



Robotic-assisted PCI with Drug-Coated Balloon for severe LAD/D1 bifurcation stenosis

> Patient history

A 60-year-old male with a medical history of arterial hypertension, dyslipidemia, morbid obesity, and a positive family history of coronary artery disease (CAD) presented with dyspnea and CCS Class III angina on exertion. His cardiac history includes right coronary artery percutaneous coronary intervention (RCA-PCI) for ST-elevation myocardial infarction (STEMI) and left anterior descending artery percutaneous coronary intervention (LAD-PCI) in 2013, at which time his left ventricular ejection fraction (LVEF) was reduced to 40% due to ischemic cardiomyopathy.

> Diagnosis

Ambulatory myocardial perfusion scintigraphy revealed an anterior stress-induced ischemic burden of 10%. Echocardiography demonstrated a left ventricular ejection fraction of 47%, apical dyskinesia, and no valvular pathologies. The electrocardiogram indicated sinus rhythm, a heart rate of 66 bpm, and Q waves in leads II, III, and aVF. There was no elevation in troponin or CK-MB levels. Creatinine was 1.02 mg/dL. Coronary angiography suspected an RCA occlusion and identified severe ostial stenosis of the first diagonal branch (Ramus Diagonalis I, RD-I) and mild disease in the marginal branch (Ramus Marginalis, RM). CT coronary angiography showed no RCA stenosis and confirmed severe stenosis in the first diagonal branch.

> Management Strategy

Given the diseased ostium of the first diagonal branch (RD-I), characterized as a LAD/D1 bifurcation stenosis (Medina 0-0-1) (**Video 1**), and considering the LAD was provisionally stented (covering the RD-I ostium with the LAD stent, thereby complicating crossing and stenting procedures), a drug-coated balloon (DCB) application in the RD-I was chosen. This procedure utilized the R-One⁺ system for robotic-assisted percutaneous coronary intervention (PCI). It was decided not to intervene on the RM stenosis.

Robotic PCI performed by:



Principal operator

Michael Haude, MD, PhD
Rheinland Klinikum Neuss, Neuss,
Germany

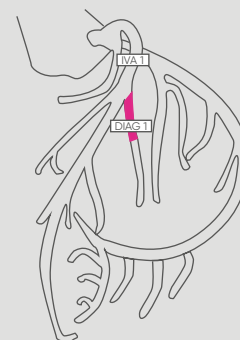


Second operator

Milad Golabkesh, MD
Rheinland Klinikum
Neuss, Neuss, Germany

> Lesion characteristics

- De novo lesion
- Type C lesion (ACC/AHA classification)
- DIAG1 (SB)
- Medina 0-0-1



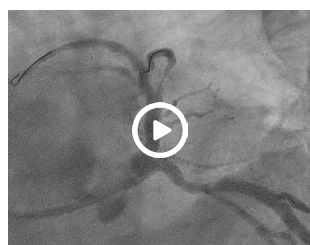
CASE STUDY



Video 1: Pre Angioplasty



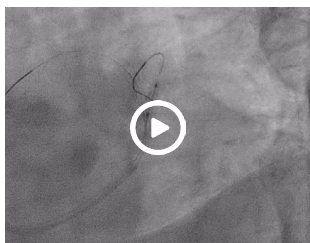
Video 2a: Robotic wiring of the LAD



Video 2b: After robotic wiring of the LAD and RD-I



Video 3: Robotic balloon positioning in the RD branch



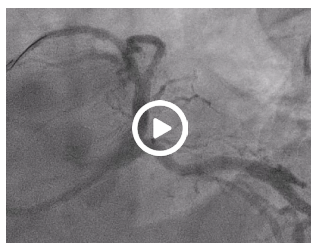
Video 4a: Robotic balloon dilatations in the RD



Video 4b: After robotic balloon dilatations in the RD



Video 5: Robotic-assisted DCB Therapy in the RD



Video 6: Final results

> Robotic-Assisted PCI Steps

After the LAD was wired robotically with a first guidewire, a second guidewire was similarly placed into the RD-I (**Video 2a, Video 2b**). Lesion preparation began with robotic positioning of a scoring balloon (2.5x10 mm) in the RD branch (**Video 3**), followed by pre-dilatations (**Video 4a, Video 4b**). Then a drug-coated balloon (2.5x20 mm) was robotically positioned at the lesion site (**Video 5**) to revascularize the RD Branch (**Video 6**).

> Procedure outcomes

The final angiography showed favorable results. Advancement, retraction, and positioning of all devices were successfully achieved by the R-One+™ system without any manual assistance. No complications occurred. The procedure duration was 29 minutes, with a total of 130 mL of contrast agent used. Furthermore, the primary operator's radiation exposure was 0 μSv as the entire procedure was performed from the control room outside of the catheterization laboratory. Post-interventional outcomes were uneventful. The patient was discharged on day 1 after the PCI procedure in stable condition with treated angina.

For more information, visit our [website](https://www.robocath.com) or contact our team: contact@robocath.com



BSI, CE n°MDR 763022

Results from case studies are not predictive of results in other cases. Results in other cases may vary. Indications, contraindications, warnings and instructions for use can be found in the product labelling supplied with each robotic platform and on the company website (www.robocath.com).

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