A 66-year-old woman was referred to our cardio-logic department to clear up an unusual cardiac mass being detected during routine outpatient trans-thoracic echocardiographic examination.

Initial cardiac magnetic resonance imaging (MRI) confirmed a mass located around the left ventricular posterior wall. Contrast enhancement of the structure was simultaneously to the thoracic aortic peak enhancement during dynamic MRI. However, the relationship of the lesion to the cardiac cavities and thoracic vessels remained unclear on MRI (see Supplementary material online, Video S1, right panel).

Therefore, a combined cardiac computed tomography (CT) angiography with a 4D CT volume perfusion acquisition was performed in order to define the exact vascular origin of the lesion (see Supplementary material online, Video S2). Cardiac 4D CT angiography found a ‘snooker-ball’-sized partly calcified arteriovenous malformation (AVM, maximum diameters, 5–7 cm) with antegrade vascularization from an enlarged circumflex coronary artery (CX, maximum diameter, 1 cm) (Panels A, C, and D). The arterial blood stream was directly drained into the enlarged coronary sinus (CS, maximum diameter, 9 mm). Most notably, the CS was compressed by the AVM to a minimum diameter of 2 mm (Panels B, E, and F). Supplementary material online, Video S3 demonstrates time-resolved contrast in sequence of the right heart chambers, left atrium and ventricle, finally contrasting the extended AVM and CS (also see Panels A and B).

Subsequently performed invasive coronary angiography showed no relevant coronary artherosclerosis. A coronary Runthrough guidewire (Terumo Cardiovascular Systems Corporation, USA) was advanced into the CX, passing the formation, finally reaching the CS (see Supplementary material online, Video S1, left panel).

This case highlights the usefulness of 4D cardiac CT angiography to reliably detect and differentiate cardiac tumors and vascular malformations.

Supplementary material is available at European Heart Journal online.