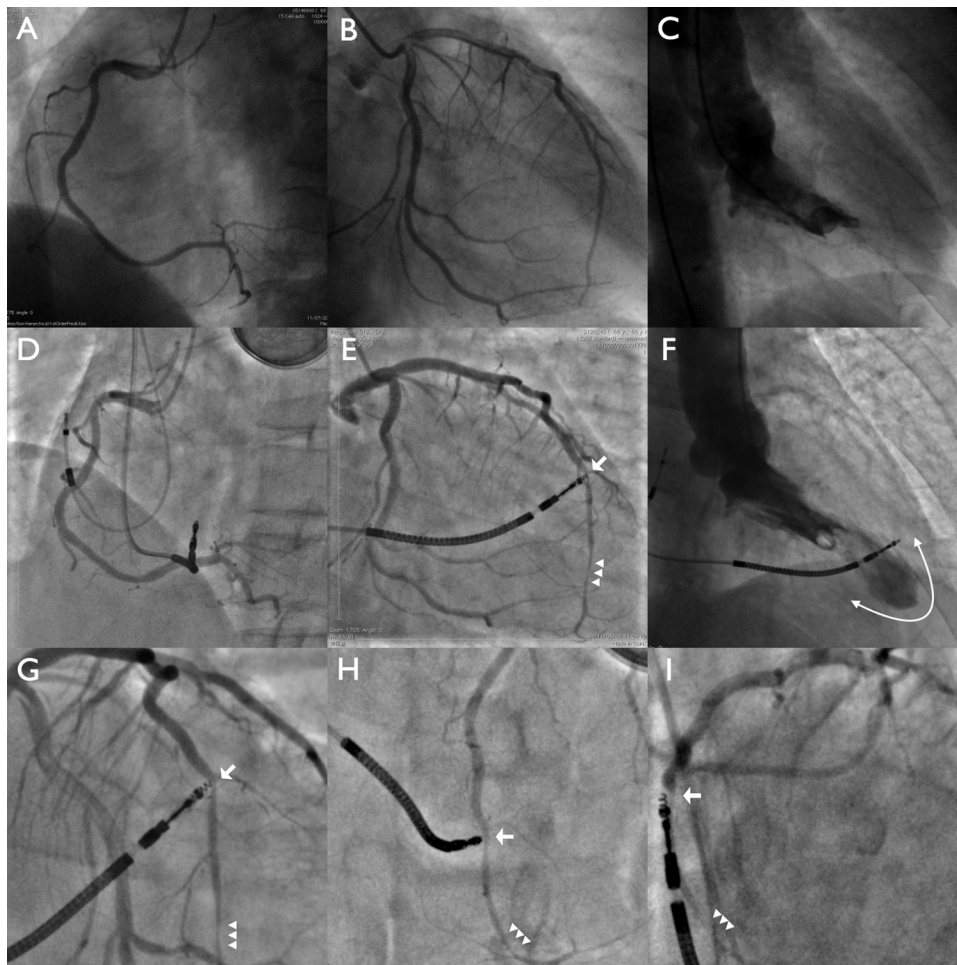


## Implantation of the Right Ventricular Lead of an Implantable Cardioverter-Defibrillator Complicated by Apical Myocardial Infarction

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A 68-year-old man who experienced ventricular fibrillation triggered by a vasospastic angina (VSA) was resuscitated by a lay-rescuer with an automated external defibrillator. He had been diagnosed with VSA on the basis of

chest pain while at rest in the early morning, which had been treated successfully with nitrates and calcium channel blockers for 13 years. During hospitalization after the patient was resuscitated, he had VSA with ST elevation in the inferior



**Figure 1.** Preoperative (A through C) and postoperative (D through I) coronary angiography and left ventriculography are shown. A and D, left anterior oblique (LAO) view of the right coronary artery. B and E, right anterior oblique (RAO) view of the left coronary artery. C and F, RAO view of the left ventriculography. RAO caudal view (G), LAO cranial view (H), and LAO caudal view (I) of the left coronary artery. Preoperative coronary angiography and left ventriculography showed no abnormal findings (A through C). Postoperative images (D through I) revealed that the tip of the screw-in lead was almost touching the left anterior descending artery and that there was vaso-spasm (arrows and arrowheads) and an apical aneurysm (2-headed arrow in F).

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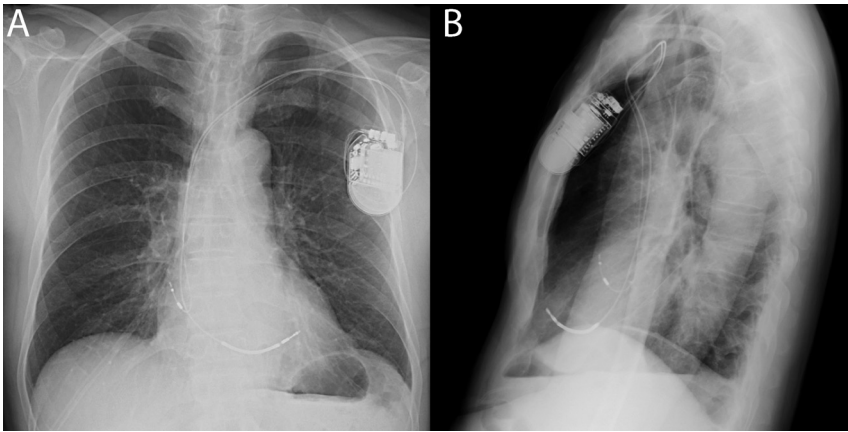
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**Figure 2.** Posteroanterior view (A) and the lateral view (B) of the postoperative chest radiograph.

leads after cessation of both medications. Ultrasound echocardiography showed no abnormal findings after the episode of VSA. The coronary angiograph and the left ventriculograph revealed the absence of both significant coronary stenosis and segmental asynergy (Figure 1A through 1C).

A dual-chamber implantable cardioverter-defibrillator was implanted to avoid the risk of sudden cardiac death. A screw-in ventricular lead (model 7122Q, St. Jude Medical, St. Paul, MN) was placed in the anterior septum of the right ventricular apex, and a screw-in atrial lead (model 4472, Boston Scientific, Natick, MA) was placed in the right atrial appendage. At implantation, the atrial and ventricular lead parameters were functioning normally (atrial sense, 2.4 mV, ventricular sense, 11.3 mV; atrial pacing threshold, 0.75 V/0.5 ms, ventricular pacing threshold, 0.75 V/0.5 ms; atrial impedance, 440 ohm, ventricular impedance, 630 ohm). A postoperative chest radiograph was obtained (Figure 2A and 2B). The electrocardiograph taken during the immediate postoperative period was unchanged compared with the preoperative electrocardiograph.

On postoperative day 1, ST elevation in the inferior and precordial leads occurred without chest pain. The lead parameters remained normal. Continuous infusion of nitrates was started. On postoperative day 2, ST elevation without symptoms persisted, but there was newly diagnosed elevation of cardiac enzymes (maximum creatine kinase, 2918 IU/L).

Ultrasound echocardiography revealed asynergy of the distal left anterior descending artery (LAD), which we diagnosed as a myocardial infarction that possibly was caused by coronary spasm. On postoperative day 3, because of intractable VSA, coronary angiography and left ventriculography were performed to rule out new coronary stenosis; it was revealed that the tip of the right ventricular screw-in lead was positioned just underneath the LAD, causing 75% stenosis of the LAD at the tip of the ventricular lead and 99% stenosis of the distal LAD due to spasm, and there was asynergy of the apex (Figure 1D through 1I). The amplitude of the electrogram of the right ventricular lead was decreased to 2.3 mV, and the pacing threshold was increased to 4.0 V/0.5 ms. We repositioned the ventricular lead away from the LAD without any further complications, and the subsequent clinical course was uneventful. Although a rare occurrence, an endocardially implanted right ventricular implantable cardioverter-defibrillator screw-in lead can be positioned close to the LAD and can cause vasospasm proceeded by myocardial infarction. Movies of the coronary angiograph and left ventriculograph before and after the implantable cardioverter-defibrillator implantation are provided in the online-only Data Supplement.

## Disclosures

None.

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