CLINICAL VIGNETTE

Uncommon use of rotational atherectomy: management of coronary artery perforation

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A 65-year-old man with a history of two coronary artery bypass graft (CABG) operations (2011, 2015) was referred to hospital because of unstable angina. Coronary angiography showed a patent left main coronary artery and chronic total occlusions (CTOs) of the following vessels: mid segment of the left anterior descending artery (LAD), proximal segment of the left circumflex artery (LCx), with a significant calcification (Fig. 1A), and proximal segment of the right coronary artery. The left internal mammary artery was previously used for the first off-pump coronary artery bypass surgery and was also occluded. Both the right internal mammary artery to LAD graft and the saphenous vein graft (SVG) to the posterior descending artery were patent. There was severe stenosis in the proximal segment of the SVG-LCx graft, and the LCx became narrower distally to the graft anastomosis (Thrombolysis in Myocardial Infarction [TIMI] flow grade 1) (Fig. 1B). The Progress score was 2 points, and the J-CTO score was 1 point. The strategy was to recanalise the LCx using an antegrade wire escalation technique via right femoral access. A composite core guidewire was swiftly advanced to the lesion, supported by a microcatheter. The attempts to advance the microcatheter and balloons distally to the lesion proved ineffective, despite using a guide extension catheter as support (Fig. 1C), and eventually resulted in a perforation (Ellis type III) of the proximal segment of the LCx (Fig. 1D). Even though the microcatheter could not cross the lesion, the RotaWireTM (Boston Scientific, Marlborough, MA, USA) was advanced to the distal segment of the LCx without complication. Rotational atherectomy of the LCx using a 1.25-mm burr was performed (Fig.1E), followed by inflation of a 2.0 × 15 mm semi-compliant balloon to seal the perforation. A 2.75 × 28 mm drug-eluting stent was successfully deployed in the proximal segment of the LCx (Fig. 1F). A follow-up echocardiography showed a small amount of fluid near the left ventricle. To our knowledge, this is the first report of rotational atherectomy in a perforated vessel. Perforation is a much-feared severe complication of coronary interventions to treat CTO, with an incidence rate of 4.1% [1]. Coronary perforations that develop in post-CABG patients may result in localised effusion or intramyocardial haematoma, which can compress heart structures such as atria or ventricles. In such a case, delayed treatment can have fatal results [2]. Our report shows that rotational atherectomy can be performed in order to prepare a lesion for stent deployment to close a perforation, even if the perforation site is impassable for the smallest balloons, which makes deployment of a covered stent impossible. Rotational atherectomy modifies and relocates the plaque, which may result in closure of the perforation, and even if it does not, subsequent usage of a covered stent may be feasible in most cases.

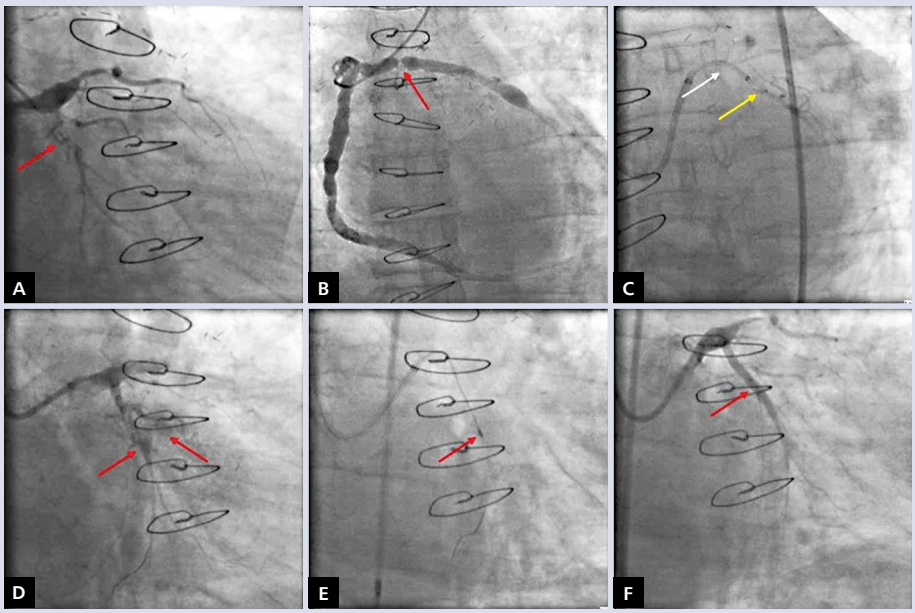

Figure 1. Coronary angiography; **A.** Right anterior oblique view with caudal angulation showing chronic total occlusion (CTO) of the proximal part of the left circumflex coronary artery (LCx) (arrow); J-CTO score — 1 point; Progress score — 2 points; **B.** Critical stenosis of the saphenous vein graft (SVG) to LCx (arrow) and patent SVG to posterior descending artery; **C.** A 7 F extra-backup 4.0 guiding catheter in the left main coronary artery, supported by a guide extension catheter (white arrow) and a microcatheter (yellow arrow); **D.** Perforation of proximal segment of the LCx (arrows); the patient was haemodynamically stable; **E.** Rotational atherectomy in the perforated vessel using a 1.25-mm burr (arrow); **F.** Final outcome of percutaneous coronary intervention showing no signs of perforation after drug-eluting stent deployment (arrow)

References

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