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Large Basilar Trunk Aneurysm Discovered Incidentally in a Patient with Ischaemic Stroke: Case Report

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Abstract

Summary: Many anomalies can be observed in the basilar trunk, such as aneurysms. Basilar trunk aneurysms are rare with a low reported prevalence. In this study, we describe a case of ischaemic stroke revealed by a basilar trunk aneurysm associated with venous thromboembolic disease. The patient was 60 years old and had no specific pathological history. She was seen for a sudden onset of right hemiplegia associated with dysarthria that had been present for 12 hours. The physical examination revealed a pyramidal syndrome and an altered general condition. An emergency cerebral computed tomography (CT) scan showed evidence of a cerebrovascular accident associated with a saccular aneurysm. We adopted the diagnosis of a deep left sylvian stroke associated with a superficial right sylvian stroke in the setting of an incidentally discovered basilar trunk aneurysm. On the 9ème day of hospitalisation, the patient experienced sudden onset of respiratory distress in conjunction with a warm, painful swelling of the right leg. TTE revealed signs of pulmonary embolism, with thrombi in the inferior vena cava and right atrium. Pulmonary embolism was highly probable, with a modified Geneva score of 15. We adopted the diagnosis of DVA complicated by pulmonary embolism in the setting of a basilar trunk aneurysm. The patient was transferred to the cardiology department, where she received oxygen therapy and thrombolysis with streptokinase. The immediate outcome 6 hours later was the sudden death of the patient due to the onset of cardiogenic shock.

Keywords

Aneurysm, Ischemic Stroke, Thrombolysis

1. Introduction

The vertebro-basilar system is a structure that supplies arterial blood to the spinal cord, the brain stem, the cerebellum, the lower surface of the temporal lobe and the lateral and medial surfaces of the occipital lobe of the brain [1]. It is formed by the two vertebral arteries and the basilar trunk. Numerous anomalies can be observed in the basilar trunk, such as aneurysms. Basilar trunk aneurysms are rare, difficult to treat and present a high risk of mortality in the event of rupture or thrombosis [2]. Usually discovered at autopsy, a prevalence of between 0.7% and 5.8% has been reported, but this is underestimated as they are generally discovered by chance [3]. In this study, we report a case of ischaemic stroke revealed by a basilar trunk aneurysm associated with venous thromboembolic disease.

2. Observation

The patient was Mrs O.S., 60 years old, a housewife, sedentary and irregularly hypertensive, who had been monitored for approximately 5 months without hypertensive treatment. She was admitted to the neurology department with a sudden onset of right hemiplegia associated with dysarthria that had been present for 12 hours. Physical examination revealed blood pressure of 136/85mmHg, moderate obesity, poor general condition, Broca's aphasia and right hemiplegia. The rest of the nervous system examination was unremarkable, as was the cardiopulmonary examination. The emergency cerebral CT scan was in favour of a cerebral accident in the superficial territory of the left superficial sylvian vein (**Figure 1**). The CT scan also revealed an unruptured bilobed saccular aneurysm of the basilar trunk. In the search for an aetiology for the AVCI, we performed encephalic angio-MRI, which revealed a persistent saccular aneurysm in the basilar trunk measuring 25 × 28 × 33 cm, associated with atheromatous calcifications of the carotid bifurcations (**Figure 2**). The supra-aortic trunks were normal. The MRI also revealed ischaemic lesions of different ages, the most recent of which was in the right superficial sylvian territory. Transthoracic echocardiography (TTE) and ECG were normal. Blood glucose and lipid levels were normal. The rest of the biological work-up showed no particularities apart from a slight hypocalcaemia of 2.10 mmol/l. We accepted the diagnosis of a deep left sylvian AVL associated with a superficial right sylvian AVL in the setting of an incidentally discovered basilar trunk aneurysm. Mrs O.S. received nursing care, enoxaparin at a preventive dose, tramadol 100 mg every 12 hours, and fluoxetine 20 mg in the evening. On the 9ème day of hospitalisation, the patient experienced sudden onset of respiratory distress, accompanied by a hot and painful swelling of the right leg. On examination, a respiratory distress syndrome was noted, as well as

a Homans' sign on the right and a reduction in the shaking of the calves of the right leg. Oxygen saturation was 85% on room air and blood pressure 95/52 mmHg. TTE revealed signs of pulmonary embolism, with thrombi in the inferior vena cava and right atrium (Figure 3). Doppler ultrasound of the veins and arteries of the right leg could not be performed, nor could a thoracic angioscan. Biological D-dimer values returned to 9.97. Pulmonary embolism was highly

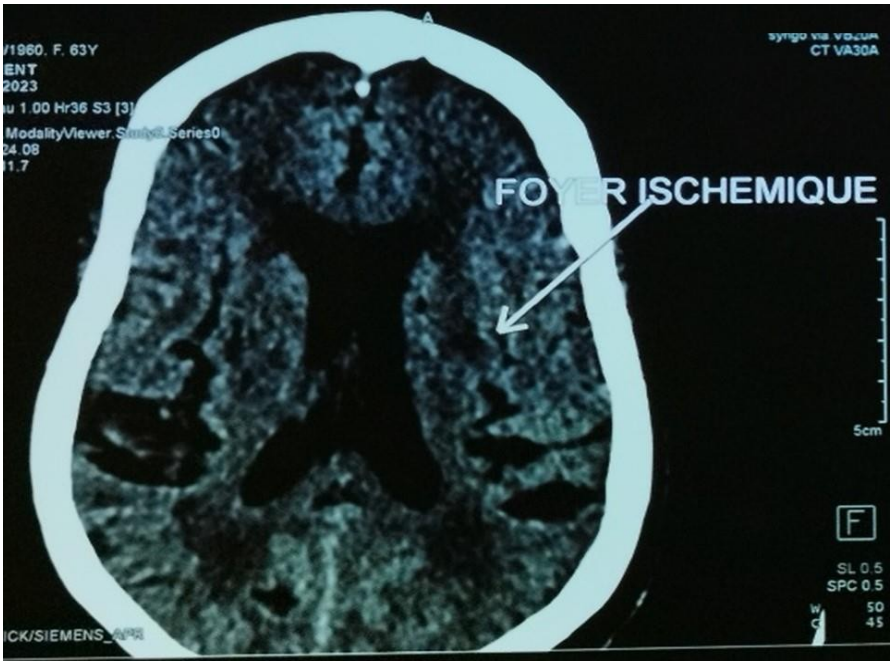

Figure 1. Cerebral CT scan showing ischaemic strok.

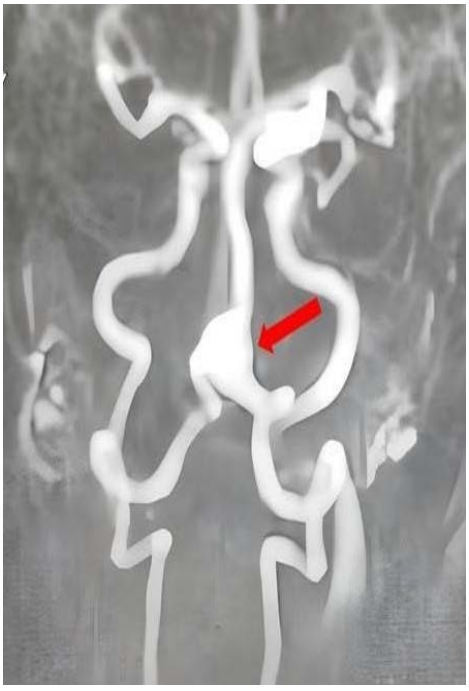

Figure 2. Cerebral MRI angiogram showing a saccular aneurysm of the basilar trunk.

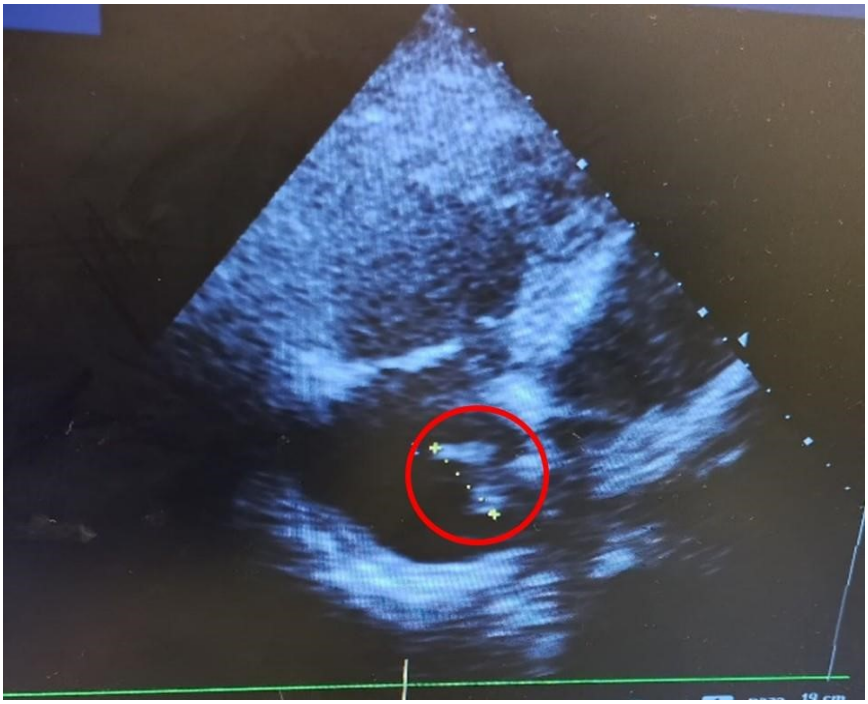

Figure 3. Transthoracic Doppler echocardiography showing a right atrial serpentine thrombus.

probable with a modified Geneva score of 15. We adopted the diagnosis of DVA complicated by pulmonary embolism in the setting of a basilar trunk aneurysm. The patient was transferred to the cardiology department, where she received oxygen therapy and thrombolysis with streptokinase. The immediate outcome 6 hours later was the sudden death of the patient due to the onset of cardiogenic shock.

3. Discussion

The discovery of an intracranial aneurysm, although rare, is not exceptional. Several patients present with subarachnoid haemorrhage, sometimes by chance [4]. There is little epidemiological data on basilar trunk aneurysms in the African context. Previous studies found a prevalence of 8.3% of basilar or posterior aneurysms [5]. These same studies also showed that these aneurysms were significantly associated with ruptures [5]. Cerebral ischaemia associated with aneurysms of the vertebrobasilar system is rarely described. GARY K. *et al.* in their series noted that two patients with ruptured aneurysms presented with occlusion of a vertebral artery four days later [6]. Large aneurysms are generally accompanied by vasospasm, which impairs neurological function and is life-threatening. However, the MRI angiography performed in our patient did not reveal any vasospasm in the arteries of the basilar system.

The most commonly described aneurysms are often fusiform [7] and generally associated with a risk of aortic dissection [8]. However, our patient's MRI revealed a saccular aneurysm in the basilar trunk with atheromatous calcifications of

the carotid bifurcations. Some authors suggest that the existence of vertebral artery asymmetry may correlate with deformity of the vertebro-basilar system [9].

Intracranial aneurysms sometimes present neurosurgeons with a challenge for surgical cure. In the series reported by Drake *et al.* 66% of large vertebrobasilar aneurysms were inoperable [5] [6]. In less than 5 years after the onset of clinical manifestations, more than 80% of giant aneurysms presented enormous handicaps or died from cerebral compression or arterial thrombosis [10] [11].

Intracranial aneurysms are generally associated with polycystic kidney disease. In our patient, the limitations of the morphological examinations did not allow us to exclude a possible association with polycystic kidney disease.

Any location is possible. Ryuzaburo Kochi *et al.* reported a vertebral artery aneurysm associated with vertebral artery ischaemia in a middle-aged woman [7]. This is a rare and morbid association with very poorly codified management.

In developed countries, because of the possibility of rupture or thrombosis, a surgical clip is widely used. Unfortunately, this can be complicated by occlusion of the cerebral bypass conduits [12]. In our case, despite neuroprotective treatment, thrombolysis was carried out because of the severity of the pulmonary embolism. The absence of treatment leads to mortality in 100% of cases of right intracavitary thrombi [13]. However, there is still no consensus on the management of thrombi in the right cavities, as there is as yet no unanimity among practitioners. As a result, it is not clearly defined in the European or American recommendations on the management of pulmonary embolism [14]. Elsewhere, embolectomy has given satisfactory results [15]. Some authors believe that thrombolytic agents cause thrombi to migrate into the pulmonary system, with dreadful consequences [16]. Indeed, Ibrahim *et al.*, and Athappan *et al.* reported respectively 20.4% and 23.2% mortality of right heart thrombi [17] [18]. The absence of emergency treatment other than fibrinolysis could explain this high mortality in our context.

4. Conclusion

Basilar trunk aneurysms are rarely described in the literature. They are usually discovered by chance, as clinical manifestations only occur in the event of complications or compression. The occurrence of thromboembolic disease always leads the practitioner to question the aetiology, which may be aneurysmal.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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