Onset and progression of fatal coronary dissection during angiography

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Coronary angiography was performed in a 43-year-old man admitted to hospital for chest pain. The first frames after the injection of contrast medium showed plaque in the left main coronary artery and subtotal stenosis of the mid-left anterior descending coronary artery. Dissection of the left main coronary artery appeared, with intimal flaps at the proximal segment of the main trunk and the origin of the left anterior descending artery. Dissection rapidly progressed into the circumflex artery and left anterior descending coronary artery. Although two stents were deployed in the left main coronary artery, the patient died of ventricular fibrillation.

Key Words: Angiography; Complications; Coronary disease; Imaging; Pathology; Stents

A 43-year-old Caucasian man was admitted to hospital for chest pain. His past medical history was significant for prior inferior myocardial infarction and familial hypertriglyceridemia. Electrocardiography showed ST-segment elevation, but cardiac enzymes were normal. Selective right coronary angiography showed occlusion in the mid-portion. The first frames after the injection of contrast medium into the left coronary artery showed plaque in the proximal segment of the left main and subtotal stenosis of the mid-left anterior descending coronary artery (Figure 1A). Approximately 1 s later, dissection of the left main coronary artery developed, with intimal flaps at the level of the proximal segment of the main trunk and the origin of the left anterior descending artery (Figure 1B). Dissection rapidly progressed into the circumflex artery and left anterior descending coronary artery (Figures 1C to 1F), with impairment of blood flow (thrombolysis in myocardial infarction [TIMI] grade 1).

The patient had chest pain and developed cardiopulmonary arrest. Electrocardiography showed ST-segment elevation in leads V1 through V6. Cardiopulmonary resuscitation

L'apparition et la progression d'une dissection coronaire fatale pendant une coronarographie

Une coronarographie a été exécutée chez une femme de 43 ans hospitalisée pour des douleurs thoraciques. Les premières images après l'injection du produit de contraste ont révélé la présence de plaque dans le tronc de l'artère coronaire gauche et d'une sténose partielle de l'interventriculaire antérieure proximale. Une dissection du tronc de l'artère coronaire gauche s'est manifestée, avec des lambeaux intimaux au segment proximal du tronc et à l'origine de l'interventriculaire antérieure. La dissection a rapidement progressé dans l'artère auriculoventriculaire et l'interventriculaire antérieure. Bien que deux endoprothèses aient été installées dans le tronc de l'artère coronaire gauche, la patiente est décédée d'une fibrillation ventriculaire.

was successfully performed, and two overlapping stents (12 mm and 9 mm long) were deployed in the left main coronary artery (Figure 2), with fixation of the proximal intimal flap and partial recovery of blood flow (TIMI grade 2). Twenty minutes later, the patient died of an episode of noncardiovertible ventricular fibrillation.

At autopsy, opening of the left main coronary artery confirmed the presence of an atherosclerotic plaque 0.4 cm from the ostium, with stenosis of approximately 50% and an intimal laceration of 3 mm. Besides the main trunk, dissection involved the proximal segments of the circumflex artery (2 cm) and left anterior descending coronary artery (3 cm).

COMMENT

The episodes of chest discomfort were ascribed to thrombosis of the right coronary artery. Cardiac arrest during the procedure was due to massive ischemia of the left ventricle due to dissection of the vessels of the left coronary system. Ischemic myocardial damage led to irreversible ventricular fibrillation, despite partial blood flow restoration after stent deployment.

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Figure 1) Selective left coronary angiography in left cranial anterior oblique projection during inspiration. **A** Moderate plaque of proximal segment of left main coronary artery (thin arrow) and severe stenosis of mid-left anterior descending artery (thick arrow). **B** Onset of dissection with appearance of an intimal flap in the proximal segment of the left main coronary artery (arrow), at the level of the plaque, and at the origin of the left anterior descending artery (arrowhead). **C** Progression of dissection into the circumflex artery (arrowhead). Dissected vessel appears larger and more opacified due to surrounding contrast-filled false channel (arrow). **D to F** Three consecutive frames showing rapid progression of intimal flap into the left anterior descending coronary artery (arrowheads). Also note the progression of dissection as far as the origin of the left main coronary artery, with disappearance of proximal intimal flap and enlargement of vessel

Figure 2) Selective left coronary angiography in left cranial anterior oblique projection in expiration (A, B) and in right anterior oblique projection after stent deployment (C, D). **A** Opacification of false lumen of left main coronary artery (arrow) and abnormal opacification of the circumflex artery (arrowhead). Narrowing of lumen in proximal segments of circumflex artery and left descending anterior artery is also ascribed to coronary dissection. **B** Prolonged persistence of contrast medium in wall of left main coronary artery (arrow) and circumflex artery (arrowhead). **C** Stent deployment with patent lumen of left main coronary artery and fixation of the false lumen (arrows). **D** During washout phase, contrast medium in coronary wall no longer persists, whereas profiles of two stents are clearly visible (arrows)