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Case Report

CASE REPORT

An unusual cause of lacunar infarcts: Lambl's excrescences on aortic valve shown in detail by 3D transesophageal echocardiography

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Abstract

Lambl's excrescences (LE) are rare cardiac structures. They are associated with catastrophic thromboembolic and coronary events. Despite resulting in such important events, 2D echocardiographic imaging modalities may overlook LE owing to very thin cardiac structures. So, 3D echocardiographic imaging modalities may fully offer this cardiac mass and provide us to more accurately guess the complication rate related to LE due to the fact that 3D echocardiographic imaging techniques have higher spatial resolution and are not based on the geometric assumption. Indeed, another benefit of 3D echocardiographic imaging modalities in this population is that these imaging modalities clearly provide the relationship to adjacent structures of LE and its movement over a cardiac cycle in 3D space. In our case report, we aim to present the usefulness of 3D echocardiography as a modality to clearly offer all features of LE, furthermore to give valuable information about management in patients with thromboembolic events leading to LE.

INTRODUCTION

Lambl's excrescences (LEs) are usually described as threadlike fronds [1], and LEs are rare cardiac structures [2]. LE occurs along valve closure lines where minor endothelial damage promotes thrombus formation [1]. LE itself or thrombus formation on the LE can be linked to catastrophic clinical courses including cerebral embolism and coronary artery obstruction [2, 3]. Despite resulting in very significant clinical conditions, there has not been a sufficient evidence in the literature regarding the management of LE complications due to the fact that the management is at the level of case reports [4]. Herein, we present a case of 68-year-old man with lacunar infarcts resulting from LE on the aortic valve definitely determined by 3D transesophageal echocardiography (TEE). Additionally, we aim to contribute to the optimal management of LE with respect to defining the possibility of thromboembolic events of LE by 3D TEE.

CASE REPORT

A 8-year-old man was admitted to our emergency department presenting with decreased consciousness and speech disorder. No significant underlying comorbidities were present. His first neurological examination revealed a Glasgow Coma Scale score of 10 with inappropriate words on arrival at the emergency department. His blood pressure was 160/90 mm hg, respiratory rate 15/min, body temperature 36.7°C and SO_2 by pulse oximetry 96% on room air. Cardiac and respiratory examinations were unremarkable. His laboratory results including renal and hepatic function tests, level of Creatine kinase-myocardial band (CK-MB) and troponin I, complete blood count, coagulation tests and level of protein C, protein S and homocysteine and rheumotologic tests were within normal values. His baseline electrocardiography (ECG) showed sinus rhythm and heart rate of 72 bpm. Brain computed tomography ruled out intracranial hemorrhage, and diffusion magnetic resonance imaging revealed an acute

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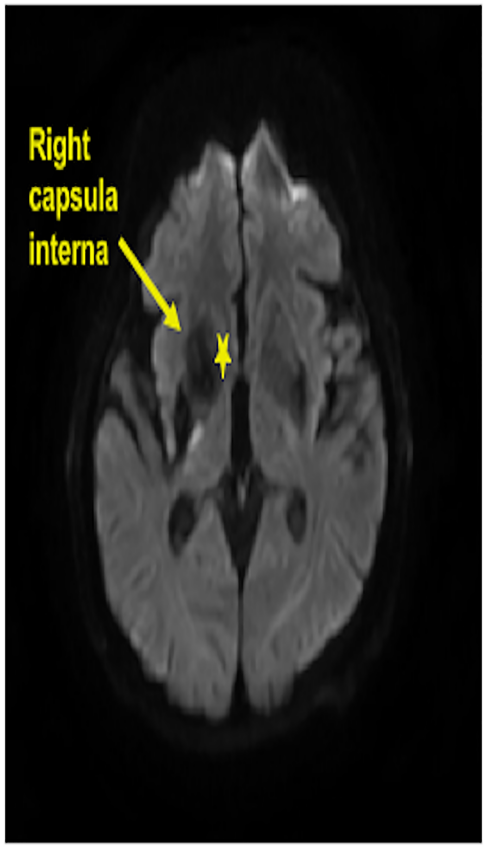

Figure 1: Diffusion magnetic resonance imaging showed an acute ischemic infarction at the right capsula interna.

ischemic infarction at the right capsula interna (Fig. 1). Carotid Doppler ultrasonography revealed no significant obstruction and no plaque formation. After the probable causes of neurovascular factors for stroke were excluded, the cardiologic consultation was held by neurology department. His intensive care unit (ICU) ECG monitoring during his ICU stay which was a total time of 48 hours and subsequent 24-hour Holter ECG excluded the cerebrovascular accident caused by paroxysmal atrial fibrillation. Although 2D transthoracic echocardiography (TTE) revealed normal echocardiographic findings, 2D TEE showed a mobile fibrillar tissue (8.42 mm) which is attached to the aortic valve (Fig. 2) and revealed no thrombus formation in the left atrial appendage. The live X-plane imaging showed the presence of filamentous structure attaching to the left coronary cusp of the aortic valve (Video 1, Fig. 3), as well as there was no evidence of intracardiac vegetation and thrombus formation. 3D TEE allowed the clear and complete visualization of LE. Two masses were seen at the line of either the right coronary cusp or left coronary cusp. Indeed, each mass was seen as very thin filiform strands and had an irregular shape and mobility. In the modified image of the aortic valve, each mass was very close to the coronary artery ostium but did not occlude it (Fig. 4). In addition, each mass had a fibrous tissue appearance, and during cardiac cycle, each mass protruded into the ascending aorta (Video 2). The image was cropped with manual tracing of the mass borders, and the area of the mass was calculated by cropping analysis. The mass area was 74.8 mm^2 (Fig. 5). The patient was diagnosed with LE due to the mass having fibrous imaging characteristics, a narrower pedicle and smaller size than fibroelastoma and being present

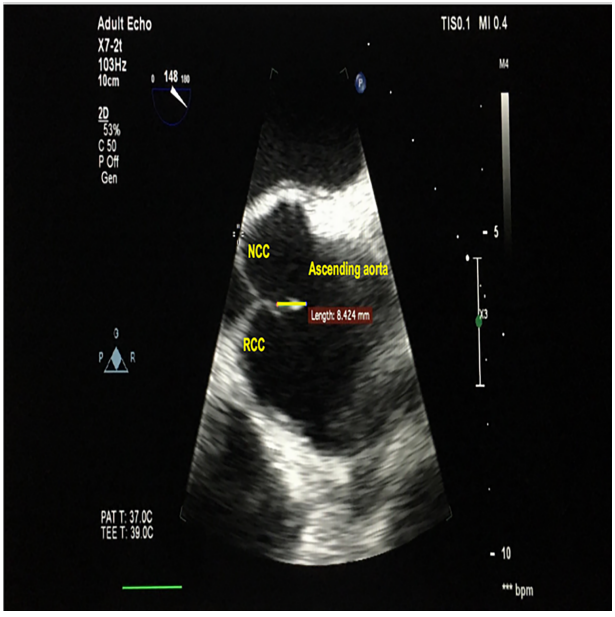

Figure 2: 2D TEE depicted the length of fibrillar tissue is 8.42 mm.

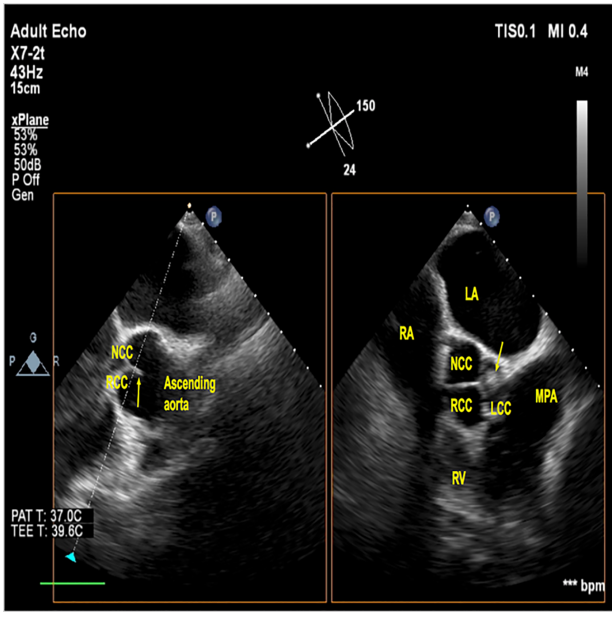

Figure 3: X-plane imaging depicted a mass on the left coronary cusp.

on the aortic surface of the valve. After the diagnosis, full-dose anticoagulation was indicated by the heart team due to the first embolic attack of the patient, the small volume of the mass proven by 3D TEE, its movement during a cardiac cycle and the mass which did not occlude the coronary artery ostium. The patient's International Normalized Ratio (INR) was monitored and aimed for the target of 2–3.

DISCUSSION

The very thin structure of LE results in poor sensitivity and specificity of 2D-TTE, so they have been mostly detected by TEE. The sensitivity and specificity of 2D TEE for LE increase by up to 68 and 85%, respectively [5]. However, the relationship between

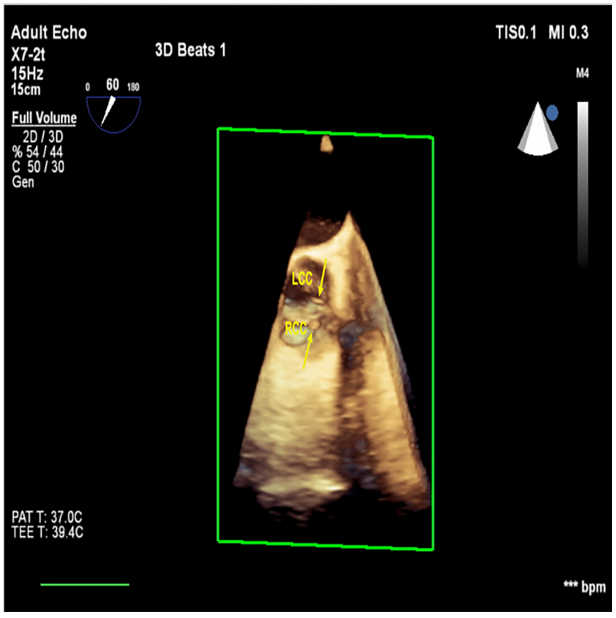

Figure 4: 3D TEE imaging depicted fibrillar structures attached on both of the left coronary cusp and right coronary cusp.

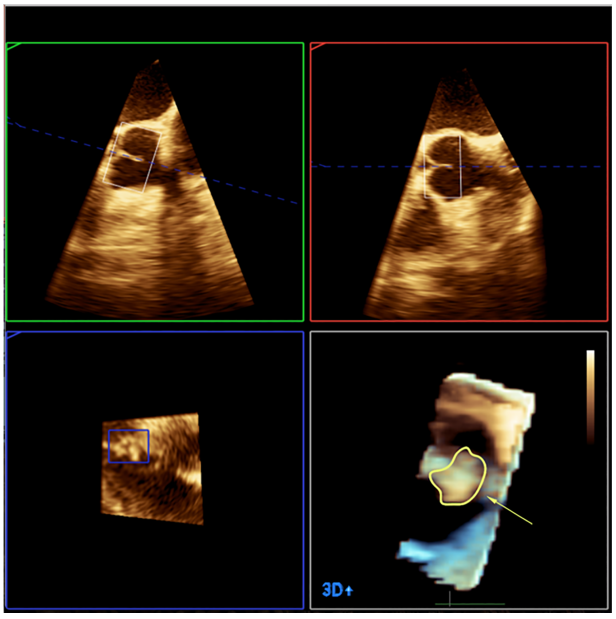

Figure 5: Cropping analysis provided the mass area which was 74.8 mm^2.

LE and the specificity and sensitivity of 3D echocardiographic imaging modalities has not been known sufficiently due to the fact that 3D acquisition techniques have currently emerged as new imaging modalities. Especially, 3D TEE zoom acquisition mode may clearly display both LE itself and thrombus formation on the LE due to its higher spatial resolution. Indeed, 3D TEE may particularly offer the relationship to nearby structures of LE by using flexi-slice mode.

The cut-off value of LE for surgery indication has not been known due to the rarity of such masses and their even rarer complications. So, there has not been a consensus on the best management approach for patients with thromboembolic event caused by isolated LE [6]. Cropping analysis of 3D software may calculate the irregularly shaped LE without geometric assumption. Hereby, this analysis may offer a risk of thromboembolic event related to LE; further it may guide in choosing treatment approach of the patient with LE. In addition, 3D acquisition modalities evaluate mobility of the mass in 3D space [7]. Movement of LE in our patient was dependent with the aortic cusp motion, and LE protruded into the ascending aorta over a cardiac cycle. Thus, the probability of embolic events may be lower due to relatively less mobile mass. Gowda *et al.* [8] showed that tumor mobility was an independent predictor of nonfatal embolization in patients with cardiac fibroelastoma.

Both 3D- TTE and especially 3D TEE may prove useful information about the risk of LE complications such as stroke, coronary artery embolism by quantifying the more accurate size of the mass, clearly showing LE itself and its adjacent structures and offering the mass mobility in 3D space. Hereby, 3D echocardiographic imaging modalities may lead to better estimation of the embolism risk in LE patients, subsequently give us the opportunity to plan ahead.

SUPPLEMENTARY MATERIAL

Supplementary material is available at the Journal of Surgical Case Reports online.

CONFLICT OF INTEREST STATEMENT

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article.

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