

Optical coherence tomography-guided trapping of a ruptured balloon with a coronary stent

Paweł Gašior, Marek Milewski, Wojciech Wojakowski

Division of Cardiology and Structural Heart Diseases, Medical University of Silesia, Katowice, Poland

Correspondence to:

Paweł Gašior, MD, PhD,
Division of Cardiology
and Structural Heart Diseases,
Medical University of Silesia,
Ziołowa 45,
40–635 Katowice, Poland,
phone: +48 32 2523930,
e-mail: p.m.gasior@gmail.com

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A 65-year-old male with prior myocardial infarction treated with implantation of a drug-eluting stent (Xience, Abbott, IL, US) in the right coronary artery (RCA) four months earlier was admitted to our center for unstable angina. The patient had a history of heavy smoking and diabetes. Baseline angiography showed significant in-stent restenosis in the medial RCA with excessive neointimal hyperplasia with stent expansion <90% visualized by optical coherence tomography (OCT) (Figure 1A). Relatively early stent failure was most likely associated with both patient-related factors (diabetes and history of excessive smoking) and suboptimal stent expansion during the initial procedure [1, 2]. We decided to perform angioplasty of the medial segment of the RCA. A non-compliant (NC) 4.0 × 15 mm balloon (Emerge, Boston Scientific, Marlborough, MA, US) ruptured at the rated burst pressure (20 atm), and during withdrawal, the system exhibited significant resistance. The balloon catheter was pulled out of the body and on visual inspection, the tip and membranous part of the catheter were missing. Angiography and OCT showed a filling defect in the proximal segment of the vessel (Figure 1B). Longitudinal imaging and 3D reconstruction clearly visualized the presence of a foreign body inside the lumen of the artery (Figure 1C, D). Multiple attempts to retrieve the entrapped balloon failed. They included inflation of a buddy balloon distal to the entrapped device with subsequent gentle withdrawal as well as entrapment of the ruptured balloon anchored inside a guide catheter by the buddy balloon followed by unsuccessful retraction. We decided to compress the balloon fragment against the

vessel wall with a drug-eluting stent (DES). Alex Plus DES (Balton, Warszawa, Poland) was implanted and postdilated using a 4.5 mm NC balloon. The in-stent restenosis in the medial RCA was treated with DES (Resolute, Medtronic, Minneapolis, MN, US). Final angiography and OCT imaging confirmed successful bailout stenting with an acceptably apposed and fully covered balloon fragment (Figure 1E, F).

Although entrapment of a coronary balloon is an infrequent PCI complication, it can lead to severe complications, such as coronary thrombosis or perforation and impaired distal coronary flow [3]. Several mechanisms may lead to balloon entrapment, including entanglement of balloon membrane in calcium or stent strut as well as rupture of the delivery shaft [4, 5]. The choice of balloon retrieval or trapping strategy must be individualized with regard to patient anatomy and clinical status. Ultimately, surgical retrieval may be the only viable option if transcatheter removal fails [2, 3]. In the presented case, OCT allowed clear visualization of the balloon fragment and its precise sealing to the arterial wall, which minimized the chances of stent thrombosis. The patient's further clinical course was favorable, with no adverse events.

Article information

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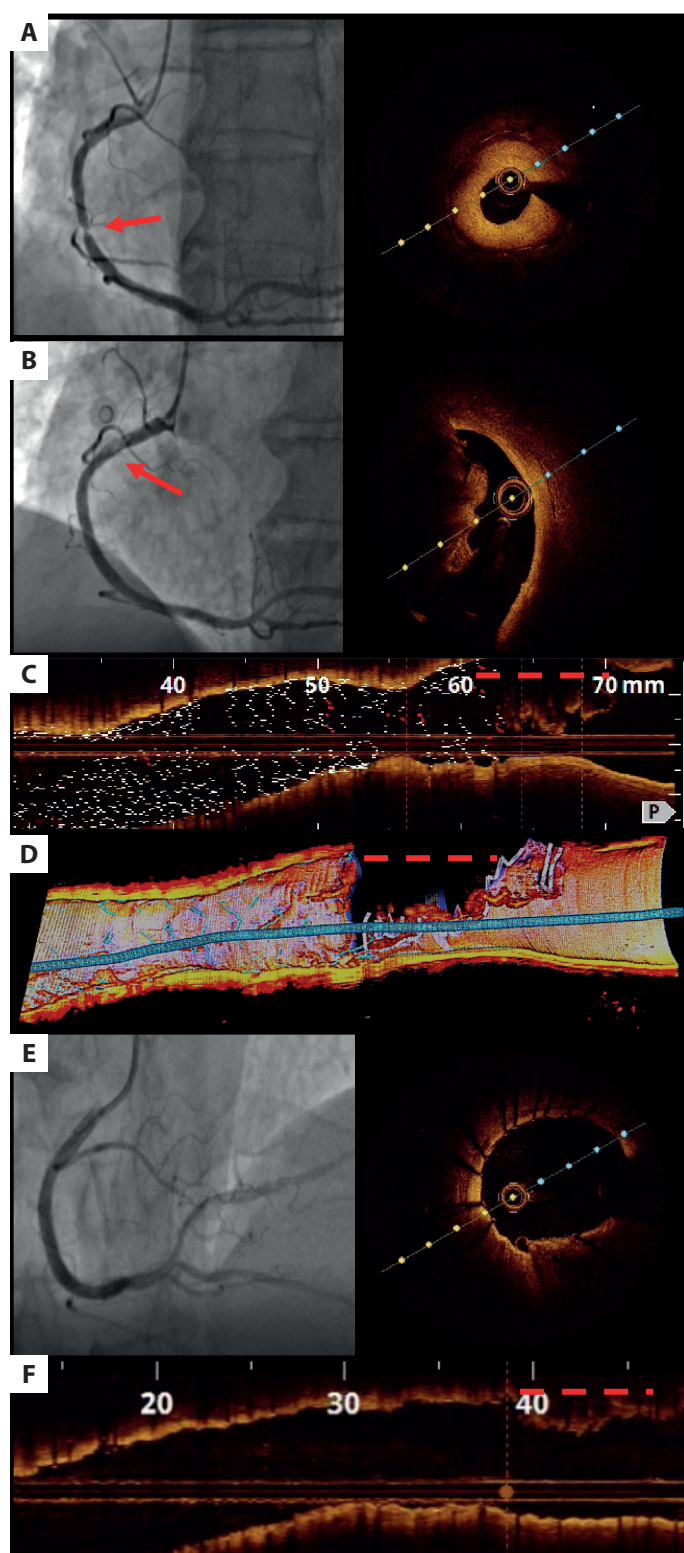


Figure 1. Coronary angiography (CAG) and optical coherence tomography findings in the right coronary artery (RCA). Baseline CAG showed significant restenosis (red arrow) with extensive neointimal proliferation and mild stent underexpansion (A). Filling defect (red arrow) in the proximal segment of the RCA (B). Optical coherence tomography (OCT) longitudinal image (C) and 3D visualization (D) of the entrapped balloon fragment (dotted red line). Favorable final angiographic and cross-sectional OCT image of the sealed balloon following stent implantation (E). Longitudinal OCT evaluation demonstrated acceptable expansion at the level of the trapped balloon

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