

**Usefulness of Tip Detection-Antegrade Dissection and Re-entry for Acute Myocardial Infarction
Secondary to Ostial Right Coronary Artery Dissection Following Chest Compressions During
Cardiopulmonary Resuscitation**

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A 79-year-old man with a history of inferior acute myocardial infarction (AMI) had previously undergone percutaneous coronary intervention (PCI) to the distal right coronary artery (RCA). Several days after the index PCI for AMI, he underwent PCI of the left circumflex artery for unstable angina. The procedure was complicated by guidewire perforation, requiring heparin reversal, followed by left main coronary artery thrombosis and hemodynamic collapse requiring VA-ECMO at the referring hospital. The patient was then transferred to our hospital for Impella implantation and intensive care management. Although he was successfully weaned from mechanical circulatory support, he developed sudden severe mitral regurgitation due to myocardial infarction-related papillary muscle rupture, resulting in cardiogenic shock. He underwent mitral valve replacement, and concomitant aortic valve replacement was performed because of intraoperative aortic valve injury during the mitral valve procedure.

On postoperative day 10, he experienced cardiopulmonary arrest due to airway obstruction. Return of spontaneous circulation was achieved after cardiopulmonary resuscitation with chest compressions and airway suctioning; however, his systolic blood pressure remained in the 50-mmHg range. A 12-lead electrocardiogram showed ST-segment elevation in the inferior leads. After initiation of VA-ECMO, emergency coronary angiography (CAG) was performed (DICOM 1 and 2). RCA angiography demonstrated an irregular, hazy total occlusion near the ostium.

A 7-Fr JR4 guiding catheter was engaged, but guidewire passage across the occluded segment was unsuccessful. Intravascular ultrasound (IVUS) revealed an ostial RCA dissection, with the guidewire located within the false lumen (DICOM 3 and 4). The true lumen was completely compressed from the RCA ostium, making conventional true-lumen wiring extremely difficult. Therefore, IVUS-guided tip detection-antegrade dissection and re-entry (TD-ADR) was attempted. The direction of the distal true lumen and the guidewire tip was identified using IVUS, and successful re-entry into the distal true lumen was achieved using a Conquest Pro 12 ST guidewire (DICOM5-8). Subsequent PCI resulted in successful revascularization of the RCA and restoration of coronary flow (DICOM9-10). Fortunately, the patient recovered and was transferred to a rehabilitation hospital 1 month later.

Coronary artery dissection following chest compressions during cardiopulmonary resuscitation resulting in AMI is exceedingly rare. This case demonstrates the potential utility of IVUS-guided TD-ADR as a bailout strategy when the true lumen is severely compressed and conventional true-lumen wiring is not feasible.