Clinical History:

A 64-year-old woman with history of severe aortic valve stenosis, accompanied with aneurysmatic dilatation of ascending thoracic aorta. She complained of atypical chest pain that worsened during the past few months.

Imaging Findings:

Cardiac diverticulum look like diverticula elsewhere in the body, as tubular structures originating from the endocardium, bulging against the myocardium. It is important to be aware of their presence and make multiplanar reconstructions (MPR) to correctly characterize them. In this case the CT study depicted a subaortic diverticulum originating from the left ventricle. There was no communication between the left and right ventricles (no contrast going through the diverticulum). The diverticulum neck measured 7 mm and the depth was 9 mm. There was a calcified bicuspid valve. The ascending aorta was dilated. The ascending aortic diameter measured from adventitia to adventitia was 4.5 cm.

Discussion:

A. Background: Ventricle diverticulum is an exceptional radiological finding. There are very few cases reported in the medical literature. An approximate incidence of 0.4% cases in post mortem studies has been demonstrated [1, 2].

B. Clinical Perspective: It could be an isolated and incidental finding, but it is well known that almost half of the cases are accompanied by other middle thoracoabdominal malformations [2, 3]. Bicuspid aortic valve is one of the cardiac malformations that has been related to this finding [2, 3]. The onset of complications may be accompanied by the appearance of symptoms. These complications could be thrombosis, embolism, cardiac rupture, congestive heart failure, ventricular arrhythmias, or valvular abnormalities [4].

C. Imaging Findings: Cardiac diverticulum is an outpouching structure that contains endocardium, myocardium, and pericardium and contracts with systole [5]. It looks like a tubular structure originating in the endocardium, bulging against the myocardium. They are narrow-mouthed with a wide outpouching, extending beyond the confines of the anatomic ventricular cavity and myocardial margin [6]. These morphological features help to differentiate them from other congenital findings, like clefts [6]. It is important to be aware of their presence and make multiplanar reconstructions (MPR) to correctly characterize them.

D. Outcome: The treatment options vary between different institutions. Some surgeons promote an early surgical
excision for all diagnosed cardiac divertica [7]. Other physicians support a more conservative management of this pathology, with close follow-up, indicating surgical intervention based on the clinical condition of the patient and the associated abnormalities [7].

E: Take Home Message, Teaching Points: Although cardiac diverticulum is an extremely uncommon finding in imaging, the radiologist needs to be aware of its presence especially in patients with congenital cardiac disease. Some authors have related the presence of diverticulum with HCM; further research is needed. The treatment of this finding has not been well established, and it mainly depends on the clinical situation of the patient.

Differential Diagnosis List: Congenital subaortic diverticulum, Ventricular septa rupture, Ventricular aneurysm, Myocardial cleft, Ventricular pseudoaneurysm

Final Diagnosis: Congenital subaortic diverticulum

References:


Figure 1

Description: (A) Sagittal Multiplanar reconstruction (MPR) that shows a bicuspid and calcified aortic valve. Origin: HCUVA
Figure 2a

Description: (B) Axial MPR where the ascending thoracic aorta appears expanded. Origin: HCUVA
Figure 3

Description: Axial MPR showing the subaortic valve diverticulum (arrowhead) and the bicuspid aortic valve with calcifications (arrow). Origin: Hospital Universitario Virgen de la Arrixaca
Description: Sagittal MPR showing the relationship between the subaortic valve diverticulum (arrowhead) and the bicuspid aortic valve with calcifications (arrow). Origin: Hospital Universitario Virgen de la Arrixaca