

IMAGING VIGNETTE

INTERMEDIATE

CLINICAL VIGNETTE

Covered Stents for the Percutaneous Management of Delayed Coronary Wall Rupture Following Subadventitial Rotational Atherectomy



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ABSTRACT

We present herein the case of a delayed covered coronary wall rupture occurring as a rare complication of rotational atherectomy performed in the subintimal space after antegrade dissection reentry for percutaneous recanalization of a long and heavily calcified left anterior descending chronic total occlusion, which was successfully managed percutaneously with the implantation of 2 covered stents. (**Level of Difficulty: Intermediate.**)

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A 64-year-old man with arterial hypertension, dyslipidemia, and severe chronic obstructive pulmonary disease (COPD) was admitted to the hospital with stable angina. Diagnostic coronary angiogram demonstrated a long heavily calcified mid-left anterior descending artery (LAD) chronic total occlusion (CTO) (J-CTO score 4), a severe ostial intermediate artery stenosis, and a second marginal branch stenosis (**Figure 1A**, **Video 1**). The patient was turned down for surgery by the Heart Team because of severe COPD. After discussion, the patient agreed to undergo multivessel staged percutaneous coronary intervention (PCI). LAD CTO PCI was performed according to the hybrid algorithm. After unsuccessful antegrade wire escalation, the CTO was crossed using wire-based antegrade dissection and reentry technique, but was uncrossable with a 1.0-mm low-profile balloon (**Video 2**). After wire exchange through a microcatheter, intensive subadventitial plaque modification was performed using a 1.25-mm rotational atherectomy burr (**Video 3**) allowing subsequent progressive balloon crossing (**Figure 1B**). After predilatation using high-pressure noncompliant balloons, two 3.5 × 34-mm and 3.0 × 38-mm zotarolimus-eluting stents (Resolute Onyx, Medtronic Inc., Minneapolis, Minnesota) were successfully delivered to the proximal and mid-LAD with a good final angiographic result (**Figure 1C**, **Video 4**). Due to the complexity of the PCI performed for the CTO revascularization, control coronary angiogram was performed at 3 months and demonstrated 2 large areas of contrast extravasation at the site of previously implanted stents on proximal and mid-LAD, suggesting delayed covered coronary artery wall rupture (**Figure 1D**, **Video 5**). PCI to proximal and mid-LAD with 2

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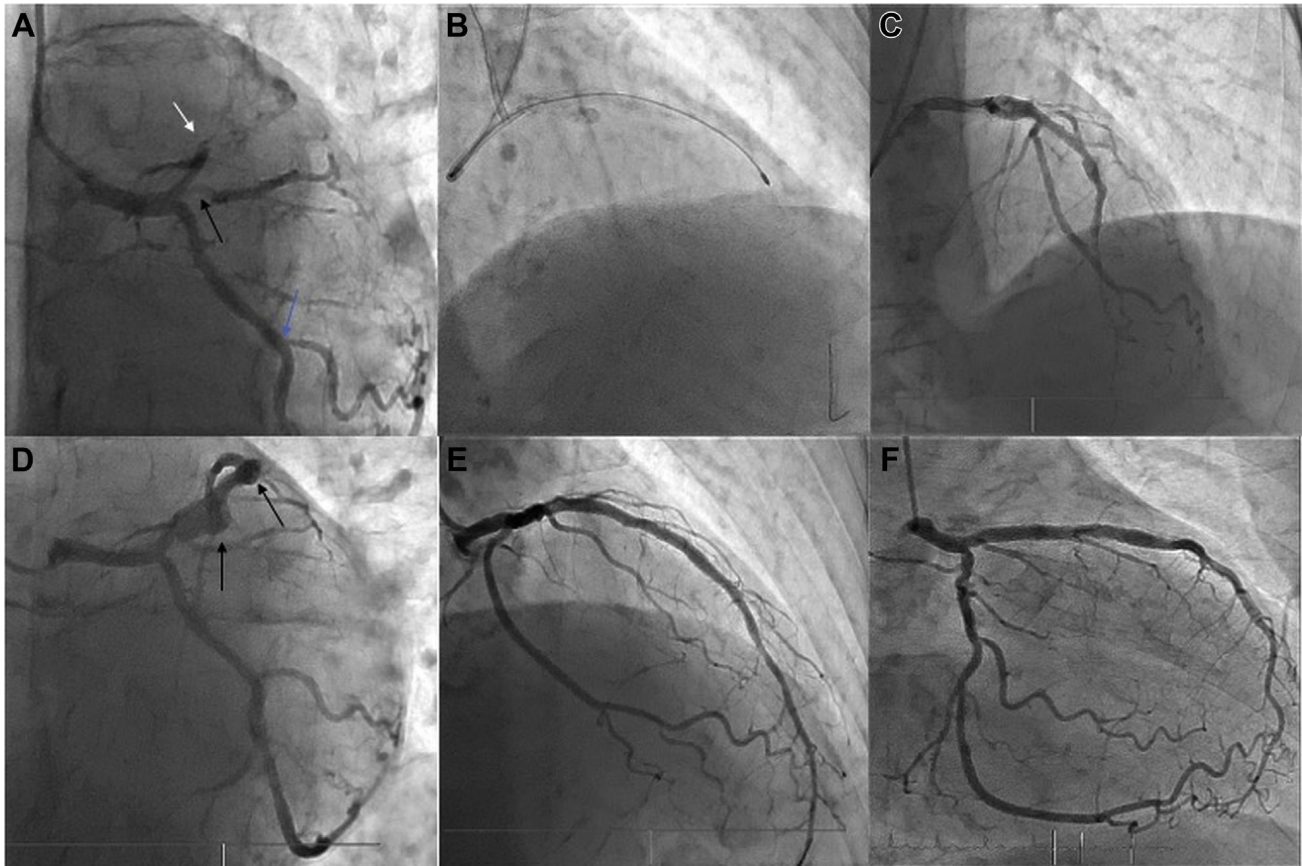
The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the *JACC: Case Reports* [author instructions page](#).

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**ABBREVIATIONS
AND ACRONYMS****CA** = coronary angiogram**COPD** = chronic obstructive pulmonary disease**CTO** = chronic total occlusion**LAD** = left anterior descending artery**PCI** = percutaneous coronary intervention

3.5 × 20-mm covered stents (PK Papyrus, Biotronik, Bülach, Switzerland) was performed with immediate complete disappearance of the contrast extravasation confirmed by coronary angiography (Figure 1E, Video 6). Six-month control coronary angiogram demonstrated patent covered stents and no residual contrast leakage (Figure 1F, Video 7).

Rotational atherectomy in the subintimal space following successful CTO coronary guidewire crossing has been previously described as a possible adjunctive therapy for balloon-uncrossable CTO lesions (1). In our case, this technique allowed CTO recanalization without immediate complication. At 3-month follow-up, delayed covered coronary wall rupture was demonstrated by coronary angiogram. Percutaneous treatment was achieved by implantation of newer-generation thin-strut covered stents.

FIGURE 1 Baseline, 3-Month and 6-Month Follow-up Coronary Angiograms

(A) Baseline coronary angiography demonstrating a long heavily calcified mid-left anterior descending artery chronic total occlusion (**white arrow**), a severe ostial intermediate artery stenosis (**black arrow**) and a second marginal branch stenosis (**blue arrow**). (B) Successful left anterior descending artery chronic total occlusion crossing using antegrade dissection and reentry technique followed by subintimal plaque modification with rotational atherectomy. (C) Final angiographic result after implantation of 2 drug-eluting stents to proximal and mid-LAD. (D) Three-month control coronary angiography demonstrating large areas of contrast extravasation (black arrows) at the sites of previously implanted stents on proximal and mid-left anterior descending artery. (E) Final angiographic result after implantation of 2 covered stents on proximal and mid-left anterior descending artery. (F) Six-month control coronary angiography demonstrating patent covered stents and no residual contrast leak.

AUTHOR DISCLOSURES


The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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KEY WORDS coronary angiogram, percutaneous coronary intervention, stents

 **APPENDIX** For supplemental videos, please see the online version of this paper.