

Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION



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Circulation 2006;113:e669-e671

DOI: 10.1161/CIRCULATIONAHA.105.557348

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75214

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Acute Myocardial Infarction Caused by Extension of a Proximal Aortic Dissection Flap Into the Right Coronary Artery An Intracoronary Ultrasound Image

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A 69-year-old man with a history of hypertension was referred to our institution for management of acute myocardial infarction (AMI) and cardiogenic shock. The ECG showed a marked ST-segment elevation in leads II, III, and aVF and a reciprocal ST-segment depression in leads V2 through V6, suggesting an inferior wall AMI (Figure 1). Immediately after admission, the patient went into sudden cardiac and respiratory arrest and received cardiopulmonary resuscitation (CPR). A temporary pacemaker and an intra-aortic balloon pump were inserted during the CPR procedure, and emergent coronary angiography was performed. The right coronary angiogram showed no obvious narrowing during the early injection period. During the late injection period, however, we observed a fluctuating dissection flap obliterating the middle portion of the right coronary artery (RCA) and delayed contrast dye clearance beyond this portion, suggesting a flow-limiting dissection flap in the mid-RCA (Figure 2 and Movie I in the online-only Data Supplement). Although the mid-RCA dissection flap seemed to be localized according to the coronary angiography images, an intravascular ultrasound (IVUS) examination re-

vealed a long dissection flap from the ostium of the RCA extending into the middle portion of the RCA (Figure 3 and Movie II), suggesting extension of a proximal aortic dissection (AD) into the RCA. Intra-aortic balloon pumping was stopped, and direct stenting of the RCA was performed. Soon after stenting, the patient recovered sinus rhythm, and his systolic blood pressure rose to 75 mm Hg. Transthoracic and transesophageal echocardiography (Movie III) confirmed the diagnosis of a proximal AD with aortic regurgitation, and he underwent definitive surgical repair of the AD. Intraoperative photographs clearly revealed dissection of the RCA (Figure 4). Direct extension of a dissecting flap into the coronary arteries and subsequent coronary malperfusion are one of the mechanisms of AMI associated with proximal AD. AMI due to direct extension of a proximal AD flap is a fatal condition that can be promptly diagnosed by IVUS, as demonstrated in this case, and direct stenting of the coronary dissecting flap may be an optional bridge approach to earn time for critical unstable patients before definitive surgery.

Disclosures

None.

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The online-only Data Supplement can be found at <http://circ.ahajournals.org/cgi/content/full/113/13/e669/DC1>.

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(*Circulation*. 2006;113:e669-e671.)

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Circulation is available at <http://www.circulationaha.org>

DOI: 10.1161/CIRCULATIONAHA.105.557348

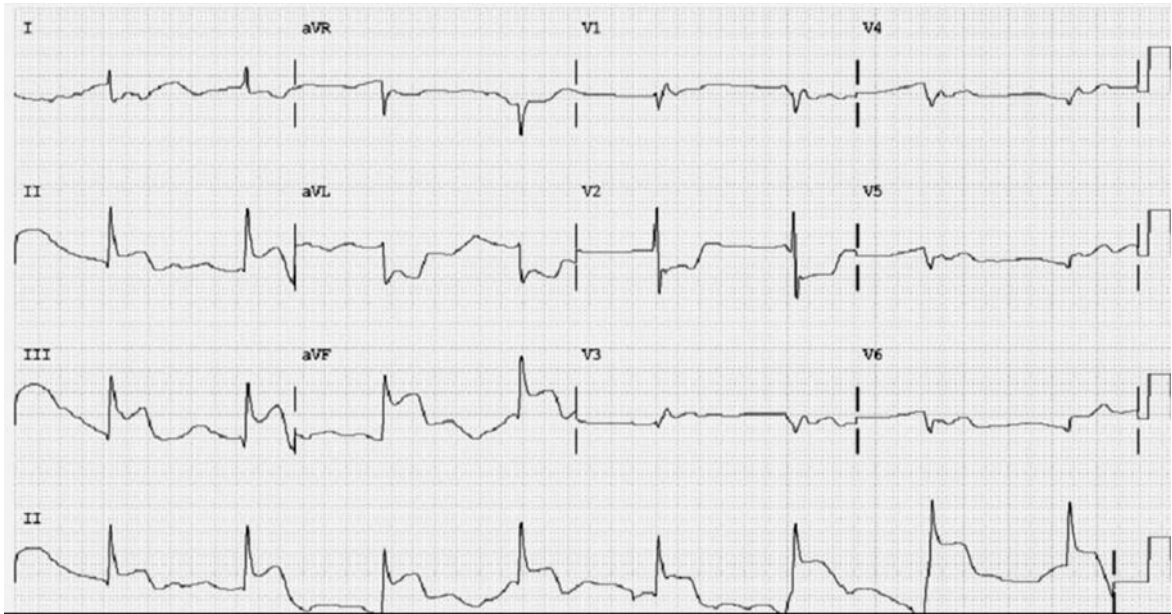


Figure 1. Twelve-lead ECG at admission shows a marked ST-segment elevation in leads II, III, and aVF and reciprocal ST-segment depression in leads V2 through V6, suggesting an inferior wall AMI. There were no definite P waves, suggesting junctional bradycardia.

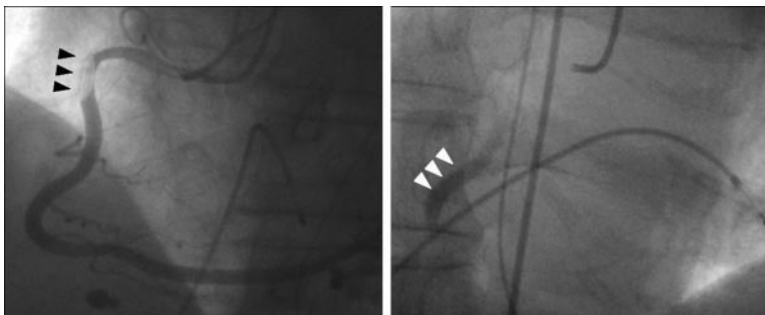


Figure 2. RCA angiogram shows a dissection flap (black arrowheads) in the middle portion, and contrast dye stasis after angiography represents flow limitation caused by the dissection flap (white arrowheads).

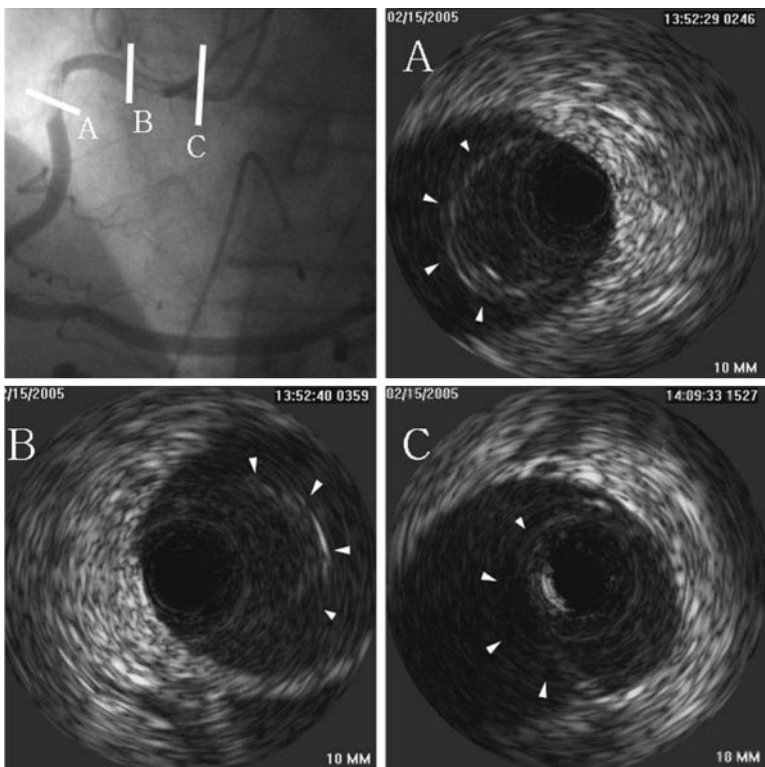


Figure 3. In contrast to the angiogram, in which the dissection flap seemed to be localized, IVUS examination reveals an extensive, large dissection flap (arrowheads) from the middle to the ostial portion of the RCA (A, B, and C).

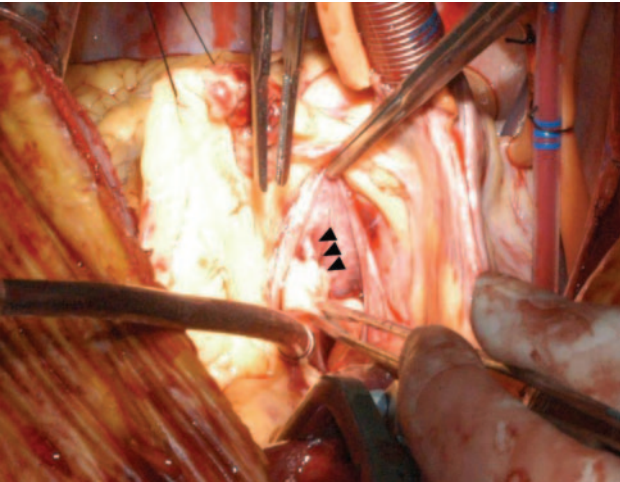


Figure 4. Intraoperative photograph shows dissection of the RCA (arrowheads).