

Cardiac Imaging

Iatrogenic Left Main Coronary Artery Dissection Mimicking Complete Proximal Occlusion of the Left Main Branches

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A 38-year-old woman was referred for coronary angiography in our centre, because of unstable angina. She had typical chest pain of 20 minutes' duration, with 1 mm transient ST elevation in ECG leads I, aVL, and V₆, and a negative troponin-I assay at 8 hours. The patient was hypertensive, a smoker, with high cholesterol levels and a family history of coronary artery disease.

Coronary angiography was performed via the right femoral artery using a 5F Judkin's Left-4 diagnostic catheter (Cordis J&J, Miami, Florida). On the first contrast injection in the right anterior oblique (RAO) cranial projection a possible ulcerated atheromatous plaque was noticed in the left main coronary artery (LMCA; Figure 1, magnified inset at top right, white arrows). On the second contrast injection in the left anterior oblique (LAO) cranial projection, an angiographic image of abrupt total occlusion of the LMCA branches was noticed and the catheter was immediately withdrawn (Figure 2). However, we noticed that there were no vessels arising from the presumably occluded proximal segments of the LMCA branches (Figure 2). Additionally, the patient remained asymptomatic and hemodynamically stable. Thus, we suspected that this angiographic image corresponded to contrast injection into the false lumen of an

LMCA dissection. Indeed, the catheter was re-engaged in the LMCA, and the subsequent injection (RAO cranial) disclosed a dissection flap severely obstructing the true lumens of the LMCA, left anterior descending (LAD), and circumflex (LCx) arteries (Figure 3, white arrows). At this point, the patient experienced chest pain and began to collapse. Bail-out stenting of the LMCA, LAD, and LCx was performed successfully under intravascular ultrasound guidance with three zotarolimus eluting stents (3/12, 2.75/12, and 2.5/18 mm respectively; Figure 4). Six months later the patient is asymptomatic, with follow-up coronary angiography disclosing no restenosis.

Iatrogenic LMCA dissection constitutes a rare (<1%), but potentially catastrophic complication of diagnostic coronary angiography, being more frequent during coronary intervention.^{1,2} Catheter manipulation and LMCA atherosclerosis are considered predisposing factors.¹ More specifically, the use of Amplatz-shaped catheters, deep intubation, unskilled manipulations, vigorous contrast ejection—especially in the presence of ulcerated plaques—and variations in the coronary ostial anatomy, increase the risk.³ The clinicopathologic substrate ranges from relatively asymptomatic local tears, to extensive dissection flaps ob-

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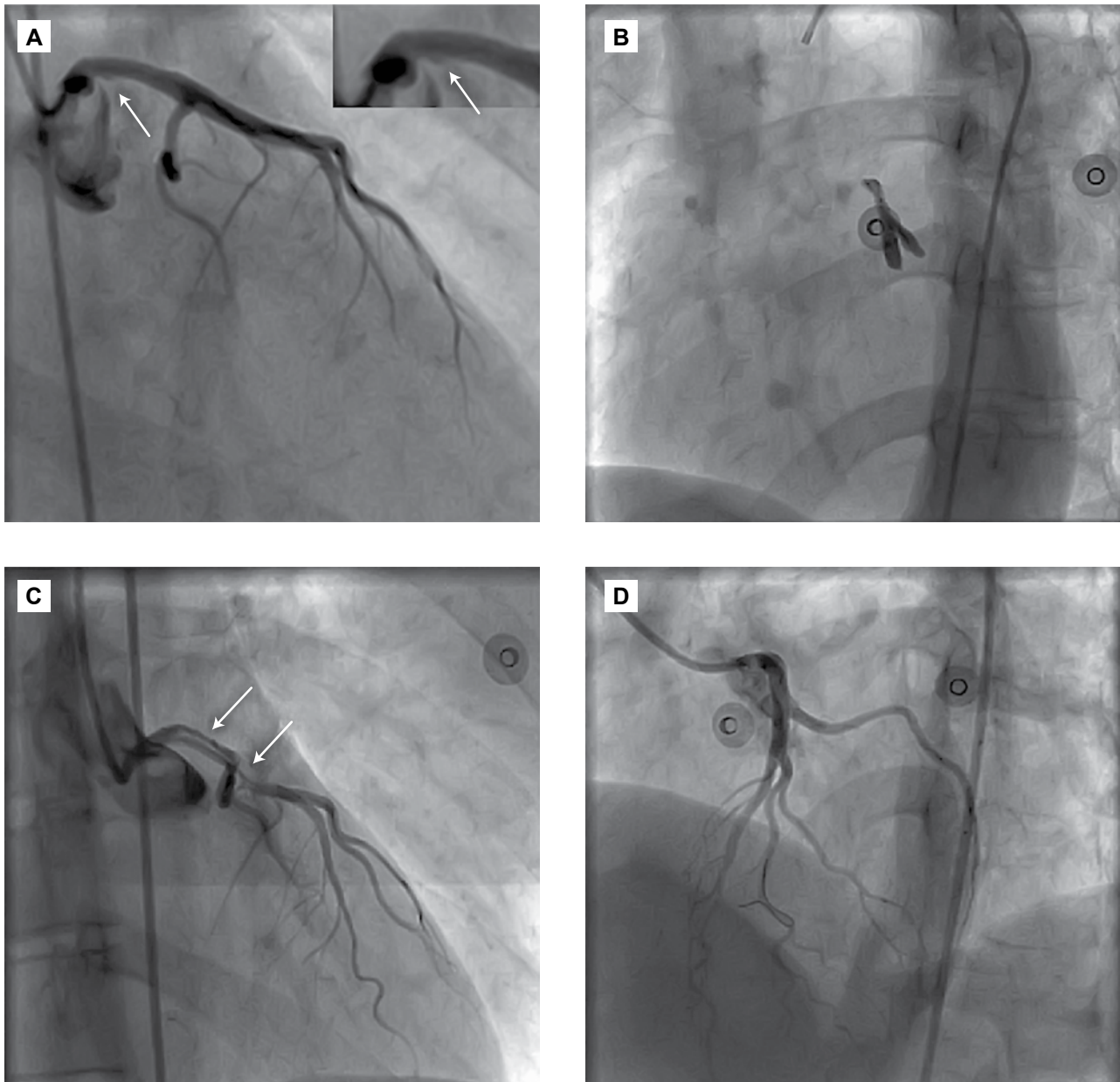


Figure 1. A. Ulcerated atheromatous plaque in the LMCA. B. Angiographic image of abrupt total occlusion of the LMCA branches. C. Dissection flap severely obstructing the true lumens of the LMCA, LAD and LCx arteries. D. Final angiographic result following implantation of three stents. LMCA – left main stem; LAD – left anterior descending; LCx – left circumflex.

structing the LMCA lumen, leading to hemodynamic collapse.² Retrograde extension of the dissection into the aortic root may occur, especially in patients who initially present with acute myocardial infarction.⁴

It seems that the nature of this complication is dynamic, as the dissection may extend and/or intramural hematoma may develop, leading to progressive deterioration.^{2,5} Because of this dynamic nature, a conservative treatment strategy is rarely adopted, although modern high-fidelity intravascular imag-

ing has been reported to aid in deciding on conservative management, especially if an antegrade dissection flap is not present.⁶ Urgent coronary artery bypass grafting (CABG), may be performed in relatively stable patients, especially if they have multivessel disease.² Bail-out stenting is considered an acceptable treatment strategy with a high success rate and reasonable long-term outcomes, especially in patients with abrupt closure of the LMCA, and/or its branches.^{1,5,7} Nevertheless, long-term outcomes appear to

be independent of the revascularization strategy, with revascularization being more frequent following bail-out stenting.² Successful wiring of the true lumen of the LMCA and its branches requires skilled operators, as the false lumen is usually larger, as exemplified in our image.⁵ When the dissection extends into the ascending aorta, stenting vs. CABG is recommended, depending on the length of the dissection.⁴

In conclusion, iatrogenic LMCA dissection although rare, constitutes a dynamic condition that usually requires prompt revascularization. Knowledge of the predisposing factors, familiarity with the angiographic appearance, and operative skills are required for avoiding or treating this potentially catastrophic complication should it arise.

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Erratum

Attitudes of Healthcare Professionals Involved in Cardiology Practice Towards Key Points of Contemporary Guidelines on Resuscitation

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