Which is first? Whether Takotsubo cardiomyopathy was complicated with acute stroke or acute stroke caused Takotsubo cardiomyopathy? A case report

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Introduction

Takotsubo cardiomyopathy (TCMP) is characterized by transient akinesis of the mid and apical segments of left ventricular walls in the absence of significant coronary artery disease (1). Other conditions include: chest pain, ischemic ECG abnormalities, and a mild increase of cardiac enzymes (2). TCMP may develop due to the acute stroke. In addition, patients with TCMP may have left ventricular apical thrombus that may lead to the acute ischemic stroke (3-5). In this case, we detected TCMP in patient with acute ischemic stroke and complete aphasia. Interesting point of our case is that we are not sure which the first is.

Case Report

A fifty year old woman with aphasia admitted to the emergency service. Relatives of patient said that her symptoms appeared after long hours of crying because of her brother death. Her vital signs were normal and there were no abnormalities in terms of regular biochemical analysis. Magnetic resonance imaging (MRI) demonstrated signal abnormalities in cortical and subcortical regions (Fig. 1A). Diffusion MRI showed impaired diffusion in the same regions with 3 x 9 cm in dimension (Fig. 1B). Patient was hospitalized with diagnosis of complete aphasia that did not recover. Carotid and vertebral arteries were reported normal by Doppler ultrasonography. Cardiology was consulted because of deep symmetric T wave inversion in anterior leads on ECG (Fig. 2). Echocardiography revealed left ventricular apical akinesia without any thrombus image (Video 1). Left ventricular ejection fraction was 40%. Cardiac biomarkers were above the upper reference limit. After discussing her primary physician, coronary angiography was planned. Coronary angiography demonstrated normal coronary arteries (Fig. 3A, B) and apical ballooning (Fig. 3C, D). Taking into account her clinical presentation and laboratory characteristics, diagnosis of Takotsubo cardiomyopathy was done. Clopidogrel, heparin and perindopril treatments were given during the hospitalization. Repeated echocardiography after two weeks showed improved left ventricular function and without apical akinesia.

Discussion

Takotsubo cardiomyopathy accounts for about 1-2% of all patients presenting with symptoms suggesting acute coronary syndrome and occurs predominantly in elderly women. Several mechanisms have been proposed, including multi vessel epicardial spasm, myocardial dysfunction mediated through catecholamine induced damage, microvascular coronary spasm or dysfunction and neurologically mediated myocardial stunning (6, 7).

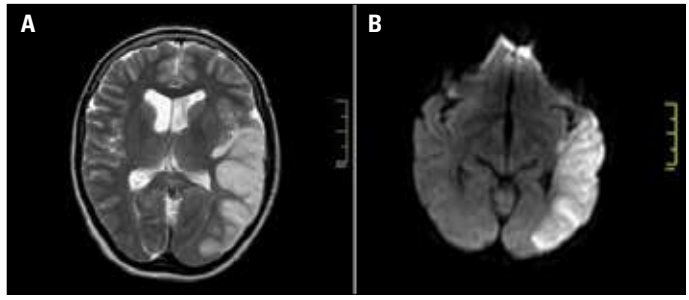

Figure 1. A, B. Magnetic resonance imaging (MRI) demonstrated signal abnormalities in left cortical and subcortical regions (panel A). Diffusion MRI showed impaired diffusion in the same regions with 3x9 cm in dimension (panel B)

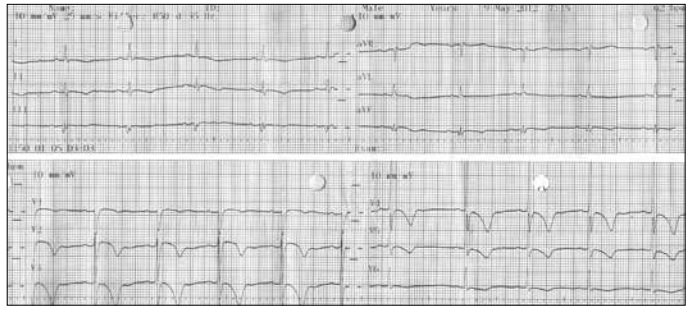

Figure 2. T wave inversion in anterior leads on ECG

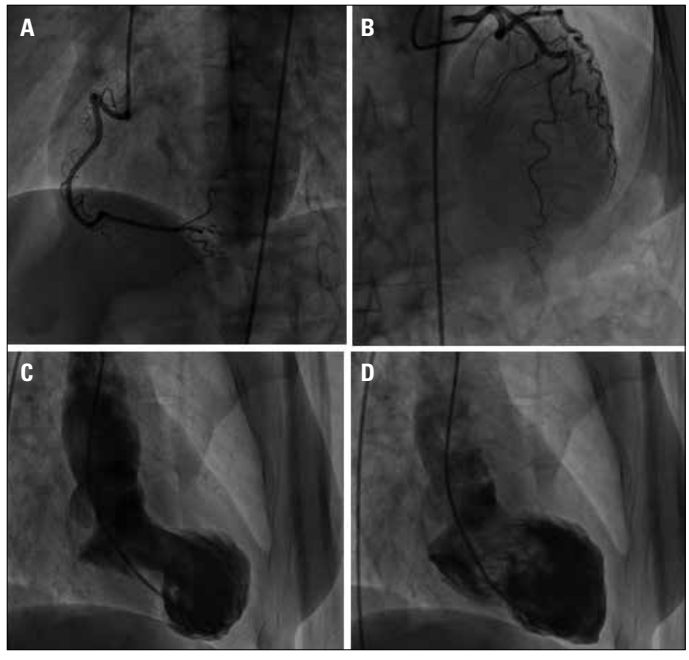

Figure 3. A-D. Coronary angiography showing normal coronary arteries (A, B), and ventriculography in systole (C) and diastole (D) showing apical ballooning

It is known that TCMP develops after hemorrhagic stroke. Also, Yoshimura et al. (3) investigated 569 patients with acute stroke and they found TCMP in 7 patients. All patients were female and 6 of them were more than 75 years old. Even it is rare, patients with TCMP may have left ventricular apical thrombus leading to the acute cerebral event (4,5). De Gregorio et al. (8) reported 15 TCMP patients with apical thrombus.

Acute stroke developed just only three patients. In our case, we diagnosed TCMP within 24 hours after acute stroke. Therefore, it is a dilemma that which caused to another? Since patient was relatively young and her symptoms started after a huge emotional stress, we suppose that TCMP developed first and stroke followed it.

Conclusion

We may suggest that when patients are presented with acute stroke especially after an emotional stress and they have low risk of atherosclerotic vascular disease, TCMP should be considered.

Video 1. Transthoracic apical four-chamber view showing the left ventricular apical akinesia

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Complex atrial septal defect referred for percutaneous closure-do we need three-dimensional echocardiography and magnetic resonance imaging?

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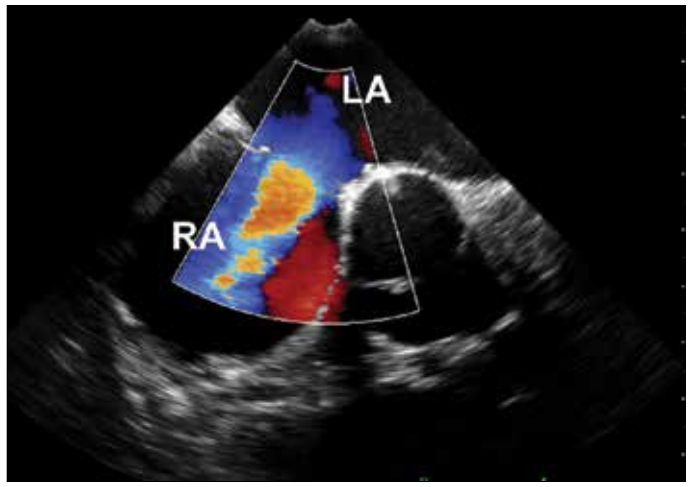

Figure 1. Two-dimensional transesophageal echocardiography-secundum type atrial septal defect with left-to-right shunt. The ASD was measured as 16x18 mm, with the aortic rim of 5 mm and the posterior lateral rim of 8 mm
LA - left atrium; RA - right atrium

Introduction

A complex atrial septal defect (ASD) is defined as a large ASD with a deficient margin or a multi-fenestrated/aneurismal septum (1). The possibility of percutaneous closure is determined by size, localization and tissue rims of an ASD (2-4).

First-line diagnostic method is echocardiography. According to current guidelines cardiac magnetic resonance (CMR) can be an alternative and complementary method to echocardiography in certain situations (2). CMR allows the choice of free-form cut surfaces, unavailable in other techniques (5).

We present a case of patient in whom important additional data were gained based on magnetic resonance.

Case Report

A 54-year-old female patient was diagnosed with secundum type ASD by transthoracic echocardiography (TTE) that revealed interatrial left-to-right shunt with dilated right ventricle. In two-dimensional transesophageal echocardiography (TEE) the ASD was measured as 16 x 18 mm (Fig. 1). However, three-dimensional TEE suggested the ASD may be fenestrated (Fig. 2).

CMR was conducted to verify previous results and to exclude other potential problems. This technique using steady-state free procession and phase contrast sequence revealed fenestrated ASD. The size of first oval defect was 14 x 22 mm, whereas the diameter of adjoining second round defect was 8.0 mm (Fig. 2).

The procedure of occlusion of ASD was conducted with TEE guidance and fluoroscopy. Amplatzer Cribriformis device (40 mm) was implanted in typical manner.

Routine follow-up TEE demonstrated a good result without complications and persistent shunts.

Discussion

We describe an example of fenestrated ASD with discrepancies between standard two-dimensional echocardiography and three-dimensional echocardiography combined with CMR.