Successful treatment of extensive coronary artery dissection with cutting balloon

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A 70-year-old woman without chronic diseases was admitted to the hospital due to intense chest pain. An electrocardiogram (ECG) showed ST-segment depression in leads II, III, aVF, and V3–V6. She was transferred directly to the catheterization laboratory with a suspicion of acute coronary syndrome. Emergency coronary angiography revealed 90% stenosis in the left anterior descending coronary artery, while other vessels appeared normal (Figure 1A–B; Supplementary material, *Video S1*). Successful percutaneous coronary intervention under routine optical computed tomography guidance was performed. However, the procedure was complicated by cardiac arrest following the insertion of the guidewire through the narrowed segment, which required chest compressions to achieve spontaneous circulation return.

An hour later, she experienced a recurrence of chest pain, and ECG indicated new ST-segment elevation in leads II, III, and aVF. Repeat coronary angiography showed diminished antegrade flow in the right coronary artery (RCA) with a suspicion of coronary artery dissection extending from the ostium to the distal part of the vessel (Figure 1C; Supplementary material, *Video S2*). Intravascular

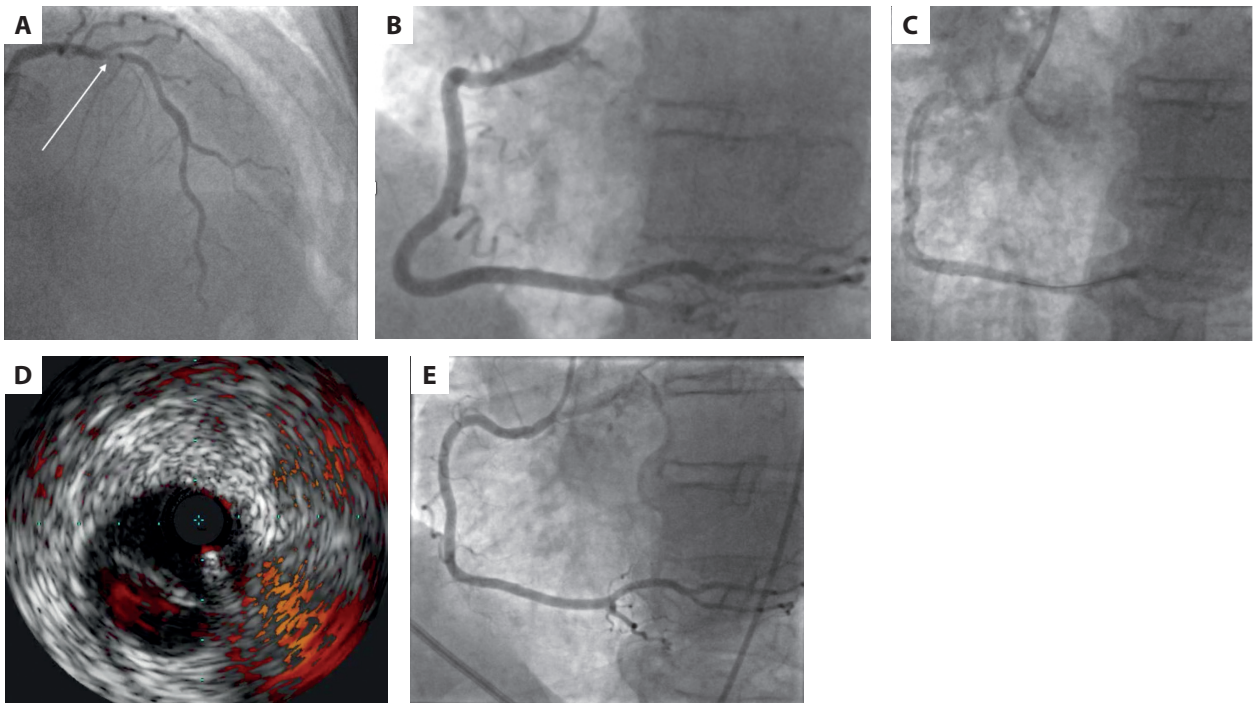

Figure 1. A. Significant stenosis of the proximal left anterior descending artery. **B.** Image of the normal right coronary artery on the initial coronary angiogram. **C.** Dissection of the right coronary artery from the ostium to the distal part on the control angiogram. **D.** Dissection of the right coronary artery confirmed on intravascular ultrasound. **E.** Image of the normal right coronary artery on follow-up coronary angiography

ultrasound-guided percutaneous coronary intervention was performed (Figure 1D).

Following the advancement of wires into the distal RCA, the patient reported relief from pain, and the ST segments returned to normal. However, intravascular ultrasound revealed that the guidewires were positioned within the false lumen (Supplementary material, *Video S3*). Despite numerous attempts, repositioning the wires into the true lumen proved unsuccessful. Consequently, a decision was made to proceed with cutting balloon angioplasty. Several inflations of the cutting balloon (Wolverine™ Coronary Cutting Balloon™, Boston Scientific, Boston, MA, US) from the crux to the RCA's ostium relieved the true lumen's pressure and restored optimal blood flow (Supplementary material, *Video S4*).

Throughout her hospital stay, the patient experienced alleviation of symptoms, ECG normalization, improvement of ejection fraction, and a significant reduction in troponin levels from 6887 ng/l to 213 ng/l (upper limit of normal 14 ng/l). She was discharged in stable condition with a recommendation for follow-up coronary angiography in two months which revealed a normal image of the RCA (Figure 1E).

The occurrence of chest pain along with ECG changes suggestive of acute coronary syndrome in a vessel that was previously imaged as normal should alert clinicians to the possibility of periprocedural complications. These may include, among others, coronary artery dissection, artery spasm, distal embolization, or inflow competition. A careful review of the initial angiogram revealed a proper, coaxial placement of the diagnostic catheter with relatively shallow catheter intubation. Nonetheless, in such situations, the possibility of an iatrogenic dissection induced by the diagnostic catheter remains. It is noteworthy that coronary artery dissections have been reported in association with prolonged cardiopulmonary resuscitation and blunt chest trauma [1]. However, in this case, the duration of resuscitation was comparatively short. Additionally, the potential for a concurrent spontaneous coronary dissection, often triggered by physical or emotional stress, should not be overlooked [2]. Therefore, the stress associated with the procedure itself may serve as a potential trigger. Regardless of the underlying cause, cutting balloon angioplasty offers a viable alternative to stenting for managing coronary artery dissections, preserving the option to treat the entire vessel length [3].

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/polish_heart_journal.

Article information

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