Caseous calcification of the anterior mitral leaflet: an unusual presentation of a rare pathology-role of 3D TEE

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The pre-angiogram trans-thoracic echocardiogram in a 79-year-old male identified a large bright mass involving the anterior mitral leaflet (AML) (Figure 1A), associated with significant regurgitation. Coronary angiography revealed left anterior descending artery disease.

Transoesophageal echocardiography (TOE) confirmed the presence of a mass with a soft, hypoechogenic core with mobile debris (Figure 1B) but anatomical details were not clear with two-dimensional (2D) images. Three-dimensional (3D) reconstruction showed the mass to encompass most of the AML with a layered distribution over the atrial side and, on the ventricular side, a distinct bulge with a cyst-like cavity (Figure 1C–E, see Supplementary data online, Videos S1 and S2).

The patient underwent successful CABG and MVR due to the severity of the mitral regurgitation. At surgery, the anterior leaflet was heavily calcified. AML incision resulted in oozing of a thick, caseous material. Histology showed dystrophic calcification and acellular, amorphous, basophilic substance, mirroring the caseous material seen intraoperatively.

Mitral caseous calcification is extremely rare, being reported in 0.07% of echocardiographic studies, with the posterior annulus being typically involved. To our knowledge this is only the second reported instance of this condition involving the anterior mitral valve leaflet. Preoperative 3D TOE was instrumental in clarifying that the atrial side of the AML was encased in the calcific mass and that the cystic cavity was localized on the ventricular aspect. As shown by this case, anterior mitral leaflet caseous involvement is possible and should be considered in the differential diagnosis of calcific masses with a soft core, detected on the AML. 3D TOE can be critical in clarifying the anatomy in unusual cases.

Figure 1: Anterior mitral leaflet caseous calcification: TTE and 2D and 3D TOE findings. (A) TTE diastolic frame in apical four-chamber view: the anterior mitral leaflet (arrows) appears included in a dense calcific mass. The posterior annulus is spared. (B) Zoomed TOE 2D echocardiographic diastolic frame in mid-oesophageal position: a dense linear calcification (short arrows) extends from the aortic valve to the body of the anterior mitral leaflet, on the atrial aspect; a cystic cavity with debris (long arrows) is present on the ventricular side. LA, left atrium, LV, left ventricle. (C) 3D TOE atrial view: Pre-eminent calcified thickening (long arrows) extends from the aortic valve to include most of the basal AML. A localized area of thickening (short arrows) is seen at the site of the cystic cavity. (D) 3D TOE ventricular view: a well defined (arrows) cavity is present at the postero-medial aspect of the AML. (E) In the same view as for (A), the cystic cavity nature of the ventricular side AML mass (arrows) is demonstrated by moving the frontal 3D plane until it cuts through the MV mass.

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.