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Authors: Adam Kern, Robert Gil, Grzegorz Wasilewski, Krystian Bojko, Sebastian Pawlak, Grzegorz Poskrobko, Ewa Andrasz, Manas Atre, Jacek Bil

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When an interventional cardiologist needs an interventional radiologist: Efficient treating of coronary perforation

Adam Kern1,2, Robert Gil2–3, Grzegorz Wasilewski4, Krystian Bojko1,2, Sebastian Pawlak1,2, Grzegorz Poskrobko2, Ewa Andrasz2, Manas Atre5, Jacek Bil3

1Department of Cardiology and Internal Medicine, University of Warmia and Mazury, Olsztyn, Poland
2Department of Cardiology, Regional Specialist Hospital in Olsztyn, Olsztyn, Poland
3Department of Invasive Cardiology, Centre of Postgraduate Medical Education, Warszawa, Poland
4Department of Radiology and Medical Imaging, Regional Specialist Hospital in Olsztyn, Olsztyn, Poland
5School of Medicine, Collegium Medicum, University of Warmia and Mazury, Olsztyn, Poland

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Correspondence to:
Adam Kern, MD, PhD, FESC,
Department of Cardiology and Internal Medicine, University of Warmia and Mazury,
Żołnierska 18, 10–561 Olsztyn, Poland
phone/fax: +48 89 538 63 49,
e-mail: adamkern@mail.com

Coronary artery perforation is a life-threatening sequel complicating 0.2%–0.9% of percutaneous coronary interventions (PCI) [1]. Here, we present an example of a fruitful cooperation between interventional cardiologist and radiologist in managing distal right coronary artery (RCA) perforation. A 76-year-old male with a history of dyslipidemia, diabetes type 2 and prior PCI in left circumflex artery was admitted for performing PCI in RCA with rotational atherectomy. The patient was on the dual antiplatelet therapy (acetylsalicylic acid 75 mg and clopidogrel 75 mg). From the right radial approach, rotablation was performed with 1.5 mm and 1.75 mm burrs in proximal and mid RCA segments (Figure 1A–B). After successful rotablation, the working guidewire was advanced (Sion blue with a J tip, Asahi Intecc, Irvine,
CA, US) and two sirolimus-eluting stents Prolim (Balton, Poland) were deployed in the mid (3.5 × 25 mm) and proximal (4.0 × 29 mm) segments. Stents were optimized with non-complaint balloon catheter (4.0 × 12 mm) under intravascular ultrasound imaging (Figure 1C). However, at the final checking, the contrast extravasation next to one of the posterolateral branches was disclosed (Figure 1D; Supplementary material, Video S1). Despite three prolonged balloon inflations, the leakage was not stopped. In echocardiography, we revealed no signs of cardiac tamponade; therefore, no protamine sulfate was administered. After consulting with the interventional radiologist, five spiral coils were used: three 1 mm/3 cm MicroPlex Hydrosoft 3D (MicroVention, Aliso Viejo, CA, US) and two 2 mm/3 cm + 2.5 mm/6 cm Axium Prime coils (Medtronic, Minneapolis, MN, US) (Figure 1E). The perforation was successfully closed with no excessive fluid in pericardium (Figure 1F; Supplementary material, Video S2 and S3). The patient was discharged after two days on dual antiplatelet therapy.

In some cases, prolonged balloon inflation may lead to hemostasis, but if pericardial bleeding continues definitive treatment may be needed (covered stents or cardiac surgery) [2]. However, covered stents are not feasible for small vessels. In such cases, embolization may play a part. In our patient the radiologist used coils designed to close intracranial aneurysms. When introducing, their successive loops change direction evenly distributing themselves within the vessel and closing efficiently the perforation. Moreover, poly (glycolide-co-L-lactide) or nylon microfilaments reduces the flow and accelerate thrombosis [3]. Such approach allowed the patient to avoid open heart surgery, and enabled quick discharge.

REFERENCES


Figure 1. A. A long significant stenosis in proximal and medial RCA. B. A rotablation procedure. C. Stent optimization with deep location of the distal guidewire. D. Contrast extravasation. E. An example spiral coils used to close the perforation. F. The final view with coils implanted in the posterolateral branch of the RCA.

Abbreviation: RCA, right coronary artery