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Case Report

Coronary artery stent dislodgement and aortic dissection in a patient with a severely calcified lesion in the proximal right coronary artery

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ABSTRACT

In atherosclerosis progression, calcium deposition may have an impact on the natural history of coronary atherosclerosis, and the amount of calcium may affect the success rate of percutaneous coronary intervention (PCI). Coronary stent dislodgement does not commonly occur in the modern PCI era; however, it may lead to fatal death. If it occurs, retrieval of a dislodged stent can be performed either surgically or percutaneously using a variety of retrieval techniques, including inflating a catheter balloon distal to the undeployed stent, twirling 2 wires around the stent, a loop snare, or forceps. Here, we report a rare case that coronary artery stent dislodgement and aortic dissection simultaneously occurred during PCI for a severely calcified lesion in the proximal right coronary artery with shepherd's crook morphology. The situation was successfully rectified by using balloons to deploy the stent, as well as by applying an additional stent and minimizing the contrast used to treat aortic dissection.

Learning objective: During percutaneous coronary intervention (PCI), stent dislodgement and aortic dissection are extremely rare, but life-threatening complications. In this rare case of simultaneous stent dislodgement in the coronary artery and aortic dissection during PCI for a severely calcified lesion in the right coronary artery with shepherd's crook morphology, the situation was successfully rectified by using balloons to retrieve and deploy the stent, as well as by applying an additional stent and minimizing the contrast used to treat aortic dissection.

Introduction

Atherosclerosis progression involves inflammation and immune responses in all layers of the arterial wall [1], in which calcified coronary lesions can occur [2]. Calcium deposition impacts the natural history of coronary atherosclerosis, and the amount of calcium may affect the success rate of percutaneous coronary intervention (PCI) [3]. Here, we report a complicated case of severely calcified lesion in the proximal right coronary artery, which caused coronary artery stent dislodgement and aortic dissection.

Case report

An 84-year-old man, who had chronic heart failure, an abdominal aortic aneurysm, hypertension, and chronic kidney disease, was admitted to our hospital due to exacerbation of his chronic heart failure. Chest radiography showed cardiomegaly and pulmonary congestion (Fig. 1A-①), and electrocardiography demonstrated low voltage and V1-3 leads revealed poor R wave progression (Fig. 1A-③). Cardiac ultrasonography revealed dilation of the left atrium and ventricle, indicating the presence of pulmonary hypertension (estimated systolic pulmonary arterial pressure, 45 mmHg).

He was treated by adaptive support ventilation (ASV) with intravenous administration of human atrial natriuretic polypeptide (0.05 μg/kg/min), and intravenous administration of furosemide (40 mg/day). His dyspnea improved immediately after ASV treatment (Fig. 1A-②). Abdominal computed tomography (CT) scan showed a significant increase of abdominal aortic aneurysm (48–

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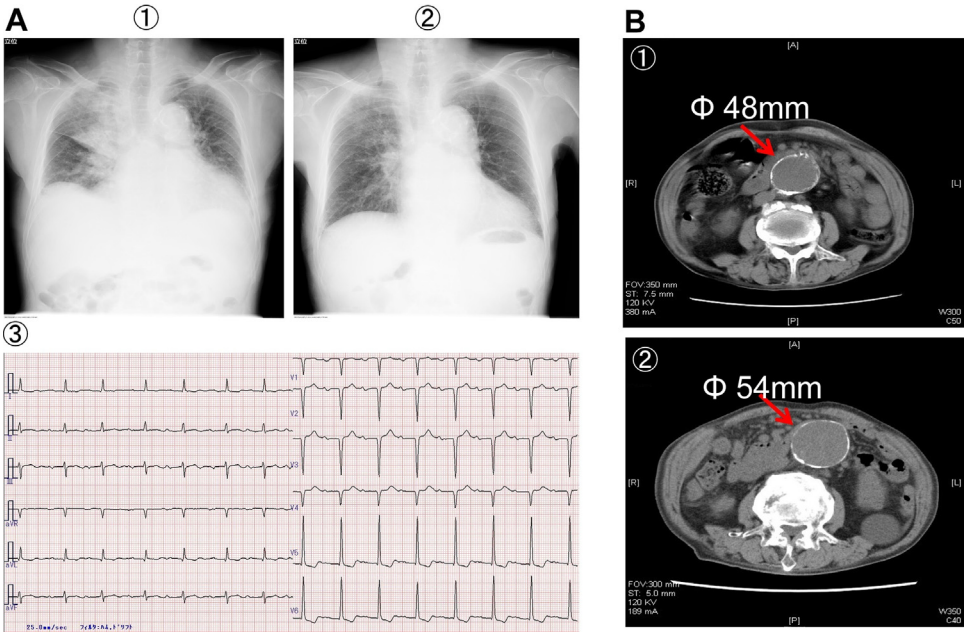

Fig. 1. **Chest X-ray, electrocardiogram, abdominal computed tomography scan** (A-①) Chest radiography examination showed cardiomegaly and congestion. (A-②) These immediately improved after the patient received adaptive support ventilation and treatment with diuretics. Electrocardiogram shows low voltage and V1–3 leads revealed poor R wave progression (A-③).
Abdominal computed tomography upon admission showed a significant increase in the size of the patient's abdominal aortic aneurysm from 48 mm (B-①) to 54 mm (B-②) in 3 months (arrows).

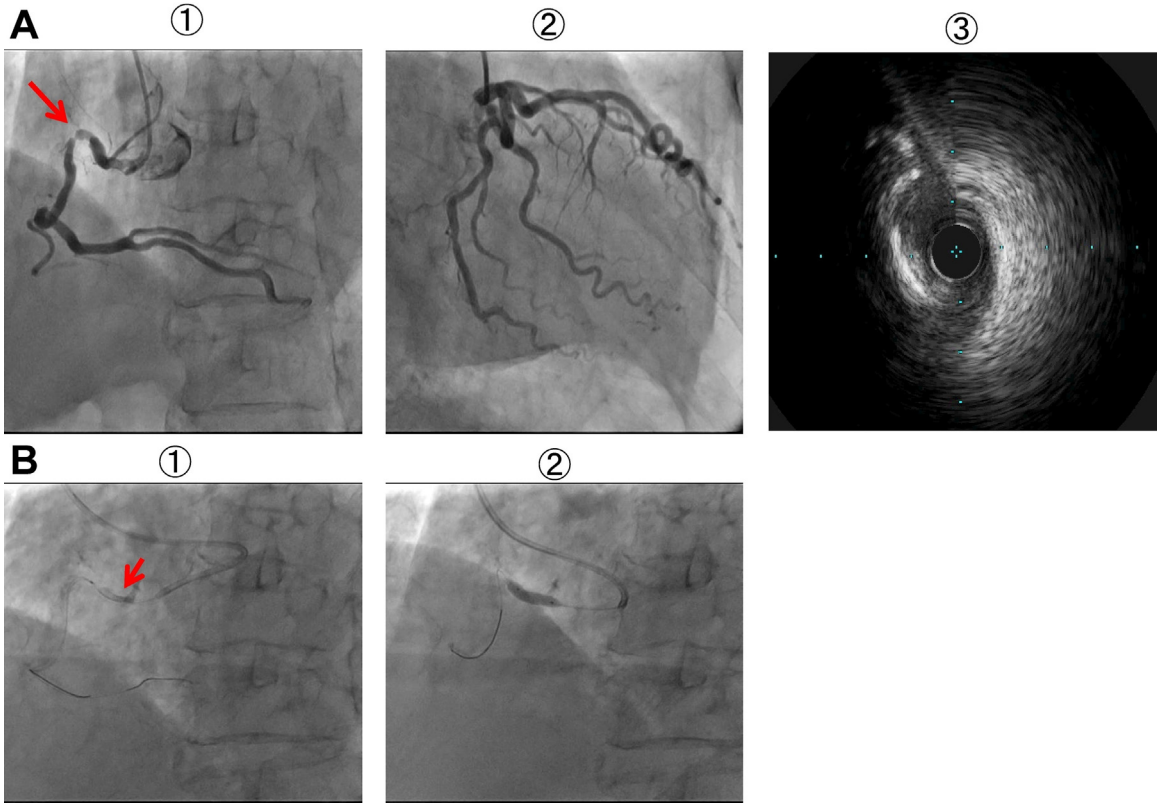

Fig. 2. **Coronary angiography** Coronary angiography showed single-vessel disease with 90% stenosis in segment 1 of right coronary artery (A-①, arrow). The left anterior descending artery and left circumflex artery were patent (A-②). Intravascular ultrasound detected circumferential severe calcification (A-③). The stent was dislodged near the target lesion in the coronary artery. At first, we advanced a second guide wire external and distal to the dislodged stent, and subsequently twisted the two guide wires several times to allow their distal ends to intermingle. However, we could not trap the dislodged stent (B-①, arrow). Place of the dislodged stent in the proximal portion of RCA segment 1 after dilatation with a 4.0 × 15 mm balloon (NC Euphora, Medtronic Inc.) (B-②).