

Double Embolism: A Very Rare Presentation of Concurrent Pulmonary Embolism and Embolic Stroke without Arteriovenous Shunt

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Case Report

Abstract

Embolic material forms in many parts of the body and can affect anywhere in the body. Pulmonary embolism and embolic stroke are the most common presentations of embolic disorders in the body. Embolic events have different causes, and the heart is one of the most important places where emboli originate. One of the uncommon causes of embolic events is non-bacterial thrombotic endocarditis (NBTE), which can occur in patients with advanced cancer. NBTE can lead to embolism. Embolisation may occur in some organs including the central nervous system, kidneys, spleen, limb extremities, and coronary arteries. The authors aim to describe a rare case with concurrent pulmonary embolism (PE) and embolic stroke caused by non-bacterial thrombotic endocarditis (NBTE) in a woman with breast cancer.

Keywords: Double embolism, Embolic stroke, Pulmonary embolism, Arteriovenous shunt, Concurr

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Introduction

The term “embolic” was introduced by Virchow in 1854 when he reported a patient with stroke due to a clot originating from the heart¹. Most embolic lesions are divided into thrombotic and non-thrombotic material that are formed in the vein, artery, cardiac chamber, and heart valve². The prevalence of PE is estimated at 60 to 70 per 100,000 of the general population³. PE is a most important clinical disorder that, in spite of advances in treatment, is associated with a high mortality rate⁴. The concurrent occurrence of pulmonary embolism and systemic embolism is very rare⁵. Some reported presentations of concurrent these two embolic disorders are patients with atriovenous shunts including patent foramen

ovale (PFO), atrial septal defect (ASD), or pulmonary arteriovenous fistula (PAVF)⁶. In this paper, the authors report a rare case of two embolic lesions without atriovenous shunt caused by non-bacterial thrombotic endocarditis in a woman with breast cancer.

Case report

A 46-year-old woman was referred to our center with a complaint of left limb weakness. The patient had a history of breast cancer two years ago and underwent surgery and chemotherapy. Due to recurrence of cancer and liver metastatic lesions, she was treated with a course of chemotherapy two weeks before referral. She has been taking tamoxifen for two years. In her examination, the conjunctiva

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was pale and the muscle strength of the left lower and upper limbs was 0.5 with mild left foot edema. On admission, her vital signs were normal. Her blood tests included hemoglobin: 9.2 g/dl, platelets: 70,000, WBC: 12,000, ESR: 35, CRP: 5, serum iron: 15, ferritin: 479. The other tests including BUN, Cr, LFT, and ECG were normal. Rheumatologic and coagulopathy assessments were normal. Carotid Doppler ultrasound was normal. Because of lower limb edema, the lower limb Doppler ultrasound was performed and the day after admission, acute DVT in popliteal veins and chronic DVT in left femoral veins were reported. Although the computed tomography scan was normal, brain magnetic resonance imaging (MRI) confirmed an acute ischemic infarct in the right basal ganglia and temporoparietal (Figure 1). Thus, the authors used transthoracic and transesophageal echocardiography in the evaluation of a cardiac source of embolism. Transthoracic echocardiography showed a large size, irregular mobile shaggy mass on the tricuspid valve

and mitral valve associated with moderate valvular regurgitation that were confirmed by transesophageal echocardiography (Figures 2 and 3). Echo findings were completely suggestive of neither nonbacterial nor bacterial endocarditis. Also, according to patient dyspnea, the pulmonary CT angiography was requested. Pulmonary CT angiography showed bilateral acute pulmonary embolism. She was treated with enoxaparin 1 mg/kg BD. After consulting with an infectious disease specialist, rheumatologist, and hematologist, the patient was treated with gentamicin and ciprofloxacin. Cardiac lesions were followed up and gradually became smaller. Antibiotics were discontinued after four weeks and enoxaparin continued for six months. After four weeks, the cardiac lesions were resolved and according to the underlying disease of the patient, Xarelto was prescribed. After six months of medical therapy and rehabilitation, the muscle strength of the lower and upper limbs was 3.5.

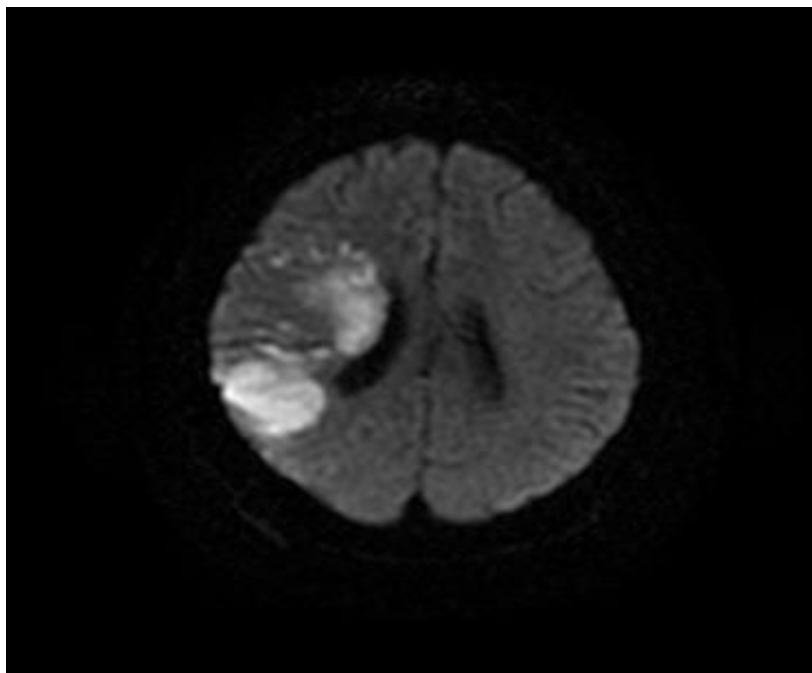
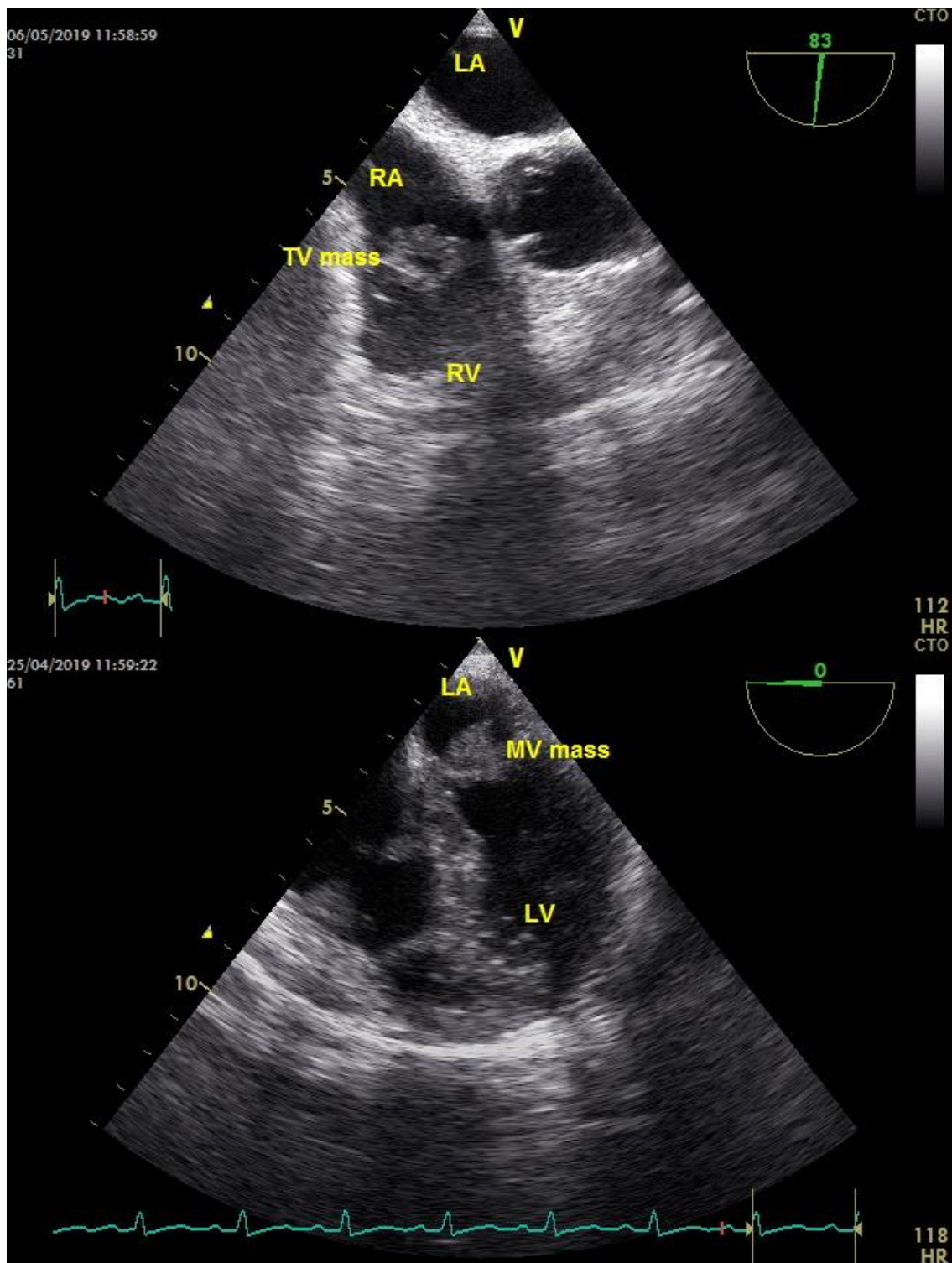


Figure 1. Brain MRI revealed acute infarct in basal ganglia and temporoparietal lobe without enhancement on the right hemisphere



Figures 2,3. Transthoracic echocardiography showed: large size irregular mobile shaggy mass on TV and MV that confirmed by esophageal echocardiography later

Discussion

Pulmonary embolism is the most common embolic disorder affecting many patients who are at high risk for this disease ⁴. Also, the incidence of cardioembolic stroke has been increasing in developed countries in recent decades ⁷. Pulmonary embolism often occurs due to deep venous thrombosis, as was the case with our patient. However, cardioembolic stroke may occur when some underlying disorders such as atrial fibrillation, systolic heart failure, recent myocardial infarction, patent foramen ovale, prosthetic heart valve, and infective endocarditis are present ⁸. Although cardioembolic stroke originates from cardiac disorders, it sometimes occurs due to DVT when ASD and PFO are present ⁶. Our case had no common causes of cardioembolic stroke, and this stroke occurred due to thrombosis caused by breast cancer because cancer is a risk factor for thrombotic lesions. The origin of these two concurrent embolic disorders is thrombotic lesions that involved the two cardiac valves including the mitral and tricuspid valves. The pulmonary embolism in this case may have originated from DVT or a thrombotic lesion on the tricuspid valve, but according to the absence of ASD and PFO, the embolic stroke may have occurred due to a thrombotic lesion on the mitral valve. Based on the morphology of the thrombotic lesion in echocardiography, resolving the lesion by anticoagulant therapy, negative blood culture, and the patient's clinical condition that did not worsen during this lesion, the most probable diagnosis of our case is non-bacterial thrombotic endocarditis (NBTE). NBTE is an uncommon cause of thrombotic events and although the exact prevalence of NBTE remains unknown, it occurs in approximately 4% of all patients with advanced cancer ⁹. Embolisation may occur in some organs including the central nervous system, kidneys, spleen, limb extremities, and coronary arteries ¹⁰. In our case, the embolisation occurred in the central nervous system and led to cerebral infarction. The pathogenesis of NBTE is associated with the hypercoagulable state of

cancer ¹¹. Aryana et al. reported a similar case of NBTE which led to transient ischemic neurologic deficits and recurrent systemic and pulmonary emboli in a 43-year-old woman with ovarian cancer ¹². Glass and colleagues also reported a case of cerebrovascular events due to cervical carcinoma in a 42-year-old woman who had no risk factor for stroke and in her workup, NBTE was identified as the cause ¹³. Ferreira et al. reported a case of pulmonary embolism due to NBTE attributed to lung cancer, while in our case, the two embolic lesions occurred due to breast cancer ¹⁰. The diagnosis of NBTE is difficult and this diagnosis should be kept in mind when the underlying disease, new heart murmur, and systemic embolisation are present, although echocardiography is required for diagnosis ¹⁴. Systematic anticoagulation is a cornerstone of treatment for NBTE and also the management of cancer should be considered in this situation. Our case was subjected to treatment with an anticoagulant and the lesions were resolved after four months, and follow-up with echocardiography was suggested.

Conclusion

NBTE as one of the uncommon causes of embolic events can cause concomitant embolic events especially in cancer patients and it is recommended that NBTE be considered as the culprit in simultaneous embolic events. This case report was written with the patient's informed consent.

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