

Totally occluded left main coronary artery originating from right coronary artery in a patient presenting with STEMI and cardiogenic shock

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The incidence of coronary anomalies during coronary angiography is reported to be approximately 0.6–1.3%, but the incidence is much lower in patients undergoing primary percutaneous coronary angioplasty [1, 2]. Left main coronary artery (LMCA) originating from the right coronary artery (RCA) is a rare anomaly [3]. This coronary anomaly is associated with sudden death in children and young adults and rarely presents with acute ST elevation myocardial infarction (STEMI) in the elderly [4]. This situation can be clinically and angiographically challenging. Here we present a case of totally occluded left main coronary artery originating from the right coronary artery in a patient presenting with STEMI and cardiogenic shock.

An 81 year-old man presented at the emergency department with substernal chest pain, dyspnea and near syncope. Past medical history was significant for hypertension. His physical examination revealed systolic blood pressure of 72 mm Hg and pulse rate 92 bpm with deterioration in mental condition due to the low perfusion compatible with cardiogenic shock. The electrocardiogram showed sinus rhythm with ST elevation in aVR, aVL, V2 and diffuse reciprocal ST depressions in leads II, III aVF, V4 to V6 (Figure 1). The patient was transferred to a catheterization laboratory immediately under dopamine and norepinephrine infusion. Coronary angiography showed no coronary artery after left sinus injection (Figure 2). Right coronary angiography showed a normal RCA and totally occluded LMCA originating from the right coronary sinus (Figure 3). The anomalous left main coronary artery was cannulated with a JR 6 Fr guiding catheter. The lesion was crossed with a 0.014" floppy guide-wire and predilated with a 2.0 × 12 mm balloon. After predilatation a 3.0 × 23 mm drug-eluting stent was deployed. The stent was post-dilated with a 3.5 × 18 mm non-compliant balloon. Control angiography showed thrombolysis in myocardial infarction (TIMI) 3 flow in the LMCA, left anterior descending artery and circumflex artery (Figure 4). The patient did not require vasopressor support after the successful procedure and was transferred to the coronary care unit. The patient was discharged uneventfully on the fifth day of the hospitalization.

Coronary artery anomalies are most often asymptomatic and incidentally diagnosed on coronary angiography or autopsy [1]. Sometimes these anomalies can be observed during primary percutaneous interventions [2]. The left main coronary artery originating from the right sinus

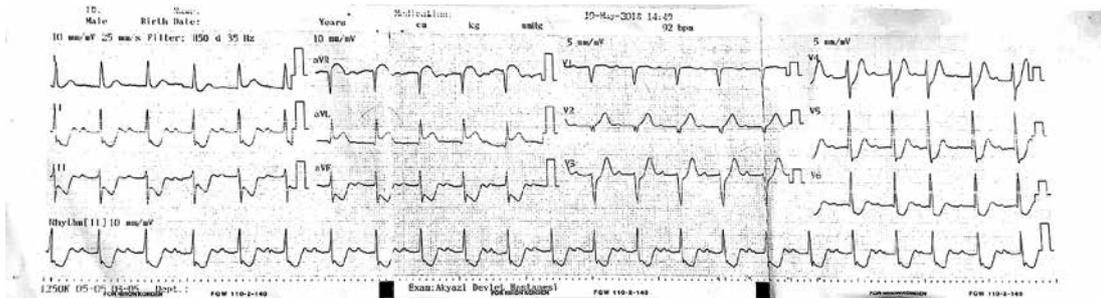


Figure 1. Electrocardiogram showing sinus rhythm with ST elevation in aVR, aVL, V2 and diffuse reciprocal ST depressions in leads II, III, aVF, V4 to V6

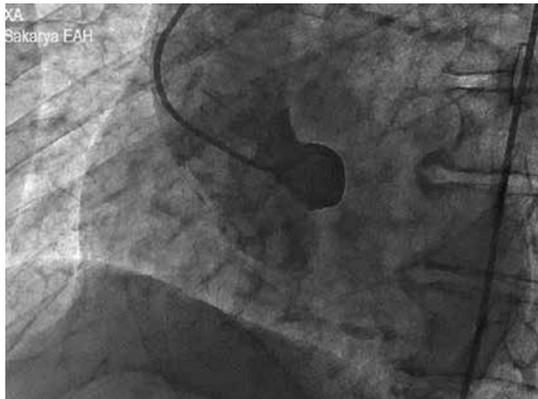


Figure 2. Coronary angiography showing no coronary artery after left sinus injection

Valsalva or right coronary artery is a much rarer anomaly [5]. The patients with anomalous left main coronary artery arising from the right coronary artery are generally asymptomatic, but the interarterial course between great vessels, aorta and pulmonary artery can cause sudden cardiac death by vascular compression or kinking, especially in young patients [6]. But rarely these cases may present as acute myocardial infarction in older ages. Coronary interventions in patients with anomalous vessels have rarely been reported [7]. These interventions are challenging and carry high procedural risks; hence proper techniques of intervention and selection of guiding catheters are important.

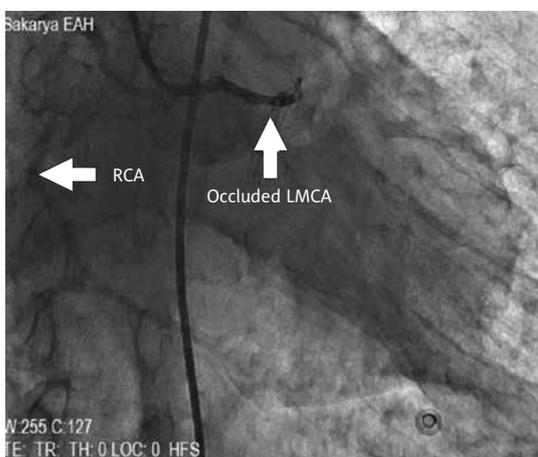
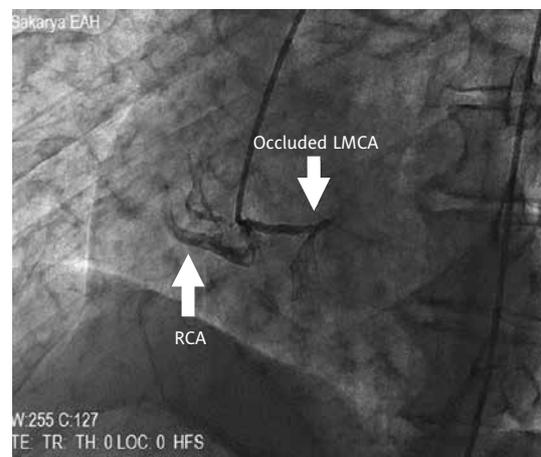
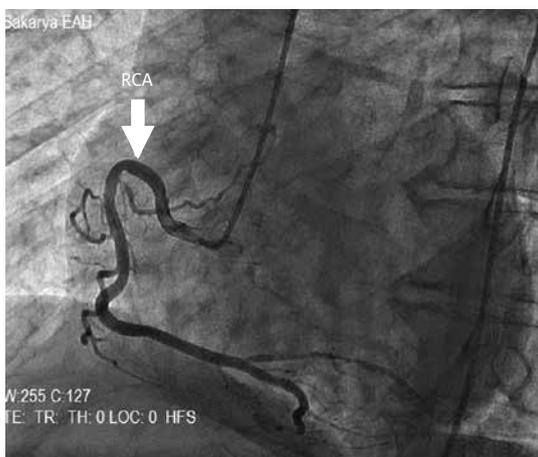


Figure 3. Right coronary angiography showed a normal right coronary artery (RCA) and totally occluded left main coronary artery (LMCA) originating from the right coronary sinus

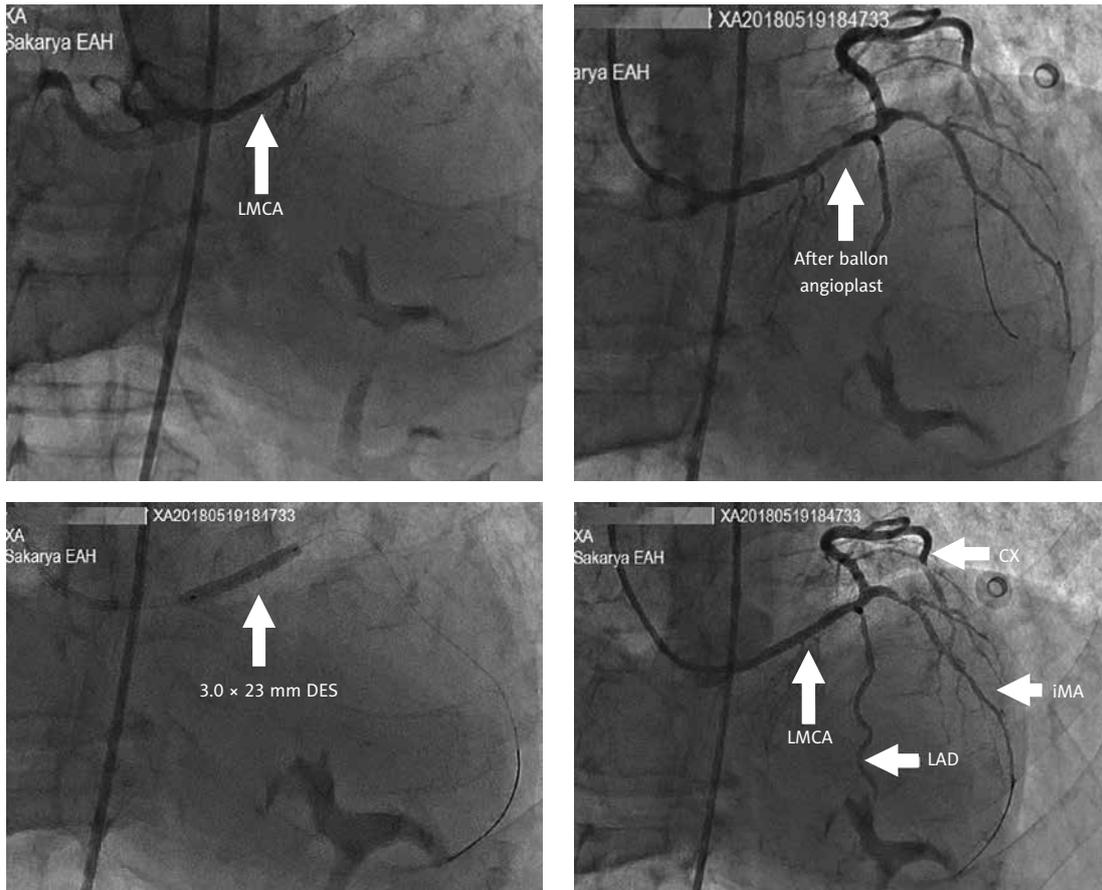


Figure 4. TIMI 3 flow in the left main coronary artery (LMCA), left anterior descending artery and circumflex artery after stent implantation

We presented successful treatment of a totally occluded left main coronary artery arising from the RCA. Coronary anomalies can be seen during coronary angiography and rarely during primary coronary interventions. In our case, total occlusion of the left main coronary artery may explain the cardiogenic shock. Clinical deterioration recovered after early revascularization. Although they are not so common, coronary anomalies should be kept in mind in primary percutaneous coronary interventions.

Conflict of interest

The authors declare no conflict of interest.

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