Echocardiographic imaging of saccular aneurysm in the left main coronary artery

A 59-year-old woman presented with a recent onset of dyspnea and chest pain. Past medical history and cardiovascular examination were completely normal. Electrocardiography demonstrated sinus rhythm with left bundle branch block pattern. Transthoracic echocardiography (TTE) revealed a slightly reduced ejection fraction with hypokinetic septal and anterior walls. Parasternal short-axis imaging displayed a small saccular echo-free space associated with the aorta, and no color flow turbulence was observed with color flow Doppler imaging (Fig. 1a). Subsequently, two-dimensional transesophageal echocardiography (2D-TEE) revealed a normal long-axis view and similar short-axis findings to transthoracic imaging. Real-time 3D-TEE (RT-3D-TEE) provided better imaging and indicated that the saccular body was a round-shaped small aneurysm that was relevant to the left main coronary artery (LMCA) take-off location (Fig. 1b; Video 1).

Aortography depicted a round-shaped saccular aneurysm, 8×9 mm in size, originating from the proximal LMCA that was approximately 2–3 mm next to the LMCA ostium (Fig. 2a; Video 2). Coronary angiography revealed an aneurysm associated with proximal LMCA (Fig. 2b; Video 3).

Although TTE can provide valuable information regarding the diagnosis of coronary aneurysm in pediatric patients with Kawasaki disease, its validity is limited in adults because of the declining image quality. Nevertheless, proximal segments of the coronary arteries can be assessed with TEE. RT-3-D-TEE can provide even better information regarding the location, size, shape, and relation to adjacent tissue in LMCA aneurysm, as in our case.

In this report, we presented an isolated saccular LMCA aneurysm diagnosed by echocardiography, which is rarely encountered in coronary angiography.

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Video 1. Real-time 3D transesophageal echocardiography showing small, saccular, proximal LMCA aneurysm at the level of the sinotubular junction
Video 2. Aortography showing saccular aneurysm originating from the proximal LMCA
Video 3. Coronary angiography showing proximal LMCA aneurysm and normal coronary arteries

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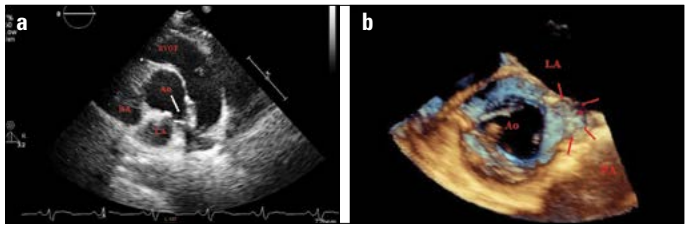

Figure 1. (a) 2D Transthoracic echocardiography parasternal short-axis image, from the slightly higher level of the aortic valve, displaying small saccular echo-free space (white arrows). (b) Real-time 3D transesophageal echocardiography showing small, round-shaped, proximal LMCA segment originated aneurysm (red arrows) in the diastolic short-axis image.
*represents. Ao- aorta; LA- left atrium; RA- right atrium; RV- right ventricle; LMCA- left main coronary artery; PA- pulmonary artery

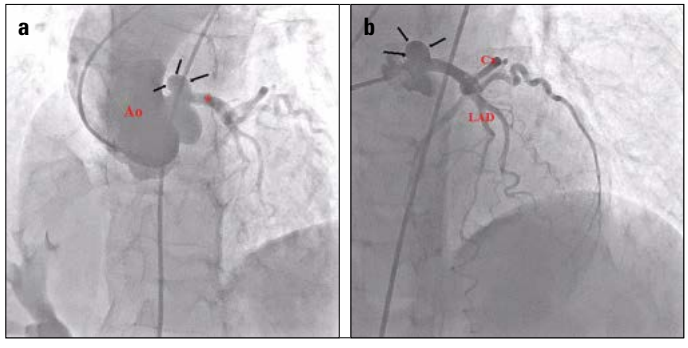

Figure 2. (a) A. Aortography showing a round-shaped, proximal LMCA-originated saccular aneurysm, 8×9 mm in size (Black arrows). (b) Coronary angiography showing proximal LMCA aneurysm (black arrows) and non-significant lesions in the coronary arteries.
*LMCA. Ao- aorta; Cx- circumflex artery; LAD- left anterior descending artery

Three-dimensional imaging of left ventricular hemangioma

A 30-year-old asymptomatic man with chronic hepatitis B was evaluated for an incidentally visualized intracardiac mass on abdominal ultrasonography. Two-dimensional (2D) transthoracic echocardiography (TTE) revealed a structurally normal heart except for the presence of homogeneously echodense, round, mobile mass (2.0×2.8 cm) within the left ventricular cavity (Fig. 1a, Video 1a). No flow abnormalities were detected with Doppler analysis. On three-dimensional (3D) TTE, the mass appeared to be attached to the interventricular septum (Fig. 1b, Video 1b). Transesophageal echocardiography (TEE) was performed for superior visualization of anatomical details of the mass. On 2D TEE imaging with xPlane, the mass was well-demarcated and attached to the interventricular septum with a faintly visible stalk, and there was no infiltration of the myocardial wall (Fig. 2a, Video 2a). On real-time 3D TEE, the surface

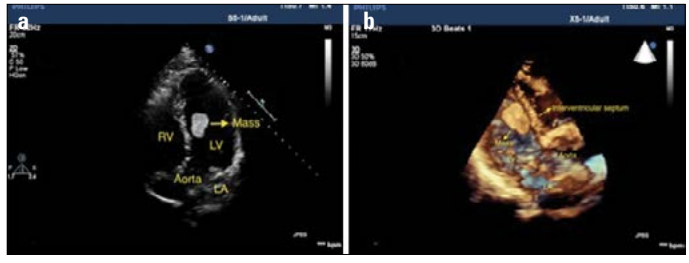

Figure 1. (a) Apical five-chamber view showing a homogeneously echodense, round, mobile mass within the left ventricular cavity. (b) Real-time three-dimensional transthoracic echocardiography showing a left ventricular mass and interventricular septum.

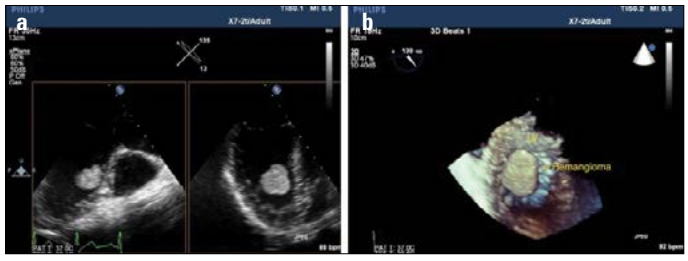

Figure 2. (a) Two-dimensional transesophageal echocardiography image with xPlane shows a faintly visible stalk of the left ventricular mass. (b) Real-time three-dimensional transesophageal echocardiography shows the surface of the mass as slightly irregular.

of the mass was visualized as slightly irregular (Fig. 2b, Video 2b). Surgical resection of the mass was performed, and histopathological examination revealed a mixed-type hemangioma with capillary and cavernous features.

Cardiac hemangiomas are extremely rare benign cardiac tumors accounting for only 2%–3% of all benign primary cardiac tumors. They can present at any age and can be located in any part of the heart and pericardium. 2D echocardiography is the primary imaging modality; however, 3D echocardiography is increasingly being used in routine practice, and it can be used as complementary imaging modality in the evaluation of cardiac masses. Real-time 3D TEE enables better visualization of masses and adds incremental value by characterizing the morphology of the tumor. It reveals the presence or absence of the echolucent areas, papillary excrescences, small tumor particles, and thrombus formation on the surface of the tumors. This case illustrates that 3D echocardiography is a helpful, noninvasive, and real-time technique that may provide better visualization of an unusual mass in the left ventricle.

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Video 1. a, b. (a) Apical five-chamber view showing a homogeneously echodense, round, mobile mass within the left ventricular cavity. (b) Real-time three-dimensional transthoracic echocardiography showing a left ventricular mass and interventricular septum.
Video 2. a, b. (a) Two-dimensional transesophageal echocardiography image with xPlane shows a faintly visible stalk of the left ventricular mass. (b) Real-time three-dimensional transesophageal echocardiography shows the surface of the mass as slightly irregular.

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