Thromboaspiration Leading to Complete Coronary Artery Stripping in Acute Myocardial Infarction After Blast Injury

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A 54-year-old man without medical history was admitted in our hospital with hemorrhagic shock caused by left compressive hemothorax (Figure 1) after a suicidal gunshot. The entrance site of the projectile was in the 4th left intercostal space.

Surgical exploration performed within the 1st hour revealed dissection of the left internal mammary artery and multiple injuries of the lung parenchyma, which could be successfully repaired. Extensive superficial epicardial dilacerations were observed at the level of the mid left anterior descending coronary artery, without penetrating myocardial or coronary artery injury and without pericardial effusion. Coronary flow appeared to be preserved.

On transfer into the intensive care unit of the sedated and mechanically ventilated patient, routine 12-lead ECG showed signs of anterior acute myocardial infarction (Figure 2). Coronary angiography performed in emergency found an occlusion of the first diagonal artery, without significant lesions of other arteries (Figure 3). The angiographic aspect was compatible with thrombotic occlusion without obvious signs of dissection. Intracoronary thrombectomy using the Export aspiration catheter (6F, Medtronic CardioVascular, Santa Rosa, Calif) surprisingly retrieved the complete wall (length: 25 mm) of the diagonal artery (Figure 4). At the control angiogram, the orifice of the bed of the 1st diagonal artery remained occluded. After balloon angioplasty, TIMI 2 flow was obtained without residual stenosis (Figure 5). Histological analysis of the formalin-embedded diagonal artery showed intact media and intima without adventice (Figure 6). Serial cuts did not show any atheromatic coronary lesions.

During follow-up, peak troponin I level was 17.5 ng/mL (normal <0.1 ng/mL) and transthoracic echocardiography showed anterior hypokinesia with preserved global systolic left ventricular function and no pericardial effusion. Clinical evolution was favorable: The patient was extubated after 17 days, discharged from the intensive care unit after 20 days, and transferred to the psychiatric department at 30 days of hospitalization.

To the best of our knowledge, this is the first description of total occlusive coronary dissection caused by a ballistic pressure wave. Because of high suction pressure, the thrombectomy device in contact with the dissected wall had induced a stripping of the intima-media layer. This case highlights the importance of repeated routine ECG in unconscious patients in the initial phase after thoracic blast injury to detect MI development. On the other hand, it raises the question about the use of thrombectomy devices in this setting, and more generally, about the appropriate therapeutic attitude in the case of coronary occlusion after blast injury.

Restoring coronary flow could limit myocardial necrosis in our patient, as reflected by low peak troponin and preserved left ventricular systolic function, at the cost of a complete endarterectomy of the 1st diagonal by aspiration by the Export device. This complication was all the more surprising because coronary dissection caused by thrombectomy is not reported.1 Coronary occlusion after chest trauma presents particular diagnostic problems because disruption of a preex-
isting atherosclerotic plaque with subsequent thrombosis remains a plausible etiology.² In our patient, histological analysis did not reveal any abnormality of the stripped arterial wall, indicating that dissection occurred in a healthy vessel. In this specific case, use of the thrombectomy device was deleterious. Balloon angioplasty without thromboaspiration might have restored coronary flow, and stripping of the diagonal artery could have been avoided. Our case demonstrates the diagnostic difficulty to identify the underlying mechanism of coronary dissection after blast injury and to determine the appropriate therapeutic attitude in this emergency situation.

Disclosures
None.

References

Key Words: acute myocardial infarction □ angiography □ coronary dissection □ thrombus aspiration

Figure 2. Twelve-lead ECG shows anterior ST-elevation–myocardial infarction.

Figure 3. Diagnostic coronary angiogram shows occlusion of the first diagonal.

Figure 4. Macroscopic aspect of the retrieved material with the Export device.
Figure 5. Coronary angiogram after balloon angioplasty of the first diagonal.

Figure 6. A, Histological section of the retrieved artery shows the intact intima-media layer (hematoxylin and eosin stain); B, ocreine coloration shows the internal elastic lamina.
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_Circ Cardiovasc Interv._ 2010;3:e19-e21
doi: 10.1161/CIRCINTERVENTIONS.110.957159
_Circulation: Cardiovascular Interventions_ is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 1941-7640. Online ISSN: 1941-7632

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