Spontaneous thrombosis of aneurysm and posterior cerebral artery

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Resumen

Los aneurismas que se originan en la arteria cerebral posterior tienen particularidades que los distinguen de otros aneurismas intracraneales. También son raros, representando sólo el 0,7% y el 2,3% de todos los aneurismas intracraneales, con una tendencia mayor a ser grande o gigante. Trombosis parcial de los aneurismas gigantes es un fenómeno relativamente común, sin embargo trombosis total es un fenómeno poco frecuente. Este es un caso de un paciente que se presentó con déficits visuales asociadas con convulsiones. Sobre la investigación complementaria, se le diagnosticó un aneurisma gigante parcialmente trombosado en la arteria cerebral posterior. Ese paciente fue remitido a nuestro servicio para realizar el tratamiento endovascular. Se realizo una resonancia magnética que mostró trombosis total de la lesión con la oclusión del vaso portador. Para confirmar este hecho, una nueva angiografía cerebral se llevó a cabo lo que confirmó la oclusión espontánea del aneurisma y la arteria cerebral posterior. Esta situación, con la oclusión del aneurisma y el vaso original representa un acontecimiento raro, con sólo unos pocos casos descritos en la literatura.

Palabras clave: Aneurisma intracraneal, aneurisma de la arteria cerebral posterior, aneurisma intracraneal gigante, Angiografía cerebral, Trombosis Intracraneal.

Abstract

Aneurysms originating in the posterior cerebral artery have particularities which distinguish them from aneurysms in other intracranial circulation vessels. They are also rare, representing only 0.7% to 2.3% of all intracranial aneurysms, with an even greater tendency to be large or giant. Partial thrombosis of giant aneurysms is a relatively common phenomenon, however total thrombosis is an infrequent phenomenon. This is a case of a patient who presented with visual deficits associated with seizures. Upon complementary investigation he was diagnosed with a giant aneurysm, partially thrombosed, in the posterior cerebral artery. That patient was referred to our department to perform endovascular treatment. A magnetic resonance imaging was then performed and showed a total thrombosis of the lesion with occlusion of the carrier vessel. To confirm this fact, a new cerebral angiography was performed which confirmed the spontaneous occlusion of the aneurysm and the posterior cerebral artery. This situation, with occlusion of the aneurysm and its vessel of origin represents a rare event, with only a few cases reported in the literature.

Key words: Intracranial Aneurysm, Posterior Cerebral Artery Aneurysm, Giant Intracranial Aneurysm, Cerebral Angiography, Intracranial Thrombosis.

Introduction

Aneurysms originating in the posterior cerebral artery (PCA) are rare, representing only 0.7% to 2.3% of all intracranial aneurysms[1]. These represent an even greater tendency to be large or giant[1]. Partial thrombosis of giant aneurysms is a relatively common phenomenon, however total thrombosis is an infrequent phenomenon and may be associated with the occlusion of its carrier vessel[2].

The present paper has the objective of relating a case of a patient with a posterior cerebral artery aneurysm which evolved into thrombosis in the carrier artery. We also perform a brief literature review about the subject.

Case report

This was a male patient, 17 years old, who was attended at other service, complaining of blurred vision, headache and 3 episodes of generalized tonic-clonic convulsive crisis, which had occurred three months prior to admission. Upon being examined neurologically, the only alteration found was a visual deficit, observed with a direct confrontation examination. The solicited campimetry exam showed right homonymous hemianopsia. Upon complementary investigation, the cranial computed tomography (CT) showed a hyperdense expansive lesion adjacent to the left PCA (Figure 1A), which presented partial and homogenous opacification following the contrast injection (Figure 1B). The main diagnostic hypothesis was a partially thrombosed giant aneurysm of the PCA. It was performed a cerebral angiography (CAG) that demonstrated the presence of a giant saccular aneurysm in the P2 segment of the left PCA (Figure 2A-C-E).

The patient was sent to our service for endovascular treatment. A cranial Magnetic Resonance Imaging (MRI) was performed and, to our surprise, showed a heterogeneous signal lesion, suggesting a totally thrombosed giant aneurysm in the P2 segment of the left PCA, with PCA occlusion at P2 segment (Figure 3). Given this result, we performed a new cerebral angiography that confirmed the total occlusion of the aneurysm and the posterior cerebral artery (Figure 2B-D-F). Thus, the patient was discharged from the hospital using an anticonvulsant, which was discontinued gradually after 6 months. The previous visual deficit remains.

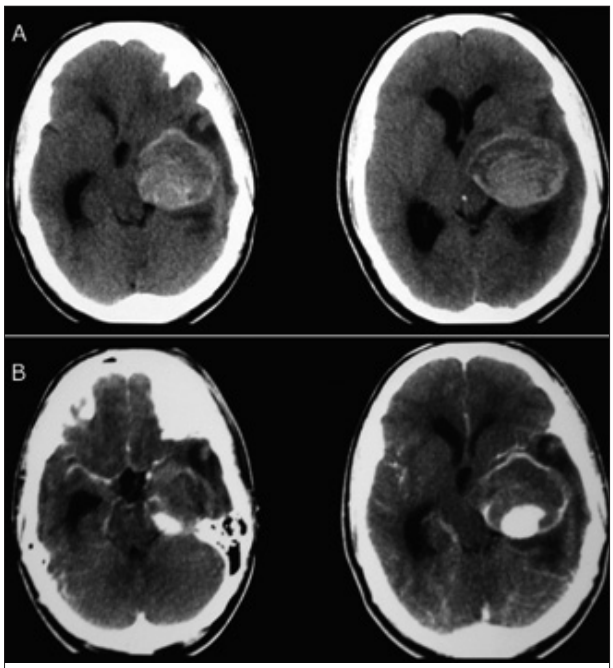

Figure 1 A - B. Cranial computed tomography in axial acquisitions showing an expansive lesion in the topography of the left posterior cerebral artery, with an important mass effect. In B, one can observe the partial opacification by means of a venous contrast.

Discussion

Aneurysms originating in the PCA have particularities which distinguish them from aneurysms in other intracranial circulation vessels[1]. In a study by Wang et al[1], the average age that these aneurysms appear was 36 years, different from that of the other aneurysms, which vary between 50 and 60 years. In addition, it has been observed that the PCA aneurysms tend to be larger, being classified as large or giant in 30% of the cases[3].

Still in relation to the age bracket stricken by aneurysms at this site, the study by Liang et al[4] on patients aged 15 to 18 years showed that posterior circulation aneurysms represented 25% of all aneurysms this group is stricken with[4]. Such lesions, also according to these authors, present greater probability of being large or giant4. The same study highlighted the greater frequency of complete or partial spontaneous thrombosis of aneurysms in this population[4].

Schaller et al[5] observed that the clinical presentation of giant aneurysms with spontaneous thrombosis, in the absence of subarachnoid hemorrhage, frequently includes paroxysmal neurological signs, such as epileptic crises or ischemic events, possibly even mimicking dementias. The ischemic events may originate from the occlusion of the carrier artery, along the extension of the intraluminal thrombus, or from the compression of the adjacent vessels by the aneurysm [6]. Furthermore, such ischemic events may occur in a distal site from the aneurysm when there is the release of thrombi from the same[6]. The location of the lesion, considering its clinical presentation, is not easy to determine due to the non-specificity of the symptoms[6]. Thus, in some circumstances the aneurysm may manifest itself due to the expansive effect, simulating the presentation of cerebral tumors[6], as was the occurrence in this case. The greatest incidence of the formation of thrombi in giant aneurysms has been related to the relation between the volume and the aneurysmal neck, with a greater occurrence in those in whom the neck is proportionally smaller[6]. Other parameters involved in the thrombosis process of the aneurysm are the age of the aneurysm, the distortion of the afferent artery by the aneurysmal sac and endothelial damage by the turbulent intrasacular flux[6,7]. In a study on giant aneurysms, Roccatagliata et al[2] observed the evolution to aneurysmal thrombotic occlusion in 39.1% of their sample group, concluding that the precise moment the thrombosis occurred could not be determined, as it had not been related to any definite clinical event.

In accordance with Roccatagliata et al[2], the spontaneous evolution of these aneurysms from partial to total thrombosis represents the natural history of the same, but not necessarily their outcome. Therefore, continuing along the lines these same authors followed, the partially thrombosed giant aneurysms present intramural rather than intraluminal thrombi, in addition to neovascularization of the adventitial layer and some inflammatory activity. These characteristics, along with the occurrence of small hemorrhages and subsequent coagulations, which continue to occur even after a total thrombosis, help to understand their growth even in

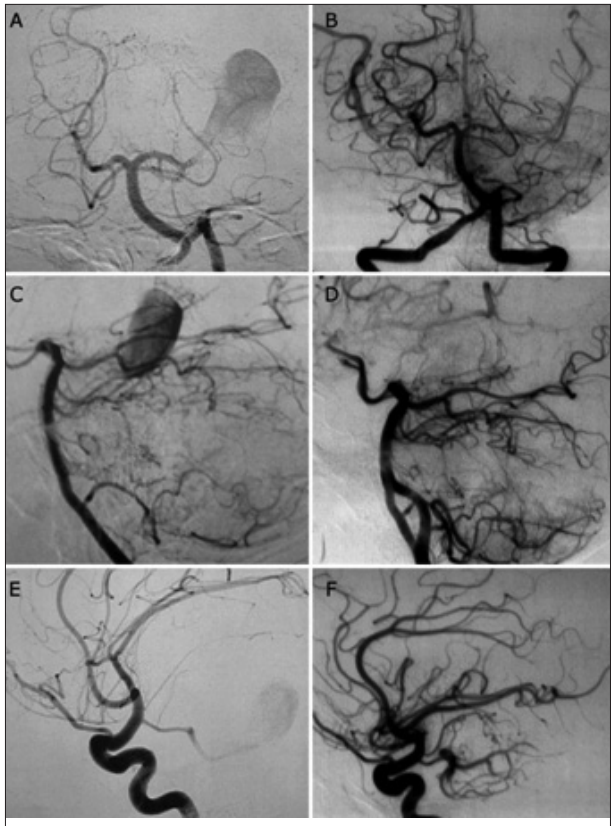

Figure 2. Cerebral angiography showing a giant aneurysm in the left posterior cerebral artery (first column); cerebral angiography after 3 months demonstrating occlusion of the left posterior cerebral artery in its P2 segment, without opacification of the aneurysm (second column) (A, B - left vertebral / towne; C, D - left vertebral / lateral; E, F - left carotid / lateral).

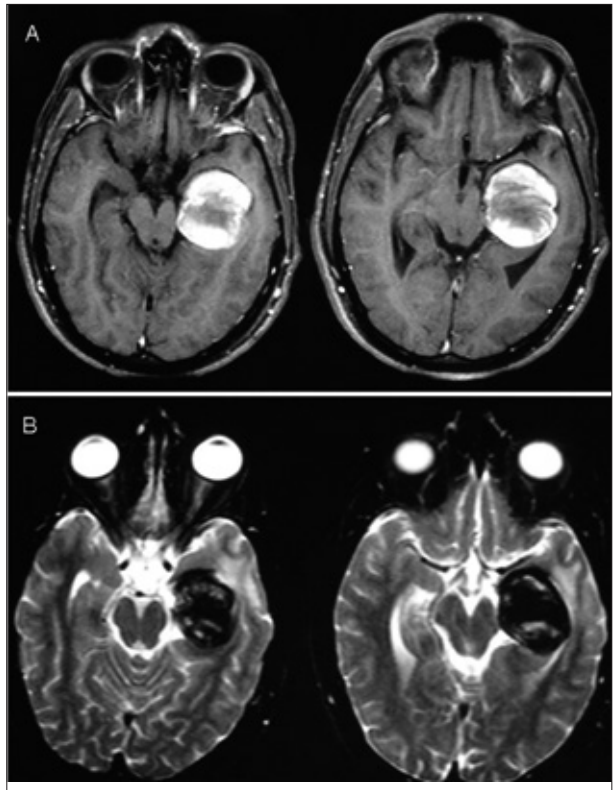

Figure 3. Cranial Magnetic Resonance Imaging in axial acquisition (A - T1-weighted; B - T2-weighted) showing an expansive lesion, with heterogeneous signal, suggesting a totally thrombosed giant aneurysm with occlusion of the posterior cerebral artery.

the absence of the usual hemodynamic factors[2].

In relation to the diagnostic investigation of thrombosed aneurysms, we can state that the MRI came to assist in the follow-up and understanding of partially thrombosed or totally occluded aneurysms[8]. Before exclusion from circulation by the aneurysmal thrombosis, it is possible to observe, using MRI, that the aneurysms with intramural thrombi have a larger diameter than their perfused lumen and that the aneurysmal wall may contain thrombi of different ages. This fact confers to the partially thrombosed aneurysmal wall the role of the biological activity of these aneurysms[8]. The use of angiography for the diagnosis of totally thrombosed aneurysms is reduced because the same have been excluded from circulation, however careful analysis of the literature allows for the observation that the completely normal angiography in these cases is uncommon, and frequently allowing for the visualization of the residual neck[9].

As for the best form of radiological follow-up of partially or totally thrombosed aneurysms, it has been observed that the cerebral angiography is routinely utilized in studies on this subject, the MRI being reserved for situations in which the evaluation of the aneurysmal body became necessary, assisting in the better understanding of the same[2,6-10].

There is no consensus on the management of totally thrombosed aneurysms[2,8-10]. Surgical intervention has been reserved for lesions that produce a mass effect, having the option of emptying, of clipping and even of the association with a bypass[5,7]. In view of the expectant conduct, the serial imaging follow-up is mandatory, bearing in mind the possibility of recanalization[10]. Recanalization of completely thrombosed aneurysms, albeit rare, has already been documented in the literature in case studies such as those of Lee et al[10] on the giant aneurysm in the posterior cerebral artery of a youth of 18 years of age.

Hence, we conclude that the dynamic behavior, with possible growth or aneurysmal recanalization, even in cases of completely thrombosed aneurysms, make the serial follow-up of the same mandatory, the MRI being a good option for possible visualization of intramural thrombi, and of the light and total volume of the aneurysm.

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