

Persistent primitive hypoglossal artery associated with brain stem ischemia in a young patient

Persistência da artéria hipoglossal primitiva associada à isquemia do tronco cerebral em paciente jovem

Carlos Eduardo da Silva, Alicia Del Carmen Becerra Romero, Paulo Eduardo Freitas, Diego Ustárroz Cantali, Leonardo Sousa Melo, Eduardo Pardal, Verena Subtil Viuniski

Study carried out at Instituto de Cirurgia da Base do Crânio (ICBC), Porto Alegre RS, Brazil.

Department of Neurosurgery and Skull Base Surgery, Hospital Ernesto Dornelles, Porto Alegre RS, Brazil.

Correspondence: Carlos Eduardo da Silva; Departamento de Neurocirurgia e Cirurgia da Base do Crânio, Hospital Ernesto Dornelles; Avenida Ipiranga 1801 / 26; 90160-093 Porto Alegre RS - Brasil; E-mail: dasilvacebr@yahoo.com.br / carlos@icbc-neurocirurgia.com.br

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The persistent primitive hypoglossal artery (PPHA) is a carotid-basilar anastomosis. It may be associated with aneurysms, arteriovenous malformations and atherosclerotic disease¹. We report a case of brain stem ischemia in a young patient due to internal carotid stenosis and PPHA.

CASE REPORT

A 34-year-old Caucasian male with hypertension due to polycystic kidney disease was admitted into the hospital presenting sudden left paresthesia, quickly followed by transient left hemiplegia and hypoesthesia. Magnetic resonance imaging (MRI) at emergency showed a slight hypersignal in T2 and FLAIR on the topography of the pons. Magnetic Resonance Angiography displayed the presence of the PPHA and the stenosis of the right internal carotid artery, inferior to 50% (Figs 1 and 2). The patient was prescribed to aspirin 325 mg/day and atorvastatin 80 mg/day, with progressive recovering of the neurological deficits and with a good outcome in 12-month follow-up period.

DISCUSSION

The PPHA is one of the carotid-basilar anastomosis, which also include the persistent trigeminal, otic and proatlantal intersegmental arteries¹. These arteries are named according to their associated cranial nerves. They serve as anastomoses between the primitive internal carotid artery and the basilar artery¹. The hypoglossal artery originates from the cervical portion of the internal carotid artery (ICA) between C1 and C3. It traverses the hypoglossal canal, terminating in the basilar artery¹. The involution of these primitive arteries occurs as a result of the fusion

of the vertebral arteries with the basilar artery and the development of the posterior communicating arteries^{1,2}. They can, however, persist as carotid-basilar anastomoses, which communicate the anterior and the posterior circulations¹.

PPHA angiographic frequency lies between 0.027 and 0.26%, and the left PPHA is more frequent (65%) than the right one¹. The diagnostic criteria are: (a) the artery leaves the ICA as an extracranial branch; (b) the artery passes through the hypoglossal canal^{1,3}.

PPHA may also be associated to kidney polycystic disease, which was observed in this case. It may be also associated with



Fig 1. Magnetic resonance imaging angiography. Yellow arrow – persistent primitive hypoglossal artery; red arrow – right internal carotid stenosis.

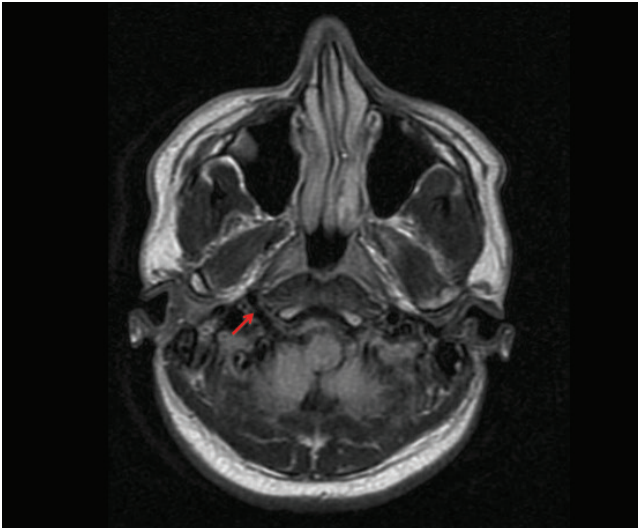


Fig 2. Axial magnetic resonance imaging; red arrow – persistent primitive hypoglossal artery crossing through hypoglossal canal.

other carotid-basilar anastomoses and bone malformation at the craniocervical junction^{1,4,5}.

The PPHA may serve as a pathway for an embolus from the ICA to reach the posterior circulation. Since the PPHA represents a complementary and compensatory artery for the vertebrobasilar system, an embolus from the ICA could reach the posterior circulation^{1,4,5}.

In patients with both carotid atherosclerosis and cerebrovascular disease in the vertebrobasilar territory, PPHA should not be ignored. Blood flow dynamics and the vascular anatomy play an important role in the origin and development of atherosclerosis⁴.

Any surgical approach should be performed with utmost care in order to maintain adequate cerebral perfusion in spite of ICA clamping, as the PPHA may provide most of the blood flow to the posterior circulation^{2,3}. In the present case, the patient was included in the group of the conservative management, according to the NASCET criteria, with a good outcome and recovering of the neurological function in the 12-month follow-up period.

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