Acute Myocardial Infarction Caused by Left Main Coronary Artery Compression as a Result of a Mycotic Aneurysm of the Sinus of Valsalva

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An 83-year-old woman with a history of fever presented with severe chest pain progressing to cardiogenic shock. Her electrocardiogram showed evidence of anteroseptal myocardial infarction (MI). Urgent coronary angiography, with intra-aortic balloon pump support, indicated total occlusion of the left main trunk (LMT) (Figure 1A). Drug-eluting stents were successfully implanted from the LMT into the proximal left anterior descending (LAD) coronary artery (Figure 1C). Subsequently, computed tomography (CT) angiography was performed to understand the etiology of acute MI, because the LAD with no plaque was determined to be compressed from the outside, on the basis of pre-procedural intravascular ultrasound (IVUS) (Figure 1B, a to d). CT demonstrated a 4 × 3-cm aneurysm with a 1-cm-wide neck from the left sinus of Valsalva (SVA) causing external compression of the LMT (Figure 2). Because subsequent SVA rupture may have led to acute hemodynamic instability, early elective surgical treatment of the SVA was considered. Surgery (aortocoronary bypass surgery and aortic root reconstruction) was performed successfully and confirmed the presence of the SVA, which contained organized thrombus and pus, and was directly compressing the LMT. Because antibiotics were administered before surgery, acquired etiological factors were not detected. Echocardiography after the operation showed a normal aortic root with no aortic regurgitation, and left ventricular function had improved. The patient died as a result of deterioration of interstitial pneumonia 2 weeks after surgery.

Acute MI resulting from compression of the LMT associated with a left mycotic SVA is extremely rare, and often carries a poor prognosis (1–4). The proposed pathophysiological mechanism in this case was that the infective aneurysm of the left coronary cusp in the SVA may have caused weakness in the...
tunica media layer, leading to rapid expansion. This, in turn, may have precipitated the MI, as well as the cardiogenic shock. Both IVUS and CT can play an important role in achieving an accurate and rapid diagnosis.

**Fig. 1** Findings of Coronary Angiography and Intravascular Ultrasound

(A) Urgent coronary angiography showing total occlusion of the left main trunk (LMT) (white arrow). (B) Coronary flow remained limited even after the guidewire crossed over the culprit lesion (spider view). Intravascular ultrasound showed that the distal left anterior descending coronary artery (LAD) lumen was flattened, causing severe fusiform stenosis (d). Although the lumen of the LMT was not compromised (a), the proximal thorough midsection of the LAD was obstructed, as if compressed from the outside (b and c). (C) Thrombolysis In Myocardial Infarction flow grade 3 was obtained after stent implantation.

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