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

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

**Short title:** Ruptured balloon in coronary artery

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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 ago was admitted to our clinic due to unstable angina. The patient had a history of heavy smoking and diabetes. Baseline angiography revealed 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 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 was missing. Angiography and OCT revealed a filling defect in the proximal segment of the vessel (Figure 1B). Longitudinal imaging and 3D reconstruction clearly visualized the presence of the foreign body inside lumen of the artery (Figure

**1C, D**). Multiple attempts to retrieve the entrapped balloon failed including inflation of buddy balloon distal to entrapped device with subsequent gentle withdrawal as well as entrapment of ruptured balloon anchored inside guide catheter by 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 postdilatated using 4.5 mm NC balloon. The in-stent restenosis in the medial RCA was treated with DES (Resolute, Medtronic, USA). Final angiography and OCT imaging confirmed successful bailout stenting with acceptably apposed and fully covered balloon fragment (Panel E, F). Although the 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 to anatomy and clinical status. Ultimately, surgical retrieval may be the only viable option if transcatheter removal failed [2, 3] In the presented case, OCT allowed clear visualization of the balloon fragment and allowed its precise sealing to the arterial wall minimizing the chances of stent thrombosis. The further clinical course of the patient was favorable, with no adverse events.

### **Article information**

**Conflict of interest:** None declared.

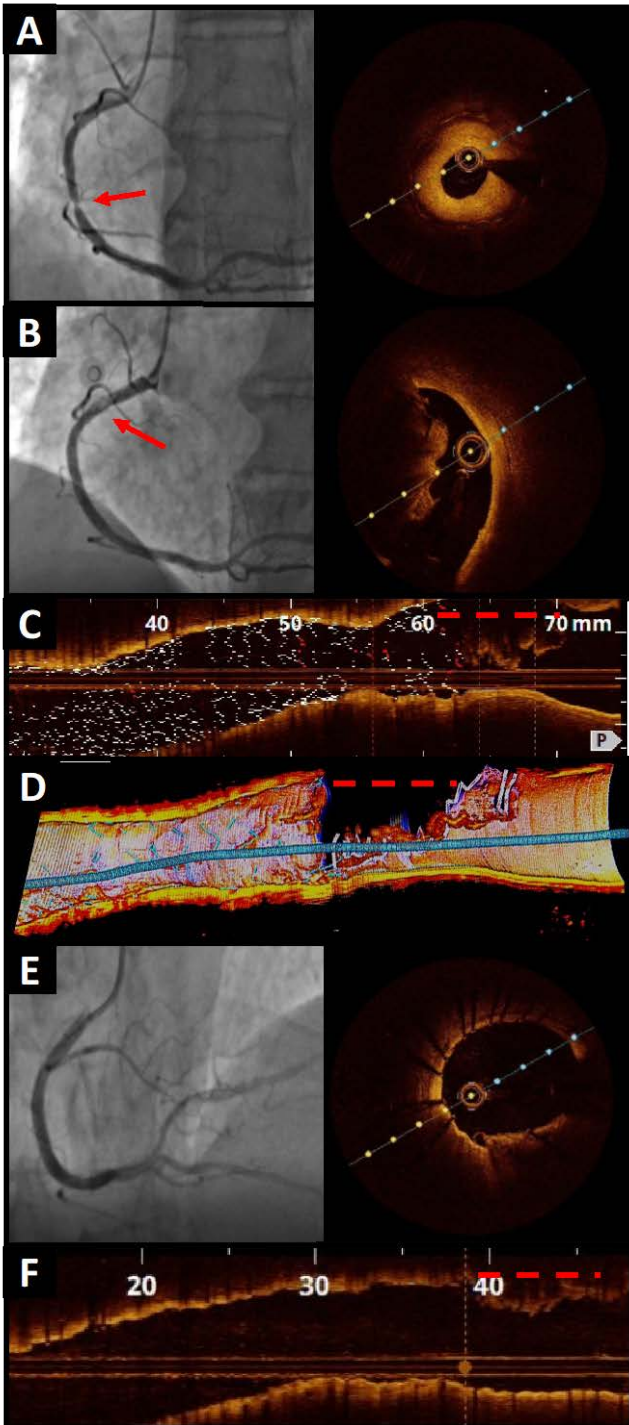
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**Figure 1.** Coronarography angiography (CAG) and optical coherence tomography findings in the right coronary artery (RCA). Baseline CAG revealed significant restenosis (red arrow) with extensive neointimal proliferation and mild stent underexpansion (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 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.