

IMAGES IN INTERVENTION

A Rare Case of Late Extraluminal Migration of a Drug-Eluting Stent Across the Right Coronary Artery Partially Into the Pericardial Sac in the Right Atrioventricular Groove With Complete In-Stent Thrombosis



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A 59-year-old man with diabetes presented with exertional dyspnea and angina for 3 months. He had a history of inferior wall myocardial infarction 9 months previously, with percutaneous intervention of an 80% tubular lesion of the mid-right coronary artery (RCA) with a 3.5 × 28 mm drug eluting stent (PROMUS Element, Boston Scientific, Natick, Massachusetts) (Figures 1A and 1B). Six months previously, he was admitted to another hospital with chest pain following blunt chest trauma and was diagnosed with non-ST-segment elevation myocardial infarction. He was initially stabilized medically, and later coronary angiography revealed 100% in-stent thrombosis with no distal flow (Figure 1C). He was advised to undergo reintervention but refused and continued medical therapy.

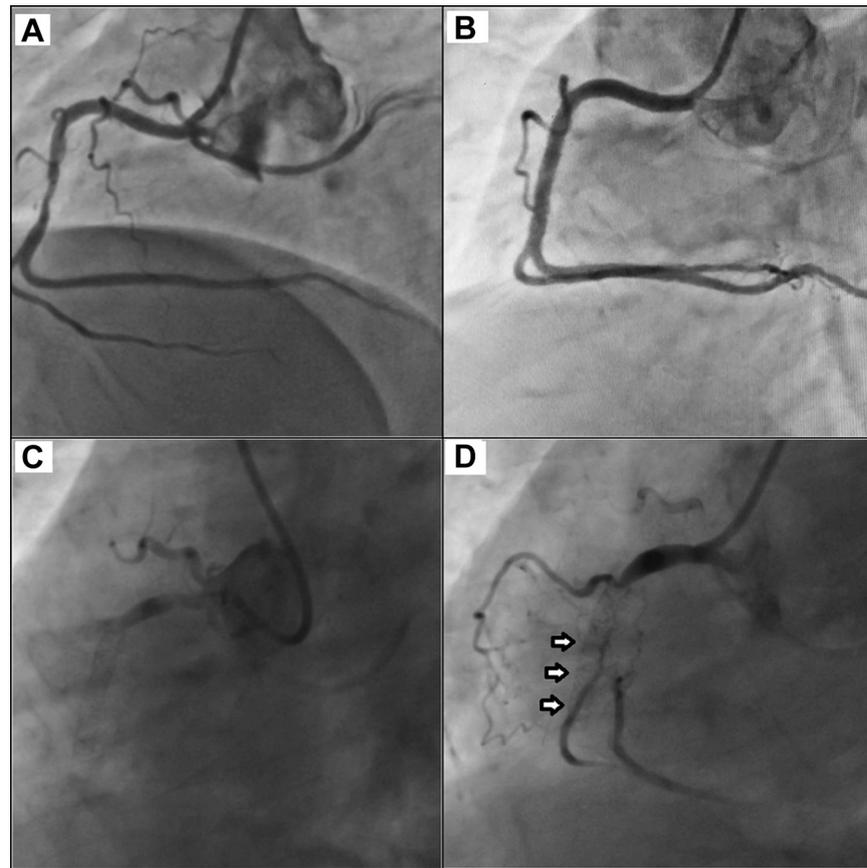
At our institution, 2-dimensional echocardiography revealed an unusual echogenic structure in the right atrioventricular groove in the apical 4-chamber view (Figure 2A). The patient was suspected to have stent infection or abscess. Cardiac magnetic resonance imaging was done and showed low signal area reflecting the stent, surrounded by abnormal,

ill-defined soft tissue extending along the atrioventricular groove in the course of the RCA, suggestive of either stent infection or stent migration with pericardial thickening (Figure 2B). However, the patient had no history of fever, his blood counts were normal, and later his blood cultures revealed no growth.

Further evaluation with cardiac CT (Figures 2C, 2D, and 3A to 3D) revealed nonopacification of a 1.5-cm segment of the mid-RCA beyond the first genu. The stent in the mid-RCA appeared to have migrated or displaced across the wall of the RCA and was now located in the right atrioventricular groove with complete in-stent thrombosis. Irregular perifocal localized pericardial fluid collection and soft tissue thickening were seen surrounding it. The distal RCA was normal in course and caliber. Other coronary arteries revealed minor plaques, with anomalous origin of the left circumflex coronary artery. Coronary angiography also revealed proximal in-stent total occlusion with antegrade filling of the distal RCA through intracoronary collateral vessels, with loss of normal alignment of the stent along the vessel course, indicating stent migration (Figure 1D).

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FIGURE 1 Conventional Coronary Angiographic Images

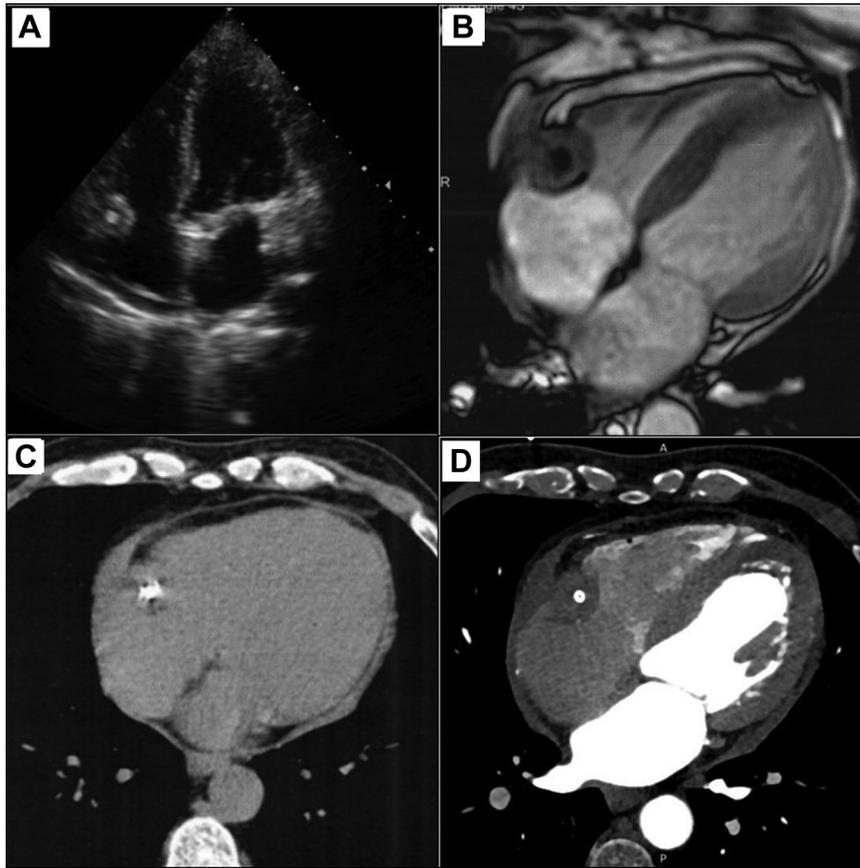
(A) First coronary angiogram obtained 9 months previously, showing 80% tubular mid-right coronary artery (RCA) stenosis. (B) Coronary angioplasty cine image obtained 9 months previously, showing 3.5 × 28 mm drug-eluting stent (PROMUS Element) in the mid-RCA with TIMI (Thrombolysis In Myocardial Infarction) grade 3 flow distally. (C) Second coronary angiogram obtained 6 months previously, showing 100% proximal in-stent thrombosis with no distal flow. (D) Third coronary angiogram obtained at our institution, showing antegrade filling of the distal RCA through intracoronary collateral vessels and loss of normal alignment of stent (indicated by arrows) along the RCA course, indicating stent migration.

No viable tissue in the RCA territory was seen on cardiac magnetic resonance imaging, and hence further intervention to salvage the RCA supply was deferred. Because of late presentation, the exact cause of stent migration could not be ascertained. However, 6 months before presenting to our facility, the patient had experienced blunt chest trauma, which although rare is known to cause coronary artery dissection with acute myocardial infarction or coronary perforation with tamponade (1,2). The cause of the unusual stent migration in our case can be hypothesized to be medial wall injury with dissection

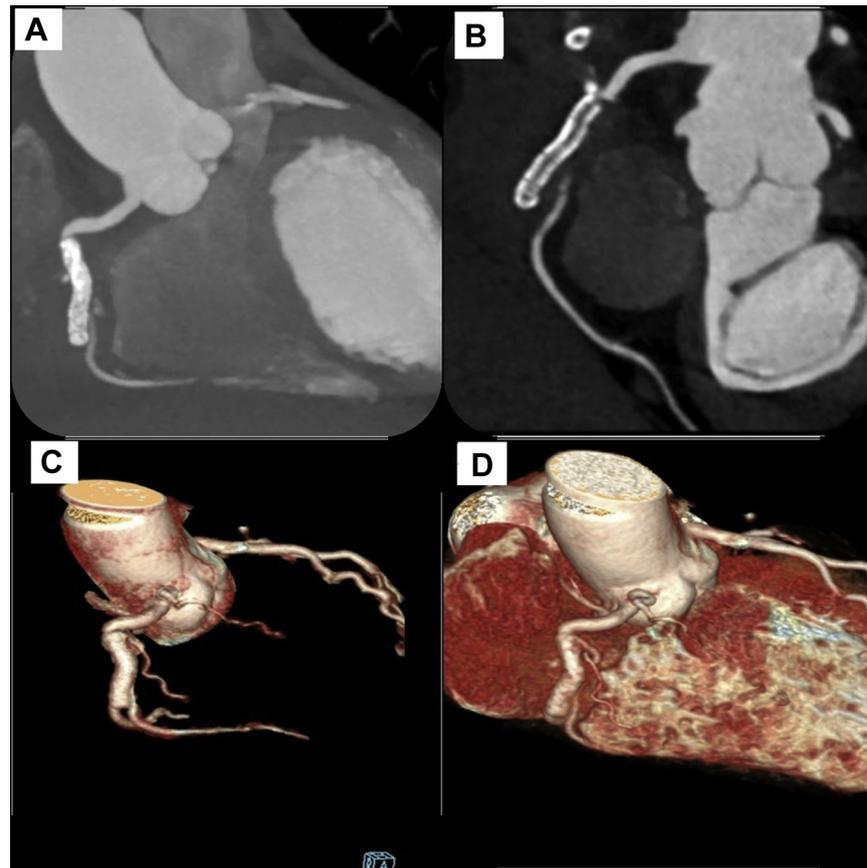
secondary to blunt chest trauma followed by subsequent complications such as slow vessel perforation with secondary stent thrombosis (3). Stent thrombosis might have prevented the formation of hemopericardium that usually occurs after vessel rupture.

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FIGURE 2 Various Imaging Modalities Used to Diagnose Stent Migration



(A) Apical 4-chamber view on 2-dimensional echocardiography showing abnormal echogenicity in the right atrioventricular groove. **(B)** Cardiac magnetic resonance imaging showing low signal area reflecting the right coronary artery (RCA) stent, surrounded by abnormal, ill-defined soft tissue in the right atrioventricular groove. **(C)** Plain cardiac computed tomography (CT) showing RCA stent in the right atrioventricular groove. **(D)** Contrast-enhanced cardiac CT showing nonopacification of RCA stent with irregular perifocal localized pericardial fluid collection and soft tissue thickening.

FIGURE 3 Cardiac Computed Tomographic Images Demonstrating Stent Migration

(A,B) Contrast-enhanced cardiac computed tomographic images and (C,D) 3-dimensional reconstructed images showing nonopacification of a 1.5-cm segment of the mid-right coronary artery (RCA) beyond the first genu. The stent in the mid-RCA appears to have migrated or displaced across the wall of RCA and is now located in the right atrioventricular groove, with complete in-stent occlusion. The distal RCA appears normal in course and caliber. The posterior descending artery and posterolateral vessel appear normal.

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