Clinical vignette
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Aortic dissection involving ostium of right coronary artery as the reason of myocardial infarction
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A 66-year-old woman was admitted after an episode of faint with concomitant severe chest pain lasting ~2 h. Typical retrosternal localization of the pain with ST-elevation (Pardee wave) in leads II, III, and aVF, and ST-depression in I, V1–V3 allowed to diagnose acute infero-posterior myocardial infarction. ECG also revealed temporal second-degree atrioventricular block (Mobitz II). Blood pressure was 140/70 mmHg and HR was 55 b.p.m. No distinct murmur was heard on cardiac auscultation. In coronary angiography, left coronary artery had no significant stenoses. After placing the catheter in the ostium of RCA, no severe stenosis was seen and the flow was normal (TIMI 3, MBG 3). Just after selective cannulation of the RCA, chest pain diminished and ST-elevation recovered. Of note, during the peak of dye injection, the lumen was distended and collapsed at the end of the injection in the proximal segment of the artery. However, in coronary angiography, the lumen of RCA seemed not to be narrowed significantly (Panel A). To thoroughly assess the vessel, intracoronary ultrasound (ICUS) was performed. No evident atheromatous plaque was present in proximal part of RCA. During manual pullback, a hypoechoic mass adjacent to proximal segment of the artery was clearly seen (Panel B). The lumen in proximal segment and in ostium of RCA was impressed and narrowed by that mass (Panel C). Such hypoechoic mass parallel to the artery is not normally seen at this site. It was suspected that false channel existed and was propagated from the aorta to the proximal part of RCA. Therefore, dissecting aneurysm of the aorta was strongly suspected. It is important that almost immediately after withdrawal of a catheter from the ostium of RCA, the signs of acute myocardial ischaemia (i.e. severe chest pain and ST-elevation) relapsed. We thought that the catheter kept the lumen of RCA patent enabling restoration flow through the artery. Computed tomography (CT) fully confirmed our diagnosis of dissecting aneurysm—revealing long dissection extending from aortic valve up to the renal arteries with false lumen being partly thrombosed. CT showed patent left coronary artery and lack of patency of RCA (Panel D).

Comment: This case represents difficulties in diagnosis of aortic dissection. Acute myocardial infarction was diagnosed correctly but aetiology of myocardial ischaemia was not coronary artery disease as typical. In the presented case, information obtained from ICUS enabled to suspect aortic dissection involving ostium of RCA as the reason of acute myocardial infarction. The diagnosis was finally confirmed with CT.

Panel A. Coronary angiography: right coronary artery in RAO projection. Insignificant eccentric stenosis with smooth luminal border in the first segment of the artery.
Panel B. ICUS image: in the proximal segment of the RCA, intimal thickening and no atheromatous plaque is visible. Hypoechoic mass (white asterisk) adjacent to the RCA is present.
Panel C. ICUS image: hypoechoic mass (white asterisk) impressing and narrowing the ostium of RCA.
Panel D. CT image: true lumen (T) and false lumen (F) of aortic bulb, patent LCA (white arrow) and lack of patency of RCA (black arrow).