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In-stent balloon rupture and entrapment during post-dilatation in an infarct-related artery followed by successful retrieval

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A 49-year old patient was admitted to the cardiology department with a diagnosis of non-ST elevated myocardial infarction (NSTEMI). He was treated within 3 days using aspirational thrombectomy for ischemic stroke. An echocardiogram showed preserved left ventricular ejection fraction with regional hypokinesia of the lateral and posterior wall of the left ventricle. The coronary angiography exhibited well organized thrombus in the mid-circumflex artery (mid-Cx) (Figure 1A). Aspirational thrombectomy was performed via the Export Aspiration System (Medtronic, Minneapolis, MN, US) following pre-dilatation with a 3.5 × 20 mm semi-compliant balloon. Despite inflation of the balloon, the optical coherence tomography intravascular probe did not cross the lesion. Based on angiography, a 4.0 × 38 mm drug eluting stent was implanted. During post-dilatation, a 4.5 × 15 mm non-compliant balloon inflated at 24 atm ruptured and was removed “en-bloc” with a guidewire and guide catheter (Figure 1B). The shaft and distal end of the ruptured balloon was entrapped in the vessel (Figure 1C). The patient remained hemodynamically stable, therefore, bailout surgery was deferred. The guiding catheter was switched to a 7F system. Attempts of crossing the lesion with Runthrough NS, BMW II and Whisper MS guidewires were unsuccessful. Eventually, the Gaia Second (Asahi

Intecc Co., Nagoya, Japan) was provided into the distal end of the vessel. A 3.0 × 20 mm semi-compliant balloon was inflated to 18 atm, allowing to cross the defragmented balloon with the 4.0 mm Amplatz "Goose-Neck" Microsnare System (Microvena, White Bear Lake, Minnesota, MN, US) and successfully retrieve the defragmented balloon (Figure 1E). After removal, the stent was post-dilatated with a 4.0 × 15 non-compliant balloon catheter. Intravascular ultrasound was applied to rule out significant calcifications and confirm optimal outcome of the procedure (Figure 1F). Post-procedural hospitalization was uneventful and the patient was discharged within the next 3 days.

Entrapment of an intra-coronary device is a rare, but it is, nonetheless, a serious complication. Calcifications, tortuous anatomy, non-dilatable lesions increase the risk of device entrapment [1]. In the majority of cases, balloon rupture with subsequent entrapment occurs during pre-dilatation or stent implantation. Unexpectedly, in this case, the balloon rupture and entrapment took place during post-dilatation. Moreover, the vessel was not heavily calcified or tortuous. This proves that the device entrapment is unpredictable and can occur during any stage of the procedure. Devices allowing successful managing of such complications should be available at every catheterization laboratory. Such devices were used in many clinical scenarios [2]. The Amplatz Goose Neck is based on a 90-degree angled nitinol loop allowing retrieval of foreign bodies in the coronary and peripheral vessels. In the case of retrieval failure, "burying" the object under a new stent or bail-out surgical management may be considered.

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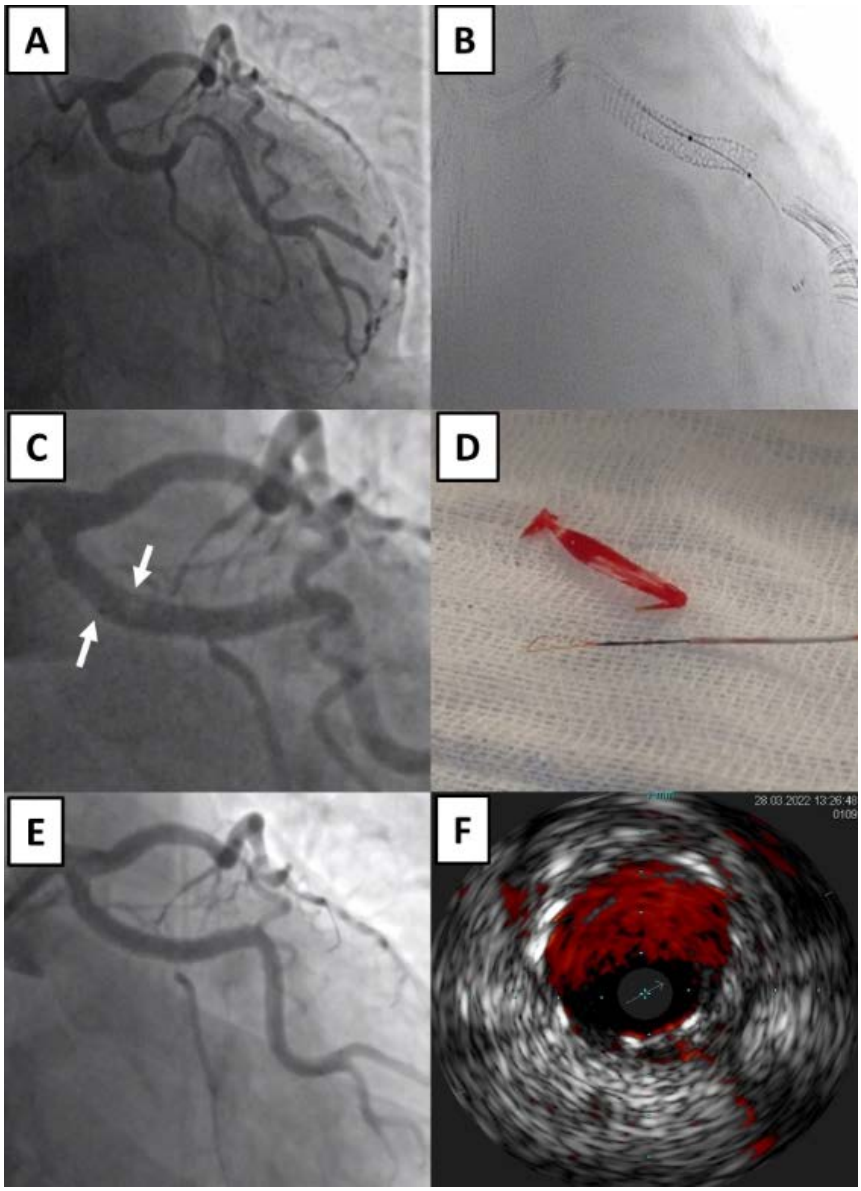

Figure 1. A. Initial left coronary artery angiography with thrombus in mid-Cx (arrow); **B.** Post-dilatation of stent with 4.5 × 20 mm non-compliant balloon inflated to 24 atm; **C.** Control angiography disclosing distal marker and fragment of the defragmented balloon (arrows); **D**. Retrieved distal part of the ruptured balloon and Amplatz Microsnare System; **E.** Final angiography after retrieval of the ruptured balloon by means of 4 mm Amplatz "Goose-Neck" Microsnare catheter (Microvena, White Bear Lake); **F.** Intravascular ultrasound of Cx confirming good stent apposition and precluding significant calcifications