

## Development of cerebral infarction after stripping of vena saphena magna

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### Abstract

Cerebrovascular disease is the most frequent cause of neurological diseases. Embolic infarction is one of the most common causes of stroke. In the majority of patients with cerebral embolism, it is shown that emboli mostly originate from the heart via arterial circulation. Embolism rarely occurs as a paradoxical embolism through atrial / ventricular septal defect (ASD/VSD) or patent foramen ovale (PFO). In our clinical case, cerebral infarction is caused by ASD after vena saphena magna (VSM) stripping. Thirty- four- year- old female patient was admitted with motor and sensory loss at left lower extremity below the knee after stripping of VSM. Detailed neurological examination was done. She had left foot motor deficit, anesthesia of left lower extremity below the knee, impairment of motor strength (0/5 dorsiflexion and plantar flexion) of the left foot. After radiological investigation, diffusion weighted magnetic resonance imaging (MRI) revealed several, millimetric, nonspecific, nodular signal changes in some parts of bilateral periventricular, subcortical white matter of the brain that showing no diffusion limitation. In systematic examination, atrial septal defect was detected by echocardiography. Patient was treated with anticoagulant therapy. This case highlights detailed cardiological examination should be done in patients with cerebral infarction

**Key words:** Atrial septal defect, Cerebral Ischemia, Lower extremity motor, Sensory loss

### Introduction

Cerebrovascular disease is a leading cause of neurological events, in terms of importance and frequency in adulthood. Embolic infarction is one of the most common causes of stroke. The most common sites of origin of cerebral emboli are cardiac thrombus. Embolism may break from occluded or severely stenotic carotid artery, distal end of the thrombus of vertebral artery or an ulcerated atheromatous plaque extending into the lumen of the carotid sinus. 5-10% of cerebral ischemia is caused by paradoxical embolism. One of the reasons that may be able to cause paradoxical embolism is atrial septal defect (2). ASD is characterized by a hole between atriums and causes abnormal blood flow. Thus, a portion of blood abnormally flows to the right heart. This situation may cause damage to blood vessels in the lungs and the heart muscle over the years due to increased blood flow to the lung. The patients which has ASD usually lives with asymptomatic for many years. Definitive diagnosis is based on echo cardiograph. ASD is a rare cause of embolism (3, 4). The aim of this study was to report a case with acute cerebral ischemia caused by ASD.

### Case

34 year old female patient was admitted to department of Cardiovascular Surgery Clinic at Gazi University Medical School with left lower extremity motor and sensory loss below the knee. In the clinical history, it is learned that she underwent vena saphena magna stripping surgery in another clinical centre and she applied on the third postoperative day with motor and sensory loss. There was no positive sign in her family history. In the neurological examination, the patient was awake, cooperated, oriented and there were no signs of meningeal irritation or neck stiffness. Motor deficit is found in the left foot; the grade of dorsiflexion and plantar flexion was 0/5. Left lower extremity below the knee was anesthetic, routine complete blood count, biochemical tests were normal. The patient was consulted to neurology, neurosurgery, orthopedics, physical therapy and rehabilitation departments. Electromyography (EMG) was performed and reported as normal. The symptoms are thought to be related with the central nervous system pathology. Electroencephalography (EEG), MRI and cranial computerised tomography (CT) was performed.

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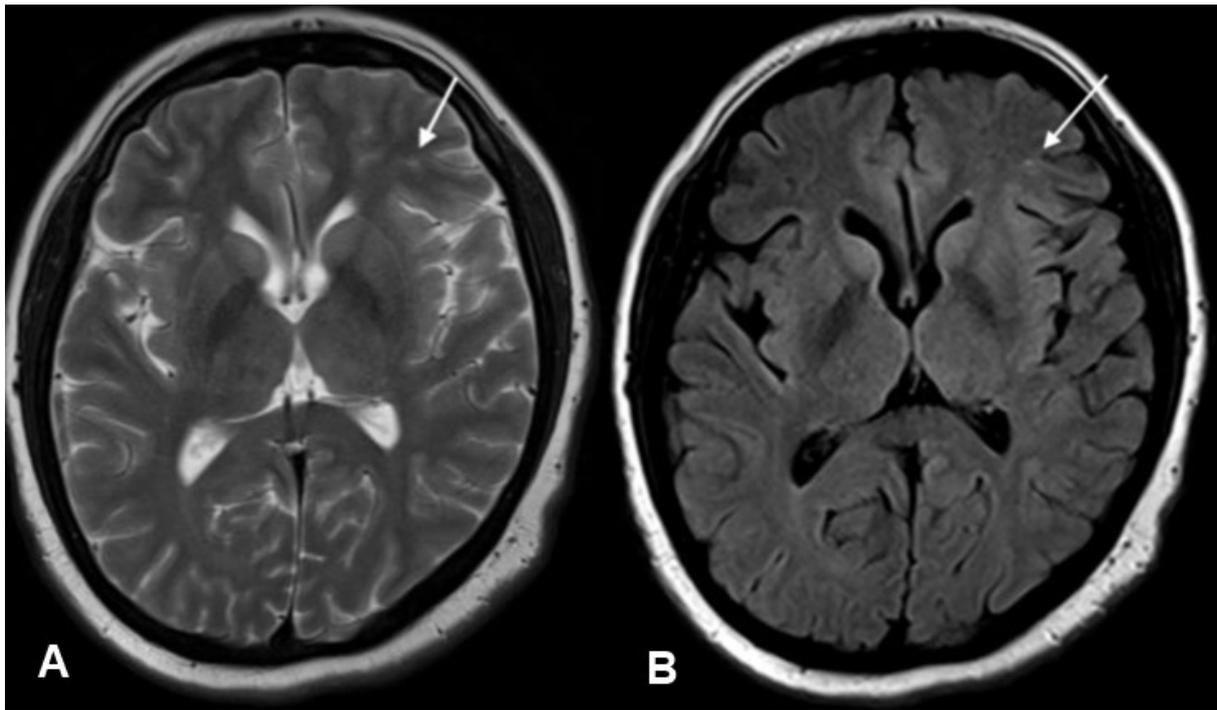


Figure 1. Axial T2-weighted (A) and FLAIR (B) images show nonspecific hyper intense signal changes (arrows).

EEG and cranial CT were reported as normal. Bilateral carotid and vertebral artery Doppler ultrasonography was performed and reported as normal. On the diffusion-weighted cranial MRI a few millimetric nonspecific nodular signal changes exhibiting no diffusion restriction was observed in bilateral periventricular, subcortical white matter areas of the brain (figure 1). Echocardiography was planned. Left ventricular cavity size was normal, measurement of left ventricle walls thickness was normal, and analysis of systolic and diastolic left ventricular wall motion was normal. Shunt flow was observed through inter atrial septum. QP / QS ratio was 1. The patient's anticoagulant therapy was planned physical therapy program was started and the patient was discharged from hospital.

### Discussion

Embolic stroke constitutes 15-20% of all strokes. In recent years because of widespread availability of trans-esophageal echocardiography (TEE) the frequency of the cardiac sourced embolism has increased. Transthoracic echo-cardiography (TTE) has been shown to have sensitivity for indicating the left ventricle and mitral valve disease. If the patient is old and the cardio-embolic reason is obvious, TTE is enough (3). TEE wasn't performed, as other tests that may be related with the ethology were normal and ASD was enough to explain this case. Especially in younger patients ASD should be considered as the cause of cardio-embolic stroke.

In a study which included 152 young stroke patients, %1 of the patients with ASD had been reported by the Segmen et al (3). In recent years, ASD is represented as a major cause of retinal and cerebral embolism (5). Ash et al reported three cases with ASD and ASD was thought to be the possible cause of cerebral embolism. They explained the importance of TEE and TTE in unexplained cerebral ischemia cases especially in the young (5). Devuyst et al reported the importance of the aortic arch atheroma, atrial septal aneurysm (ASA) in cardiac stroke (6).

Sayin et al reported a case with atrial septal defect, retinal artery occlusion and cerebral infarct and explained the importance of detailed cardiological examination in cases detected transient ischemic attack or cerebral infarction (7). The findings in our patient's case are likely explained by ASD.

### Conclusion

ASD is the most common congenital heart defect encountered in adults. Small ASDs are usually asymptomatic and compatible with a normal life. We believe that the potential cause of cerebral ischemia in our patient is ASD. We would like to emphasize once more the importance of detailed cardiological examination in the cases detected cerebral infarction

**Conflict of Interest:** The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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