Left ventricular outflow tract pseudoaneurysm occlusion with fusion of live 3-dimensional transesophageal echocardiography and fluoroscopy

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Three months after a Ross-Konno procedure, an 18-year-old male patient presented to his local hospital with wound swelling. He had been taking warfarin postoperatively as antithrombotic prophylaxis. Ten milliliters of coagulated blood was aspirated from the wound. One month later, he presented to our emergency department with recurrent swelling. Transthoracic echocardiography showed a pulsatile structure anterior to the aortic root and extending laterally (Supplementary material, *Figure S1A*). Computed tomography demonstrated a 2- to 3-mm opening at the junction between the left ventricular outflow tract and the neo-aortic valve, leading to a false lumen (6.6 × 1.5 cm), positioned on the left side of the aortic root (FIGURE 1A; Supplementary material, *Figure S1B*). This pseudoaneurysm was determined to be compressing the aortic root, right ventricular outflow tract, and main pulmonary artery (Supplementary material, *Figure S1C*). There was also a complex subcutaneous fluid collection (3.9 × 4.2 cm) anterior to the sternum.

Although no obvious connection could be identified, there was a concern for a tract between the aneurysm and the sternal wound. Under general anesthesia, with fusion of fluoroscopy and 3-dimensional transesophageal echocardiography (Supplementary material, *Figure S1D*) (EchoNavigator, Philips Healthcare, Best, the Netherlands), a target marker was placed to mark the entrance to the pseudoaneurysm arising from the anterolateral aspect of the left ventricular outflow tract (FIGURE 1B). This was used to position a guide catheter (FIGURE 1C) and then a coaxial microcatheter into the pseudoaneurysm, allowing deployment of 8 detachable coils, followed by a Medtronic Micro Vascular Plug device used to seal the neck (FIGURE 1D). Postdeployment angiography showed no flow into the pseudoaneurysm. The total fluoroscopy time and total radiation dose were 51.8 minutes and 340 mGy, respectively.

Transthoracic echocardiography showed normal left ventricular size and function and no flow into the aneurysm. A repeat chest computed tomography showed decreased fluid collections anterior to the sternum and posterior between the sternum and the descending aorta, with only residual soft tissue thickening.

Percutaneous treatment, is a viable alternative to surgery for closure of pseudoaneurysm.[1,2] The size and relations of the neck of the pseudoaneurysm are essential determinants for device selection. We have used the strategy of combining packing coils within the body of the pseudoaneurysm with Nitinol devices at the neck of the lesion.

Fusion of fluoroscopic and echocardiographic images on the same screen facilitates appreciation of anatomical relationships, in particular the orifice of the pseudoaneurysm and close proximity of the aortic valve.[3,4] Fusion of these images with fluoroscopy made cannulation of the neck of the pseudoaneurysm straightforward and facilitated stabilization of the delivery catheter during multiple coil and device deployment.

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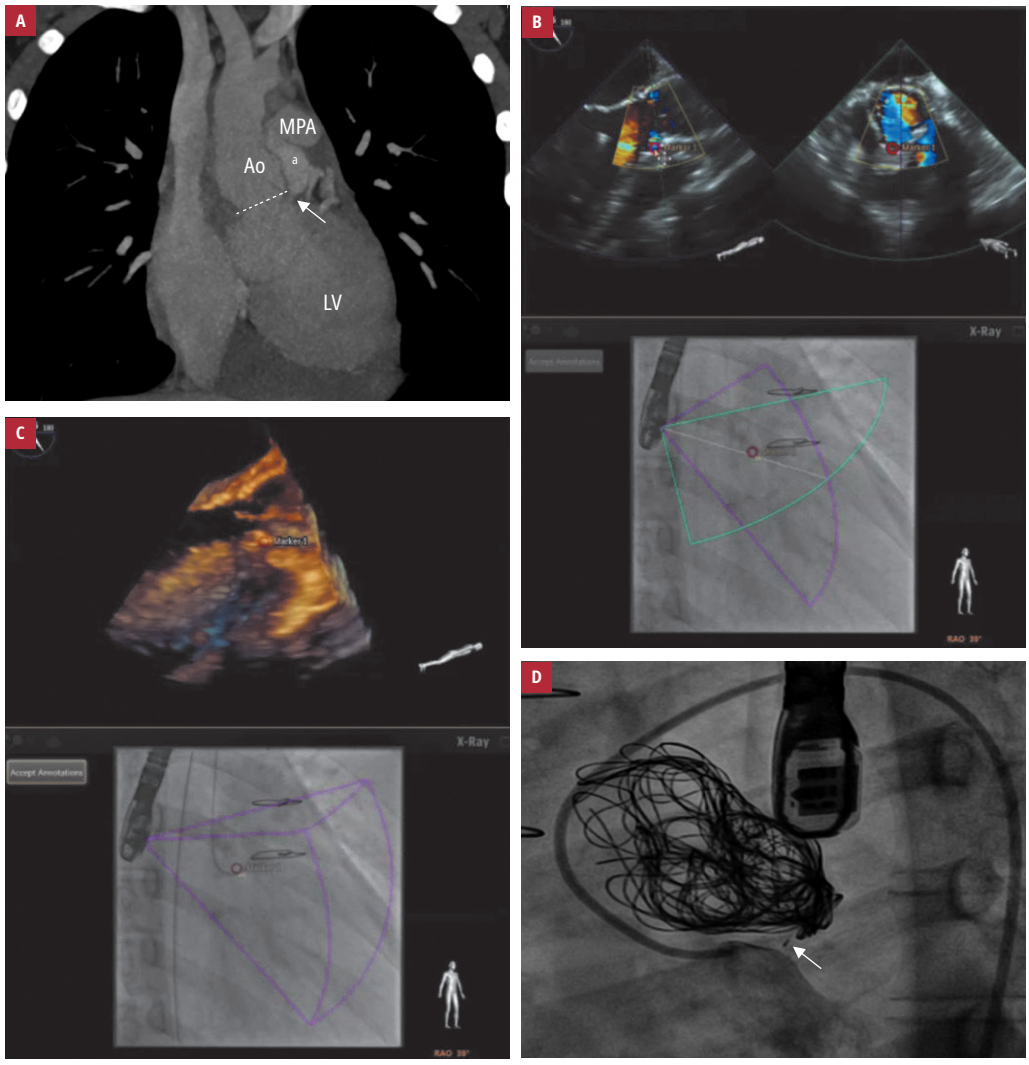

FIGURE 1 Computed tomography (**A**) revealing the pseudoaneurysm (**a**), with the neck (arrow) below the level of the aortic valve (dashed line). A marker was placed at the entrance to the pseudoaneurysm just below the level of the aortic valve and projected at the fusion screen (**B**). The marker facilitated cannulation (**C**) of the neck of the pseudoaneurysm, which was subsequently filled with coils and a Medtronic 0Micro Vascular Plug device (arrow) (**D**). Abbreviations: Ao, aorta; LV, left ventricle; MPA, main pulmonary artery

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/kardiologiapolska.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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