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Case Report

Tetraparesis following an Anterior Circulation Stroke: A Case Report

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Keywords

Azygos variant · Stroke · Tetraparesis · Aneurysm

Abstract

The azygos anterior cerebral artery (AACA) is a large single anterior cerebral artery that supplies both medial territories of the anterior cerebral hemispheres. Occlusion of the AACA can result, therefore, in bifrontal infarction. We report a patient who suffered from a tetraparesis following a bilateral anterior cerebral artery territory infarction due to an occluded AACA and provide a brief review of the literature.

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Introduction

The azygos anterior cerebral artery (AACA), an anomaly of the circle of Willis, is a large single anterior cerebral artery (ACA) that supplies both medial territories of the anterior cerebral hemispheres. It has an incidence rate of 0.3–2.0% in adults [1, 2]. The AACA results from two vessels that instead of forming two ACA, fuse to one midline artery [3]. The AACA can be associated with other anomalies such as saccular aneurysm or arteriovenous malformation [4]. As the AACA is responsible for the perfusion of both anterior cerebral hemispheres, occlusion of the AACA results in bifrontal infarction [1, 5]. We describe a patient who suffered from a tetraparesis following a bilateral ACA territory infarction due to an occluded AACA.

Case Description

A 62-year-old female patient complained of headache and slipped shortly after into a somnolent state with her eyes turned towards the right. Family anamnesis revealed that she had multiple falls during the last days.

On admission to the emergency unit, the patient showed eye deviation to the right and reduced vigilance. The initial working diagnosis consisted of a complex-partial status epilepticus, confirmed by electroencephalogram. Levitiracetam 750 mg and midazolam 4 mg intravenously were administered; subsequently, lacosamide and clonazepam were added for ongoing electroencephalographic epileptic activity.

A head MRI was performed due to prolonged leg-pronounced tetraparesis; imaging showed bilateral subacute ischemic lesions in the perfusion territory of the ACA. Time-of-flight angiography revealed an unpaired ACA, in the form of an AACA, which was partially thrombosed. An arterio-arterial embolic event was considered as cause of the stroke (Fig. 1). Digital subtraction angiography showed two smaller aneurysms at the bifurcation of the AACA, which were left untreated after a careful risk-to-benefit evaluation. Aspirin and atorvastatin were initiated. The cardiac workup was unremarkable. The patient's clinical state remained unchanged, showing a psychomotor retardation, dysarthria, and tetraparesis (only a slight improvement of motor function of the right hand was noted). She was referred in a stabilized state to our clinic for rehabilitation and developed a progredient spastic paraparesis, while the initial upper extremity paresis recovered almost fully as well as the initial dysarthria. Cognitive performance improved drastically with a slight persistent cognitive slowing.

Discussion

The literature reports few cases of AACA causing a stroke or an intracranial hemorrhage due to an associated ruptured aneurysm.

AACA and Stroke

De Sousa et al. [1] reported a 63-year-old male patient with sudden lowering of his level of consciousness. The patient had a history of hypertension and diabetes. CT scan revealed an ischemic cerebral stroke in the typical irrigation territory of the bilateral ACA. Cerebral angiography evidenced an AACA with endoluminal thrombus, about 1 cm of its common origin, causing an ischemic stroke in the frontal lobe bilaterally and in the anterior regions of the corpus callosum. Rajasekharan and Deepak [5] described a 50-year-old male patient with sudden onset of quadriplegia who had suffered a bilateral anterior cerebral artery infarct; imaging showed an AACA infarct as cause of the quadriplegia.

AACA and Aneurysm

Huh et al. [4] presented three cases of AACA aneurysms among overall 781 cases of cerebral aneurysm. All three patients were elderly women presenting with subarachnoid hemorrhages. Small saccular aneurysms at the distal ends of the AACA were evidenced with cerebral angiography and CT-A. Lightfoote et al. [2] described the case of a 42-year-old man with headache of several months. CT scan showed a 4-mm densely enhancing soft tissue mass anterior to the suprasellar cistern with a punctate calcification in the expected position of the anterior communicating artery. A saccular unruptured aneurysm of the anterior communicating artery was suspected. However, intra-arterial digital subtraction angiography demonstrated a large

(4 mm diameter, 1 cm long) AACA, divided into two pericallosal arteries and two callosomarginal arteries in their typical positions. No intracranial aneurysm was seen. A 56-year-old female with sudden onset of severe headache and vomiting was reported by Kobayashi et al. [3]. CT scan showed a severe subarachnoid hemorrhage in the longitudinal fissure of the cerebrum. Cerebral angiography revealed an AACA and a saccular aneurysm at the peripheral bifurcation of this artery.

Conclusion

Quadriplegia following stroke is frequently due to posterior circulation occlusion (basilar strokes); however, anterior circulation occlusion due to AACA is an important differential diagnosis that equally deserves consideration.

Statement of Ethics

This material has not been published in whole or in part elsewhere; the manuscript is not currently being considered for publication in another journal; all authors have been personally and actively involved in substantive work leading to the manuscript, and will hold themselves responsible for its content.

Disclosure Statement

The authors declare that they have no conflict of interest.

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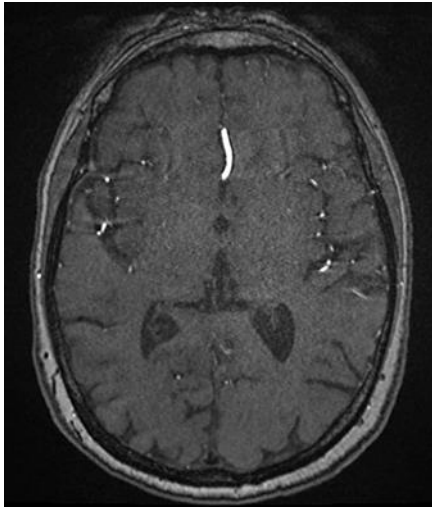


Fig. 1. Axial MRI angiography showing an azygos anterior cerebral artery (left).