Excessive movement of the coronary sinus lead of CRT-D and severe tricuspid regurgitation

A 24-year-old male patient who had a cardiac resynchronization therapy device (CRT-D) implanted 2 years prior was admitted to our clinic with bilateral pretibial edema and abdominal ascites. Transthoracic echocardiography showed severe decreased left ventricular systolic function with an ejection fraction of 20% and mild-to-moderate mitral regurgitation. In addition, in the transthoracic echocardiography modified apical 4-chamber view, the coronary sinus (CS) lead of CRT-D showed excessive movement and it was acrossed the tricuspid inflow, and severe tricuspid regurgitation but without obstruction of the tricuspid valve closing was observed (Fig. 1a and 1b, Video 1 and 2). On modified parasternal short axis and 3-D image from the apical 4 chamber view, excessive movement of the CS lead was displayed (Fig. 1c and 1d, Video 3 and 4). Excessive movement of the lead toward the tricuspid inflow was seen during diastole, and tricuspid regurgitation was seen during sistole. Therefore, severe tricuspid regurgitation mechanism was not be caused by CS lead, and the patient had been followed up by medical treatment.

Tricuspid regurgitation in patients with permanent pacemakers may not be exclusively caused by the endocardial lead as pre-existing abnormalities, such as tricuspid valve annular dilatation or pulmonary hypertension, may be present. The mechanism of tricuspid regugirtation plays an important role in the choice of treatment. If tricuspid regurgitation caused by the endocardial lead is managed by surgery, medical treatment is needed for other reasons. Defining the precise anatomical relationship between the tricuspid valve and the pacemaker lead is important for understanding the underlying tricuspid regurgitation mechanism.

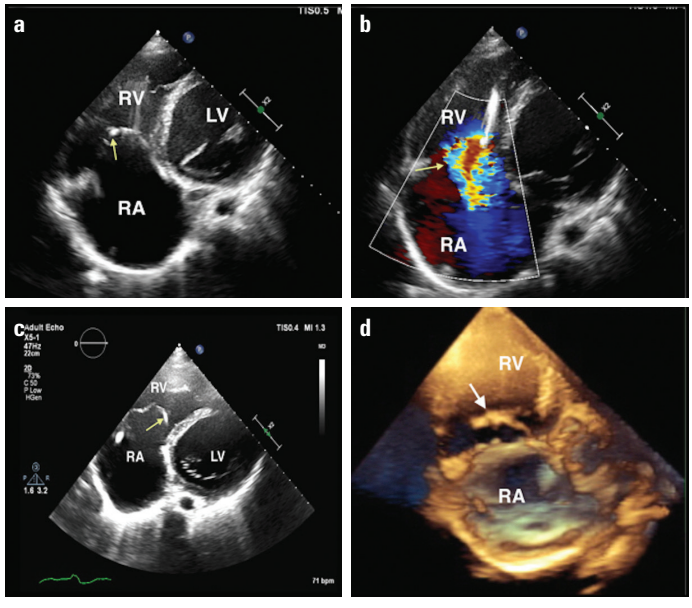

Figure 1. (a) Transthoracic echocardiography modified apical 4 chamber view shows excessive movement of the CS lead of CRT-D (arrow). (b) Transthoracic echocardiography apical 4 chamber view shows severe tricuspid regurgitation (arrow). (c) Transthoracic echocardiography modified parasternal short axis view shows excessive movement of the CS lead of CRT-D (arrow). (d) Transthoracic echocardiography 3-D image from the apical 4 chamber view shows excessive movement of the CS lead of CRT-D (arrow)

Video 1. For Figure 1a
Video 2. For Figure 1b
Video 3. For Figure 1c
Video 4. For Figure 1d

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Cardiac calcified amorphous tumor originating from the aortic valve: A rare case report

A 74-year-old female complained of chest tightness for >10 years. Out-patient transthoracic echocardiography (TTE) revealed a hyper-echogenic mass at the aortic root and mild tricuspid valve regurgitation. TTE was performed again which showed details of the mass: an approximate 15×10 mm irregular and lobulated mass above the non-coronary cusp without interfering with the aortic valve (Fig. 1a, 1b). Preoperative cardiac magnetic resonance imaging (MRI) and contrast-computed tomography (CT) both identified the signal of the soft tissue in the non-coronary sinus (Fig. 1c-1f, arrows). Surgical removal of the tumor with or without aortic replacement was agreed by patient and medical team.

The aorta was cross-clamped followed by the routine aortic incision. The aortic valve was exposed, and the tumor was found to be connected to the non-coronary cusp with a thin peduncle (Fig. 2a, 2b). The tumor was completely removed from the cusp without destroying the cusp. The function of the aortic valve was completely preserved.

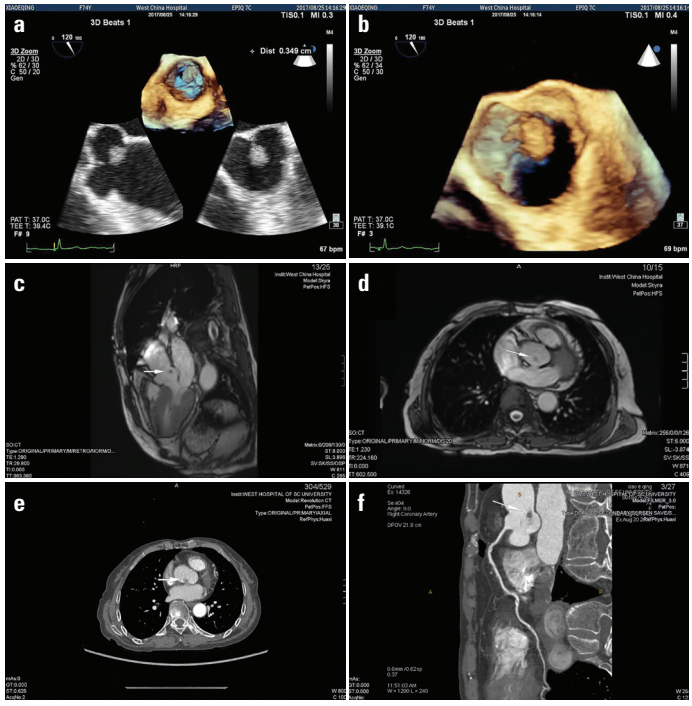

Figure 1. 3D transesophageal echocardiography images (a, b) and cardiac magnetic resonance imaging (MRI) and contrast-computed tomography (CT) images. (c, d) Sagittal and transverse planes of cardiac MRI images of the cardiac CAT in the non-coronary cusp (arrows point out cardiac CAT). (e, f) Transverse and sagittal planes of contrast CT images of cardiac CAT in the non-coronary cusp (arrows point out the cardiac CAT)

Postoperatively, the patient was transferred to the cardiac intensive care unit and then discharged on postoperative day 7. Hematoxylin and eosin (H&E) staining images showed calcification and eosinophilic amorphous material in the dense collagenous fibrous tissue (Fig. 2c-2e). The diagnosis was confirmed as cardiac calcified amorphous tumor (CAT). On the 6-month follow-up, the patient was doing well and no recurrent tumor was found.

In summary, our case report presented a patient with an extremely rare cardiac CAT that originated from the non-coronary cusp of the aortic valve and who underwent complete surgical removal of the tumor with preserved aortic valve function.

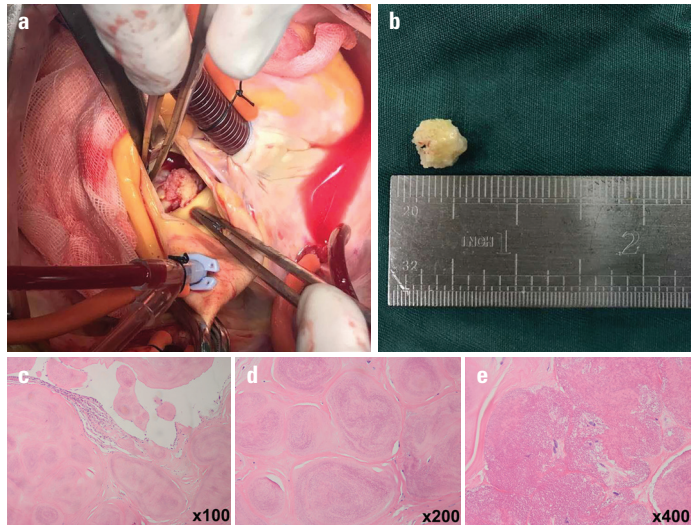

Figure 2. Intraoperative image and gross pathological photo of cardiac CAT (a, b) and hematoxylin and eosin (H&E) staining images of the removed cardiac CAT (c, d) (magnifying 100, 200 and 400 times)

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