

# A broken balloon catheter entrapped in coronary artery due to its rupture during angioplasty of a chronic total occlusion: a rare complication of angioplasty managed conservatively

Uwięźnienie uszkodzonego cewnika balonowego w tętnicy wieńcowej spowodowane jego pęknięciem w trakcie angioplastyki przewlekłej całkowitej zmiany: rzadkie powikłanie angioplastyki leczone zachowawczo

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## Abstract

We present a case of a 72-year-old patient who underwent percutaneous transluminal coronary angioplasty due to a chronic total occlusion of left anterior descending artery. The balloon catheter ruptured and entrapped in the chronic lesion and had broken while attempting to remove from the lesion. End portion of the balloon catheter retained in the lesion. We tried various extraction methods but were unsuccessful. Because of the patient's high surgical risk, we left the broken part of balloon catheter in lesion and fixed it to the coronary wall by stenting.

Key words: percutaneous coronary intervention, balloon angioplasty, complications, coronary device entrapment

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## Introduction

Entrapped and broken percutaneous transluminal coronary angioplasty (PTCA) balloon catheter is a rare but serious complication of intervention cardiology. It requires retrieval of the catheter to prevent further complications. This report describes a rare situation in which a ruptured and entrapped balloon with broken catheter was caught in an incompletely dilated chronic total occlusion (CTO) during a percutaneous coronary intervention (PCI) procedure in a 72 year old woman.

## Case report

A 72-year-old female patient was underwent PCI due to a CTO of left anterior descending artery (LAD) (Figure 1). The lesion was successfully crossed with a chronic occlusion

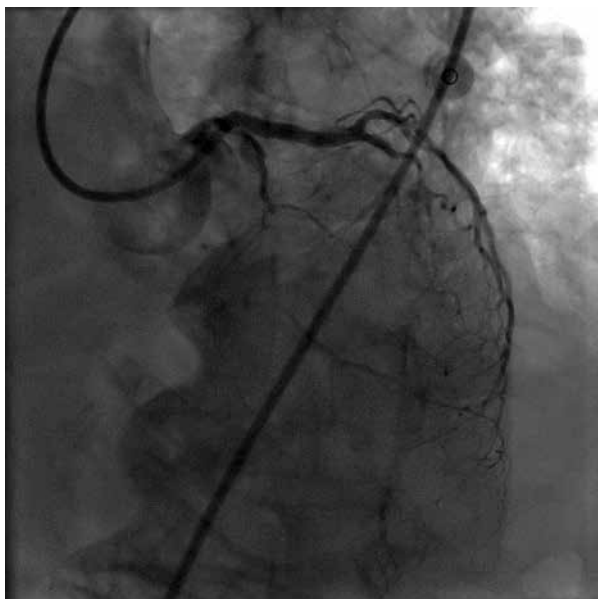
guide wire with the help of Tornus penetration catheter (Asahi Kasei Medical, Japan). We changed the chronic occlusion guide wire with a floppy wire. A 1.0 × 20 mm CTO balloon catheter was passed to inflate the lesion. After this, in order to facilitate the stent crossing, lesion dilated sequentially from distal to proximal with a 2.5 × 20 mm non-compliant balloon. Balloon ruptured during the inflation of the balloon. The balloon catheter entrapped in the lesion and it could not be retrieved from the LAD. The tip of the balloon catheter broke and remained in the lesion while trying to get back by the operator. The patient developed angina, bradycardia and hypotension. We crossed the lesion with a second guide wire. The tip of the balloon could not be retrieved by snare. The lesion was dilated with another non-compliant balloon for the release of the trapped broken balloon. We tried to capture the broken balloon by snare again, but have not succeeded. Because of the high surgical

risk of the patient, the surgical removal of the broken balloon was not considered. It was decided to leave the broken part of balloon catheter in lesion and fix it to the coronary wall by stenting. A drug-eluting stent was passed through the lesion to cover the broken part of the balloon catheter (Figure 2). Due to suboptimal stent expansion, post-dilation was made with a non-compliant balloon and patient had a good angiographic outcome (Figure 3, 4).

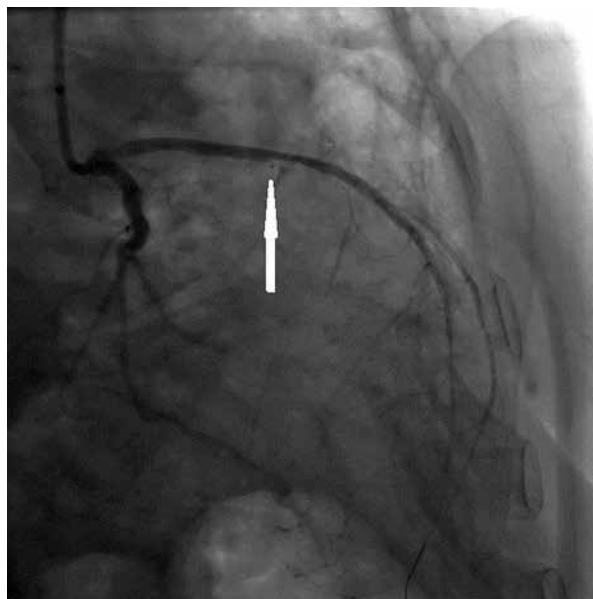
Patient was followed for 24 hours in intensive care unit and she had no complication.

### Conclusions

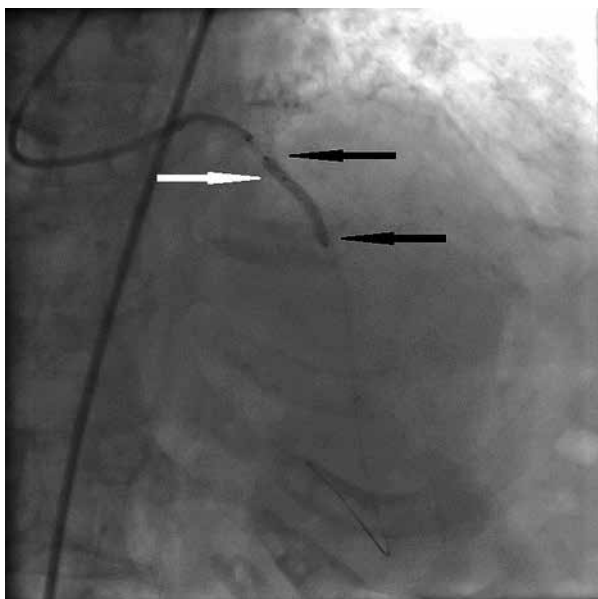
PCI for CTO of coronary arteries is one of the most technically challenging areas for the interventional cardiologist with lower procedural success rates and higher compli-



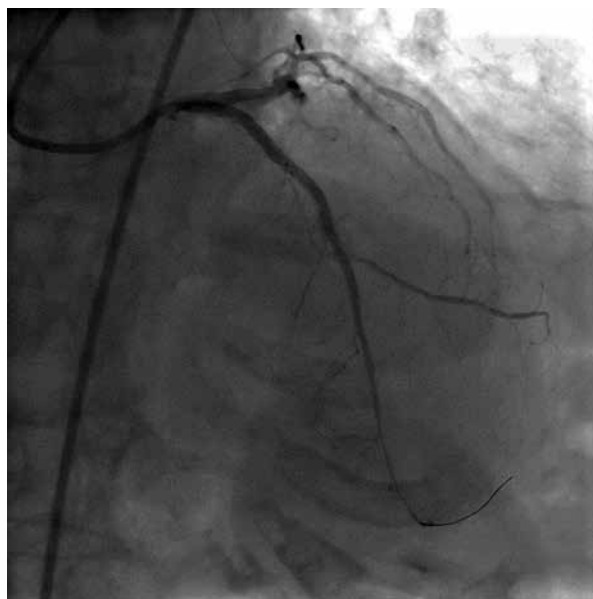
**Figure 1.** Coronary angiography with chronic total occlusion in left anterior descending artery



**Figure 3.** The caudal right anterior oblique angiographic image shows suboptimal stent expansion and distal marker of broken balloon catheter in left anterior descending coronary artery (white arrow)



**Figure 2.** The cranial coronary angiographic image shows markers of drug eluting stent (black arrows) and distal marker of broken balloon catheter in left anterior descending coronary artery (white arrow)



**Figure 4.** The cranial coronary angiographic image shows optimal stent expansion in left anterior descending coronary artery after post-dilatation

cation rates compared with those for the non-occluded coronary arteries or acutely-occluded arteries [1]. Despite advances in device technology, the management of resistant, calcific lesions remains one of the greatest challenges in successful CTO intervention. One of the established techniques to modify calcific lesions is the use of high-pressure non-compliant balloon dilation. The nature of the fibro-calcific plaque reduces vessel distensibility, making it resistant to aggressive balloon dilation. Therefore, even at low pressures, balloon rupture and entrapment can be observed in calcified lesions. If equipment is retained or entrapped within a coronary artery, this can lead to myocardial ischemia, infarction, and lethal arrhythmias [2, 3]. Management of these cases is dictated by the hemodynamics; therefore, the immediate removal of the broken piece of the angioplasty catheter is imperative when the patient becomes hemodynamically unstable or there is evidence of an acute coronary event. There are reports in which guidewires or components of PTCA lodged in coronary arteries have managed conservatively [4, 5]. Various percutaneous retrieval methods have

already been described in the literature: loop snare, dornia basket, double or triple guidewire technique, hooked guidewire, Fogarty technique, jailed-wire technique, and balloon inflation technique [3, 6–10]. Although a variety of techniques have been introduced in these situations, most of them have been time and cost consuming methods. In addition, none of these techniques have emerged as the best retrieval modality. In cases where the broken piece cannot be removed and impaired the patient's hemodynamics, stenting broken piece in coronary artery without inhibit of coronary circulation, may be the most appropriate approach.

Complications of retained or entrapped equipment in the coronary system are still encountered during angioplasty procedures. In cases where the broken piece cannot be remove, fixing it to the coronary wall with stenting, can be considered as a management option.

### Conflict of interest(s)

The authors declare no conflict of interest.

### Streszczenie

Przedstawiono przypadek 72-letniego chorego poddanego przezskórnej śródnaczyniowej angioplastyce wieńcowej z powodu przewlekłej całkowitej okluzji przedniej lewej tętnicy zstępującej. Cewnik balonowy pękł i uwiązał w przewlekłej zmianie, a następnie oderwał się w czasie próby jego wyciągnięcia. Końcowa część cewnika pozostała w zmianie. Autorom nie udało się jej usunąć mimo stosowania różnych metod. Ze względu na wysokie ryzyko operacyjne u pacjenta pozostawiono oderwany fragment cewnika w zmianie i naprawiono ścianę naczynia za pomocą stentu.

Słowa kluczowe: przezskórna interwencja wieńcowa, angioplastyka balonowa, powikłania, uwięźnięcie urządzenia w tętnicy wieńcowej

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