Title: Aortic root aneurysm with interventricular septal extension: a unique cardiovascular challenge

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Clinical presentation:

A 55-year-old male, previously healthy, presented in 2019 with dizziness and syncope. Diagnosed with 3rd-degree AV block, he underwent pacemaker implantation. A transthoracic echocardiogram (TTE) identified a deep recess/aneurysm originating from the right coronary cusp, at the base of the interventricular septum, along with thickening of the anterior aortic root wall and mild aortic regurgitation. A cardiac MRI confirmed a nondilated aorta with diffuse aortitis, involving the aortic cusps (especially the right coronary cusp), causing mild AR. A pseudoaneurysm-like defect was noted, extending into the base of the interventricular septum with a thin rim of late gadolinium enhancement (LGE) and a small thrombus. No shunt or perforation was observed. The patient was treated for Takayasu arteritis with prednisone and Tocilizumab, until 2022. Serial imaging showed stable aortic dimensions, though the aortic root recess gradually expanded into the interventricular septum between 2019 and 2022.

Imaging findings:

In February 2024, the patient presented to the emergency department (ED) with retrosternal chest pain. A TTE showed an echolucent area expanding from the aortic root in front of the right coronary cusp into the interventricular septum towards the inferoseptal and inferior walls. The size of the pseudoaneurysm was 50 mm x 21 mm, with no shunt or fistula. A CT coronary scan confirmed the progression of the pseudoaneurysm.

Summary:

In this case, an initial TTE raised suspicion for a large vessel arteritis and identified an aneurysm at the aortic root level extending into the interventricular septum. This first imaging, along with complementary scans and MRIs, played a crucial role in the patient's management, as he was treated for Takayasu arteritis and closely monitored over the years. When the patient presented to the ED with new chest pain, a follow-up TTE revealed the progression of the aortic root aneurysm into the interventricular septum, leading to a successful aortic root repair with a pericardial patch. Through a patient-centered approach, echocardiography along with multimodality imaging were key in tracking the patient's condition and guiding his treatment.



Figure 1. Echocardiography images showing the aortic root aneurysm trough the interventricular septum.