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Real-time three-dimensional echocardiography imaging of the main pulmonary artery pseudoaneurysm

A 20-year-old man with complaints of fever and chest pain visited the emergency department of our hospital. He was previously diagnosed with patent ductus arteriosus (PDA) in his early childhood, which was not treated. The patient had no history of catheterization or trauma. On arrival, his body temperature was 37.1°C, blood pressure was 109/56 mm Hg, pulse rate was 120 beats/min, and oxygen saturation was 97% on air. Bedside transthoracic echocardiography revealed a ductal diameter between the left pulmonary artery and aorta, which measured 0.7 cm, and a large mass adjacent to the dilated main pulmonary artery, with arterial blood flowing into it (Fig. 1a, b; Videos 1, 2). Real-time three-dimensional echocardiography provided valuable data regarding the shape of the pseudoaneurysm and its association with the pulmonary artery; the saccular outpouching was observed at the left of the pulmonary trunk, and the maximum width measured was 1.9 cm (Fig. 2a, b, Videos 3, 4). Chest computed tomography complemented echocardiography (Fig. 3). A diagnosis of PDA and main pulmonary artery pseudoaneurysm (PAP) was made. The patient expired 2 days after progressive decline in blood pressure.

PAP is an uncommon disease entity, most of which is caused by trauma, infection, and connective tissue disorders. PAP observed in the pulmonary artery trunk is rare because it shows a strong predilection for peripheral pulmonary arteries. Pseudoaneurysms do not involve all layers of the arterial wall, and the adventitia or adherent fibrous tissue contains the extravasated blood from vessel ruptures. We assume that in our case, the untreated large PDA played a role in PAP development.

Video 1, 2. Two-dimensional transthoracic echocardiography of the pseudoaneurysm.

Video 3, 4. Three-dimensional echocardiography of the pseudoaneurysm.

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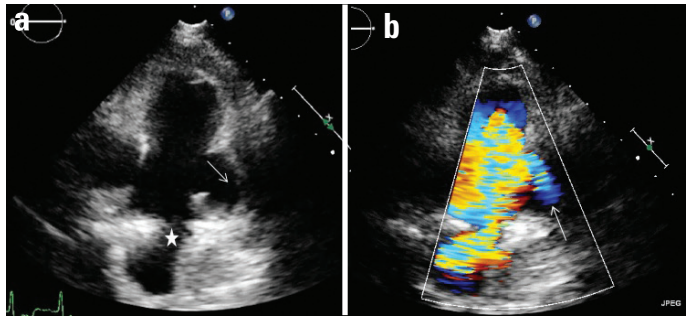

Figure 1. (a) Two-dimensional transthoracic echocardiography showed the patent ductus arteriosus (asterisk) and the pseudoaneurysm (arrow). (b) Color Doppler echocardiography demonstrated the blood flow from the pulmonary artery into the pseudoaneurysm (arrow)

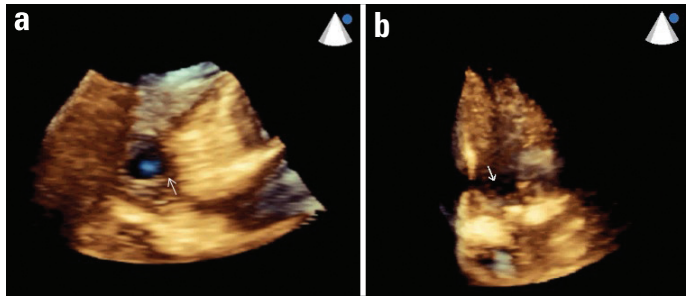

Figure 2. (a) The cross-section of three-dimensional echocardiography view of the pseudoaneurysm (arrow) from the pulmonary arterial perspective. (b) The longitudinal section of the pulmonary artery and the orifice of the pseudoaneurysm (arrow)

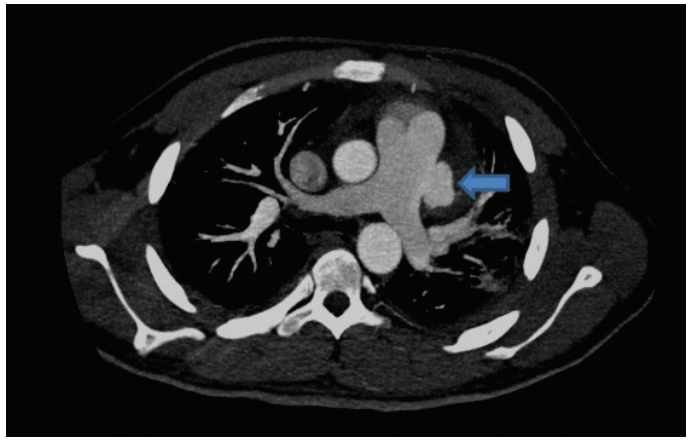

Figure 3. Computed tomography confirmed the association between the pseudoaneurysm (arrow) and the main pulmonary artery

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