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Left ventricle cardiac myxoma as a cause of ischaemic stroke in young patient treated by mechanical thrombectomy

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Abstract

Cardiac myxoma is a rare cause of cardioembolic stroke, especially in young patients. Acute treatment includes intravenous thrombolysis or acute thrombectomy via mechanical recanalisation. We present a case of a young 21-year-old woman with no symptoms of dyspnoea who suddenly developed expressive aphasia and right-sided hemiparesis due to a thrombus in the left middle cerebral artery followed by the left anterior cerebral artery. She underwent acute mechanical thrombectomy with improvement of the neurological status. Bedside ultrasonography detected a suspected myxoma, which was further confirmed by a CT scan as a myxoma in the left cardiac ventricle. The patient underwent successful surgery. We stress on the importance of echocardiographic examination in young patients after ischaemic stroke and multidisciplinary team cooperation in the treatment management of such patients.

CASE REPORT

INTRODUCTION

Cardiac myxoma is a rare cause of cardioembolic stroke especially in young patients (Keeling, 2002). It is the most common benign primary cardiac tumour. Fortunately, its incidence is very low, about 1 in 1,000,000 (Shi-Min Yuan, 2015). It is mostly detected in the atrium and rarely occurs in the cardiac ventricle (Assaf *et al.* 2018). Acute stroke caused by embolism of the myxoma with a thrombus into the brain can be successfully treated by intravenous thrombolysis (Dong *et al.* 2019). If this treatment fails or cannot be administered due to a prolonged delay after the onset of the stroke (more than 4.5 hours), acute thrombectomy via mechanical recanalisation may be attempted (Chung *et al.* 2016).

We present our experience with the diagnosis and acute treatment of ischaemic stroke by mechanical thrombectomy in a young patient with atypical myxoma in the left ventricle.

CASE REPORT

A 21-year-old woman suffering from migraines, who had been using hormonal contraceptives, was admitted to the acute stroke programme due to weakening of her right limbs and sudden speech problems. Her last previous contact with any witness (her room-mate) was at 10:30 a.m., and she was only found at 5 p.m. that day. The neurological finding on admission was dominated

by a phatic disorder with a predominant expression component, moderate right-sided hemiparesis reaching a score of 11 on the NIHSS (National Institutes of Health Stroke Scale).

Minor hypodensities in basal ganglia and cortically were apparent in the baseline CT scan (Figure 1). Her ASPECTS score was 6–7. CT angiography (Figure 2) revealed occlusion of the left middle cerebral artery (MCA, section M1) and stenosis of the left anterior cerebral artery (ACA, section A1).

As the therapeutic window for intravenous thrombolysis had been exceeded (more than 4.5 hours after the onset of the stroke), this approach was not undertaken. Instead, mechanical recanalisation was used as the next treatment option. The patient was transported to the angiography room, where left-side MCA thrombectomy followed by left-side ACA was performed. The patient's circulatory parameters were stable during the procedure, only the patient was slightly restless. ASA 500 mg, heparin 2,500 units and verapamil 5 mg were administered periprocedurally.

A brain CT scan was performed on the second day of hospitalisation, showing ischaemia in the CA circulation. The extent of the finding remained unchanged compared to the baseline CT scan (Figure 3).

A bedside echocardiographic examination was performed, detecting an irregular hyperechogenic structure, 7 mm x 10 mm in size, close to the cardiac septum with fluttering fibres. A thrombus was suspected in the left ventricle. The cardiologist recommended the highest possible heparinisation, but in view of the extent of the ischaemic focus in the brain CT, LMWH therapy was initiated at a reduced dose of 0.4 ml every 12 hours in order to reduce the risk of haemorrhagic transformation of the ischaemic focus in the brain.

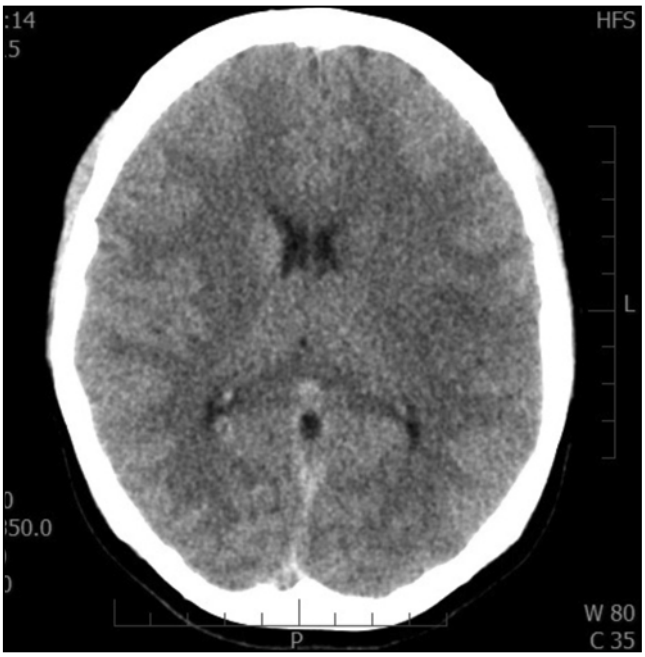

Fig. 1. Brain CT scan with small hypodensities in the left MCA circulation

The right-sided hemiparesis improved substantially into a mild-level motor deficit on the third day of hospitalisation, expressive aphasia and apraxia persisted. Numerous ventricular arrhythmias (couplets of ventricular extrasystoles) continued. Magnesium substitution was introduced.

The control cardiac echocardiography still detected a mobile object in the left ventricle, a tumour cause (myxoma) was suspected. The patient was transferred to the coronary unit where cardiac CT was performed, revealing an expansive tumour in the left ventricle on a thin stalk attached to the septum, probably a myxoma, 16 x 21 x 23 mm in size (Figure 4).

Cardiac surgery was indicated, the myxoma was extirpated and the small defect in the atrial septum was occluded. Postoperative echocardiographic follow-up showed a favourable condition after the extirpation of the tumour in the left ventricle without any apparent residue. Histology confirmed the diagnosis of left ventricular myxoma. The patient was discharged into outpatient care a month after her admission. Currently, she uses only 100 mg of ASA. Moderate expressive aphasia with slight right-sided hemiparesis persist in the neurological finding. The patient is self-sufficient, is able to walk independently, and is undergoing active rehabilitation and speech therapy.

DISCUSSION

Acute ischaemic stroke with cardiac myxoma is rare in young individuals at the age of about 20 (Yuan and Humuruola, 2015). The main characteristics of this settings include young adults, female predominance, single cerebral vessel (mostly the middle cerebral artery), multiple territory involvements and solitary left atrial myxoma. Our patient was young female; the most affected cerebral vessel was the middle cerebral artery.

Clinical symptoms of cardiac myxoma usually include slowly progressive dyspnoea caused by obstruction of left atrial or mitral flow. No dyspnoea-related problems were present in our patient. In fact, the first manifestation of this tumour was acute ischaemic stroke. This is one of the most feared complications of myxoma along with systemic embolism. Another atypical aspect in our patient was the location of the tumour in the left ventricle. Myxomas are typically positioned in the left atrium, where this tumour usually grows from the atrial septum with a strong stem.

The treatment of choice in acute ischaemic stroke is either intravenous thrombolysis within 4.5 hours of the stroke or mechanical recanalisation via thrombectomy if the delay after the onset is longer. Such procedures – intravenous thrombolysis (Nagy et at, 2009, Vidale *et al.* 2017) or mechanical thrombectomy (Baek *et al.* 2014, Tadi *et al.* 2019) – can also be used after ischaemic stroke caused by embolism in a cardiac myxoma patient.

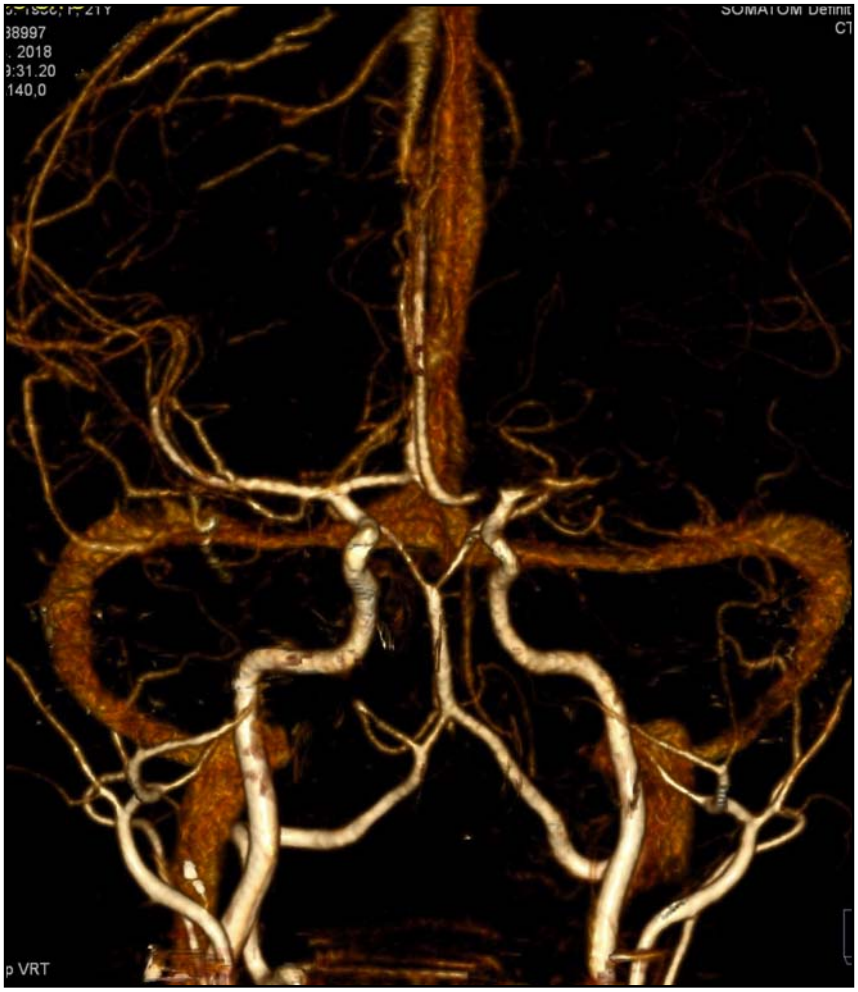

Fig. 2. CT angiography revealed occlusion of the left MCA

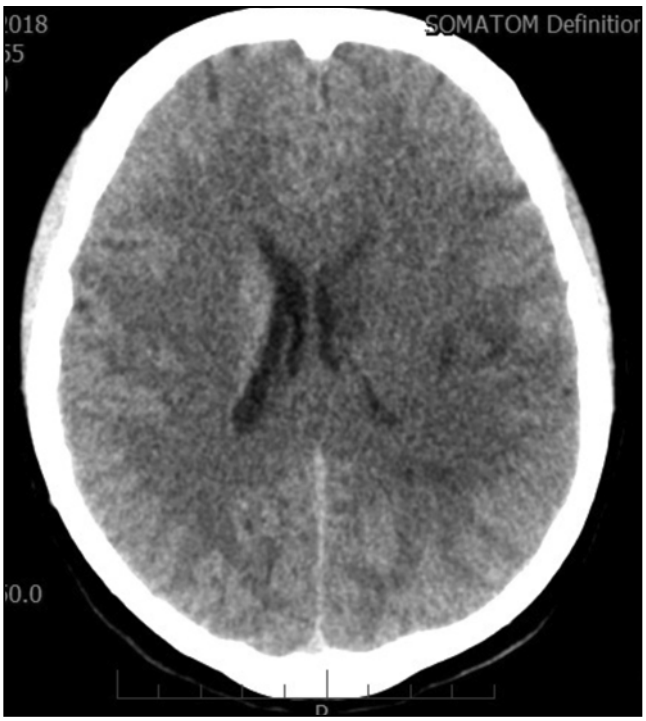

Fig. 3. Control brain CT scan with stationary small hypodensities in the left MCA circulation

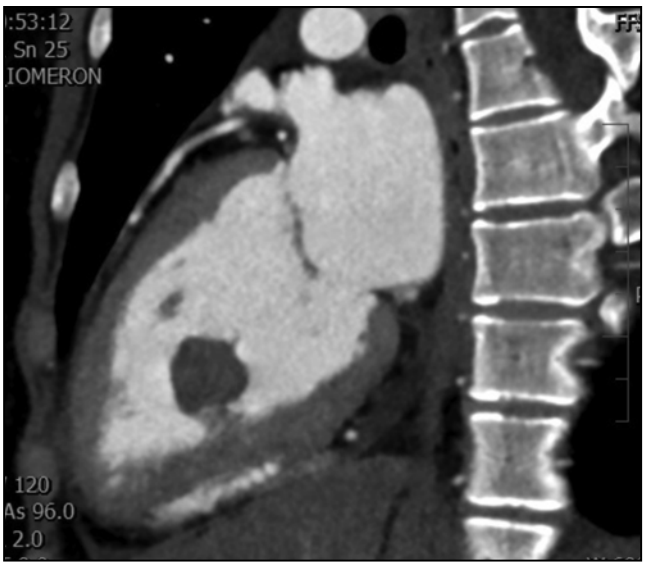

Fig. 4. Cardiac CT scan – an expansive tumour in the left

Successful intra-arterial administration of tirofiban in a 52-year-old Chinese male suffering from ischaemic stroke caused by left atrial myxoma has recently been reported (Yuan *et al.* 2020). Systemic administration of a thrombolytic agent (recombinant recombinant rt-PA – alteplase) was impossible in our patient as the recommended time window had been exceeded. The mechanical thrombectomy was successful and the clinical condition of the patient improved.

Accurate diagnosis of the cause is also an important part of acute ischaemic stroke management. We recommend performing early bedside echocardiographic examination. If a thrombus in the auricle or myxoma is suspected, a cardiac CT or MRI scan should also be performed in order to confirm the final diagnosis. An early surgical resection of cardiac myxoma is recommended in patients with not large territory cerebral infarct, whereas a delayed surgery was associated with an increased risk of complication (Yuan and Humuruola, 2015).

CONCLUSION

This case report confirms the importance of careful echocardiographic examination in young patients after ischaemic stroke and documents multidisciplinary cooperation in the treatment of patients after cardioembolic stroke caused by cardiac myxoma.

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