

Bilateral paramedian thalamic and mesencephalic infarcts after basilar tip aneurysm coiling: role of the artery of Percheron

L. Rangel-Castilla; J. Gasco; B. Thompson y P. Salinas

Division of Neurosurgery. University of Texas Medical Branch (UTMB). Galveston. Texas.

Summary

Aneurysm embolization using Guglielmi detachable coils (GDC) is gaining acceptance as a viable alternative for surgery in the treatment of aneurysms. Recent reports describe a significant rate of thromboembolic complications. Thalamic and midbrain blood supply can arise from complex anatomical variations. The rare variation: "artery of Percheron", is a solitary arterial trunk arising from one of the proximal segments of a posterior cerebral artery and supplies the paramedian thalamic and rostral midbrain bilaterally. We describe a patient that underwent elective endovascular treatment for a basilar tip aneurysm using GDC and stents in each PCA; 12 hours later patient was comatose and not following commands. Sequential magnetic resonance imaging (MRI) of brain showed bilateral paramedian thalamic and mesencephalic infarcts presumably secondary to artery of Percheron occlusion. Thromboembolic event related to the use of the GDC embolization and stents is a rare clinical sequelae, but catastrophic. The use of antiplatelets agents should be reinforced in the scenario. When bilateral medial thalamic and midbrain infarcts are found, occlusion of the artery of Percheron should be considered. Angiography may not be helpful and lack of visualization of the artery does not exclude its presence. In this case the MRI findings confirmed the presence of the infarction based on the anatomical distribution.

KEY WORDS: Endovascular treatment. Coiling. Basilar tip aneurysm. Bilateral paramedian thalamic and mesencephalic infarcts. Artery of Percheron.

Infarto talámico paramedial bilateral y mesencefálico después del tratamiento endovascular de un aneurisma de la punta de la arteria basilar: rol de la arteria de Percheron

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Resumen

La técnica endovascular para el manejo de aneurismas está ganando auge como una alternativa a la cirugía abierta. Sin embargo, se han descrito diferentes complicaciones tromboembólicas relacionadas con esta modalidad. El flujo sanguíneo al tálamo y al mesencéfalo puede surgir de variaciones anatómicas complejas. La variación infrecuente: "arteria de Percheron", es una rama arterial solitaria que se origina del segmento proximal de una de las arterias cerebrales posteriores.

Presentamos un paciente que tuvo un procedimiento endovascular electivo para el tratamiento de un aneurisma de la punta de la arteria basilar; 12 horas después del procedimiento, el paciente estaba clínicamente en coma profundo. La resonancia magnética (RM) cerebral mostró infartos talámicos paramediales bilaterales y mesencefálicos, compatible con la oclusión de la arteria de Percheron.

Los eventos tromboembólicos relacionados con el uso de embolización con coil y stents es una rara pero catastrófica secuela. El uso de agentes antiplaquetarios se debe recomendar en este tipo de situaciones. Cuando existen infartos talámicos paramediales bilaterales y mesencefálicos, la oclusión de la arteria de Percheron se debe tener en mente. La angiografía puede no ser de mucha utilidad y la falta de visualización de la arteria no excluye su presencia. En este caso los hallazgos en la RM cerebral confirman la presencia de un infarto basado en la distribución anatómica de la arteria de Percheron.

PALABRAS CLAVE: Endovascular. Coil. Aneurisma cerebral. Arteria basilar. Infarto talámico paramediano bilateral y mesencefálico. Arteria de Percheron

Introduction

Endovascular embolization of cerebral aneurysms has evolved rapidly worldwide in recent years, and has increased in popularity at the expense of surgical clipping; how-

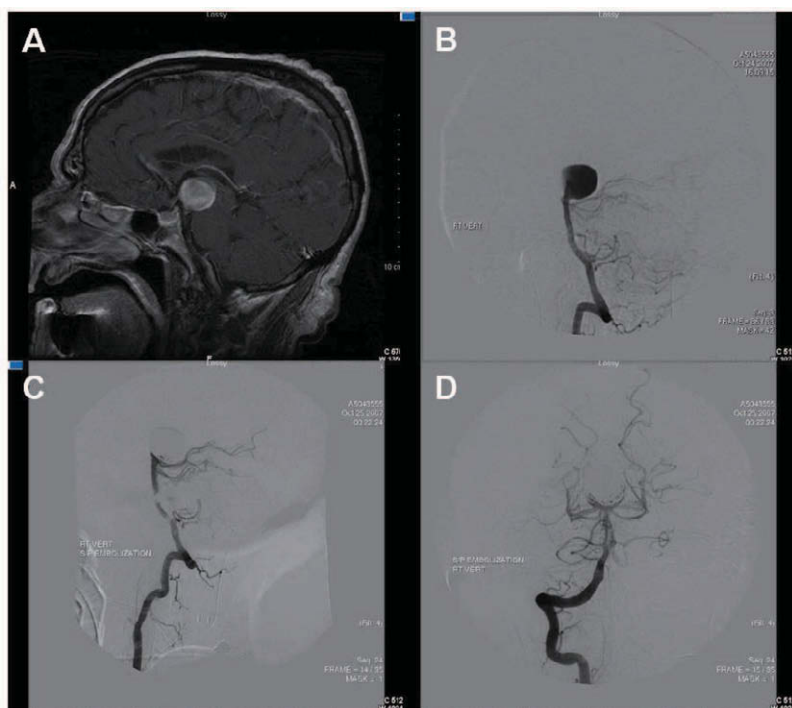


Figure 1. A. Sagittal T1WI MRI with contrast showing a 24 x 20 mm basilar tip aneurysm. B. Lateral view of right vertebral artery injection showing basilar tip aneurysm before coiling. C and D. Lateral and AP views of right vertebral artery angiography showing basilar tip aneurysm after successfully coiling with all major basilar artery branches presumably patent and no evidence of thrombosis compared with pre-coiling images.

ever, both methods have inherent risks. It has been described that embolization with coils is the preferred treatment for patients with ruptured basilar bifurcation aneurysms. There is evidence that in a healthy patient with ruptured aneurysms of either anterior or posterior circulation in which both surgical clipping and endovascular treatment are viable options, coiling is associated with a better outcome¹⁶. Aneurysm embolization using Guglielmi detachable coils (GDC) is gaining acceptance as a viable alternative to surgery. Although, recent reports describe a significant rate of symptomatic thromboembolic complications with GDC use, many of the neurological deficits found are transient and most of are caused by catheter manipulation, especially in the case of the balloon-assisted technique¹³. Thromboembolic events related to the use of GDC embolization are relatively common¹⁴, occurring in up to 28% of GDC embolization patients and resulted in persistent deficit in 5% of patients in one series⁸. Clinical sequelae are rare, but the high rate of occurrence suggests that alteration in the technique, such as the addition of antiplatelet agents, should be considered¹². The use of diffusion weighted (DW) magnetic resonance imaging (MRI) is being used to determine the frequency and radiological appearance of thromboembolic events during embolization. Some authors have reported an incidence of acute ischemic lesion in only 10% of patients that underwent endovascular treatment based on DW and fluid-attenuated inversion recovery (FLAIR)¹. Other authors found new hyperintense lesions in 61 to 69% of patients based on DW images¹⁴.

Acute ischemic strokes in the brainstem secondary to

vascular occlusion arising from the posterior circulation are catastrophic and carry a poor prognosis. Thalami and midbrain receive their blood supply from both anterior and posterior circulation, and several variations in this supply are known to exist. The posterior circulation usually supplies the medial aspects of the thalami and midbrain via branches arising from P1 segments and the lateral and superior aspect with branches arising from P2 segments of the posterior cerebral arteries (PCAs). Percheron studied the variations of this arterial supply and its distributions and described three different types of supply origins from P1 segments. In the second variation described by Percheron, there is a common trunk arising from one of the P1 segments providing bilateral distribution. Occlusion of this trunk results in bilateral infarctions in the middle aspects of thalami and brain stem. We describe clinical and MRI findings in a patient who developed infarctions in the typical distribution of the artery of Percheron after endovascular embolization of a basilar artery aneurysm.

Case report

We present a 71 year old male who had a history diabetes mellitus and hypertension, was diagnosed with basilar tip aneurysm (13x10 mm) in July 2003 by computer tomography (CT) angiogram. At time of diagnosis, patient refused treatment and was lost to follow-up. Patient returned to the ER in October 2007 with sudden onset of occipital headache, dizziness, and blurred vision. On examination, he was found to be neurological intact. Magnetic resonance imaging showed a basilar tip aneurysm (Fig 1A)

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