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Case Report

# Diffuse cerebral embolism as the first manifestation of the right atrial myxoma

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ABSTRACT

*Introduction:* Neurological complications in patients with diagnosed atrial myxoma occur in approximately 30% of cases.

*Aim:* The aim of this paper is to present the case of a female patient with right atrial myxoma and demonstrate neurological complications.

*Case study:* This paper presents the case of a 51-year-old female patient who was admitted to the hospital due to dizziness, nausea, vomiting and gait disorders lasting for two days. Head computed tomography (CT) showed vascular changes in the cerebellum and magnetic resonance imaging (MRI) of the brain revealed numerous synchronous, recent vascular diffuse foci in the left occipital lobe and left cerebellar hemisphere. Transthoracic echocardiography examination (TTE) detected the myxoma in the right atrium with the suspicion of atrial septal defect secundum (ASD2). The patient underwent a successful surgery to remove the right atrial myxoma. The procedure also revealed ASD2.

*Results and discussion:* Myxoma is one of the most common primary heart tumors and it accounts for about 50% of benign heart tumors; three out of four cases involve women. Most myxomas are localized in the left atrium and only approximately 18% are found in the right one. The symptoms of brain damage usually appear when the tumor is localized in the left atrium and rarely occur when the tumor involves the right atrium. In the presented case,

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during the procedure, the coexistence of ASD2, which may lead to crossed embolism, was confirmed.

*Conclusions:* The right atrial myxoma may manifest with neurological symptoms due to diffuse cerebral embolism.



## 1. Introduction

Neurological complications in patients with diagnosed atrial myxoma occur in approximately 30% of cases.[6] In this group, stroke is one of the most common complications caused by cerebral embolism due to myxoma. Symptoms of brain damage usually appear when tumors are localized in the left atrium, whereas they are very rare in the case of the right atrium tumors.[4]

## 2. Aim

The aim of this paper is to present the case of a female patient with right atrial myxoma and demonstrate neurological complications.

## 3. Case study

This paper presents the case of a 51-year-old female patient who was admitted to the Clinical Department of Neurology due to dizziness, nausea, vomiting and gait disorders lasting for two days. On admission, a neurological examination revealed: both directions horizontal nystagmus, abnormal motor tests results for each limb (dominant on the left side), positive Romberg's test, and a wide-based unsteady gait with lateral, left side deviation. Head computed tomography (CT) showed vascular changes in the cerebellum and magnetic resonance imaging (MRI) of the brain revealed numerous synchronous, recent vascular diffuse foci in the left occipital lobe and left cerebellar hemisphere. Less numerous ischemic foci were also visible in the posterior medulla oblongata, in the right cerebellar hemisphere and in the cerebellar vermis in the right occipital and parietal lobes (Fig. 1). Doppler ultrasound exam of carotid arteries did not reveal stenosis and the cerebral blood flow was preserved. Transthoracic Echocardiography examination (TTE) detected the presence of a movable structure in the right atrium, characterized by an oval shape with uneven margins and nonhomogenous echogenicity, with interatrial septum continuity features. This lesion involved almost the entire volume of the right atrium and during a diastole its small part protruded through the tricuspid valve to the right ventricle (Fig. 2). The image of the preserved interatrial septum continuity in the TTE was inconclusive, leading to the suspicion of a defect in its mid-inferior part. Thus, an initial diagnosis of the right atrial myxoma with the suspicion of atrial septal defect secundum (ASD2) was formulated. Because it was not possible to confirm ASD2 in transesophageal echocardiography (TEE), it was decided to verify the existence of the defect in a direct interatrial septum examination during cardiac surgical treatment. The performed coronarography did not reveal any essential changes in coronary arteries. In the Department of Cardiac Surgery the patient underwent a successful surgery to remove the right atrial myxoma. The procedure also revealed ASD2 (Figs. 3 and 4). The diagnosis of ASD2, during the cardiac surgical procedure, confirmed crossed embolism resulting in

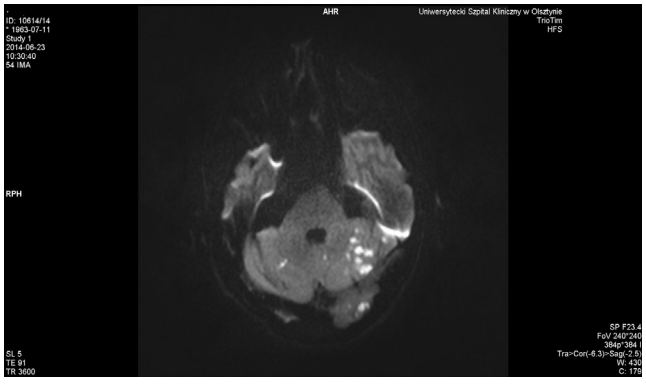


**Fig. 1 – Brain MRI – diffuse minor embolic changes in the left occipital lobe and left cerebellar hemisphere.**

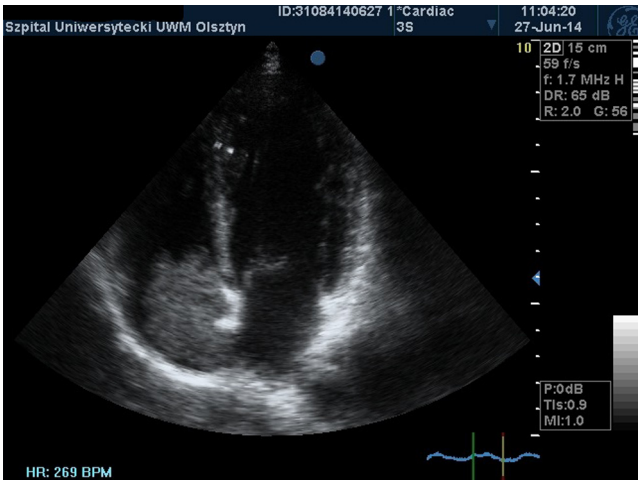


**Fig. 2 – TTE examination result: four chamber apical view with a visible oval structure in the right atrium, of an increased echogenicity, protruding to the right ventricle (the arrow) through the tricuspid valve, and in the mid-inferior part of interatrial septum a defect is suspected (the arrow).**

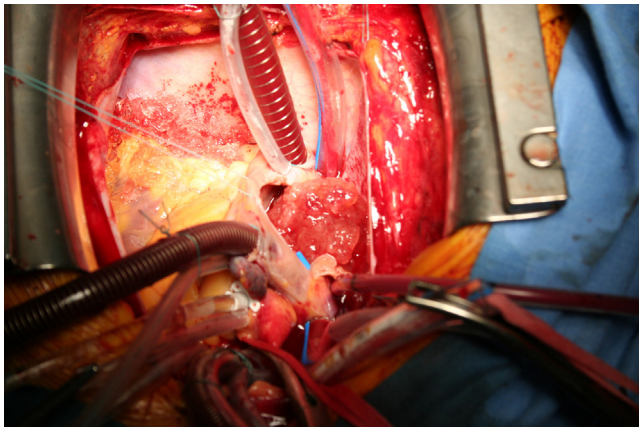

**Fig. 3 – Myxoma revealed after cutting the wall of the right atrium (the arrows). Image taken during the surgery.**

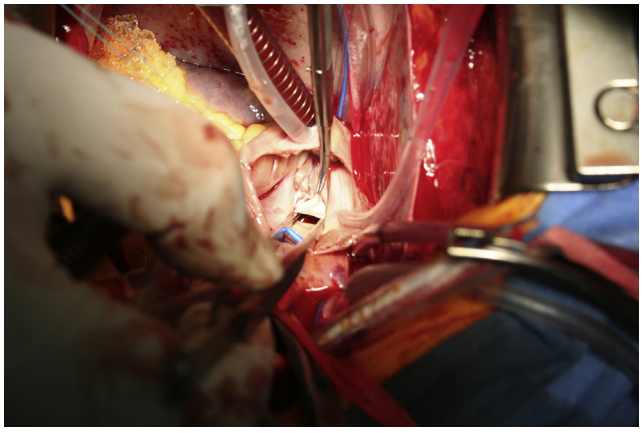

**Fig. 4 – Atrial septal defect (the arrow). Image taken during the surgery.**

diffuse cerebral lesions of the right atrial myxoma origin. The control echocardiographic examination performed after six months showed no recurrence of myxoma.

## 4. Results and discussion

Myxoma is one of the most common primary heart tumors and it accounts for about 50% of benign heart tumors; three out of four cases involve women. Most myxomas, i.e., approx. 74%, are localized in the left atrium and only approx. 18% are found in the right one.[1,3] Ventricular localization is extremely rare. In about 90% of cases myxoma is located in the fossa ovale of the interatrial septum; it rarely infiltrates the right atrium wall. Differential diagnosis should include thrombus, which should be more homogenic and hyperechogenic in the echocardiographic image, while myxoma presents nonhomogenic zones of decreased echogenicity.[4,7] Histopathologically these tumors are usually benign. Due to their location, however, they can lead to life threatening complications, such as pulmonary or cerebral embolism. The frequency of vascular complications in myxoma patients can approach 30%.[6,8] In this group of patients the most common complication is stroke due to cerebral embolism caused by material from the myxoma. The symptoms of brain damage usually appear when the tumor is localized in the left atrium and rarely occur when the tumor involves the right atrium.[4] At the same time, myxoma diagnosis constitutes an indication calling for an urgent cardiac surgical procedure in order to reduce the risk of embolic complications or the blocking of the atrioventricular canal by tumor mass.[5] An open cardiac surgical treatment performed shortly after an occurrence of cerebral embolism can be connected to a higher risk of hemorrhagic stroke or cerebral edema. On the other hand, further disseminated embolic process may worsen the patient's general condition and complicate any surgical treatment in the future.[2] In the presented case, considering the good general condition of the patient, coronarography was performed as a semi-elective procedure and the patient was referred for surgical treatment; the transesophageal echocardiography was omitted due to a characteristic tumor image in the TTE and clinical examinations.[9] During the procedure, the coexistence of ASD type 2, which may lead to crossed embolism, was confirmed.

## 5. Conclusions

The right atrial myxoma may manifest with neurological symptoms due to diffuse cerebral embolism.

## Conflict of interest

None declared.

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