CLINICAL IMAGE

A traumatic aneurysm of the pericallosal artery

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Keywords - Intracerebral hemorrhage, brain trauma, traumatic aneurysm, peicallosal artery aneurysm

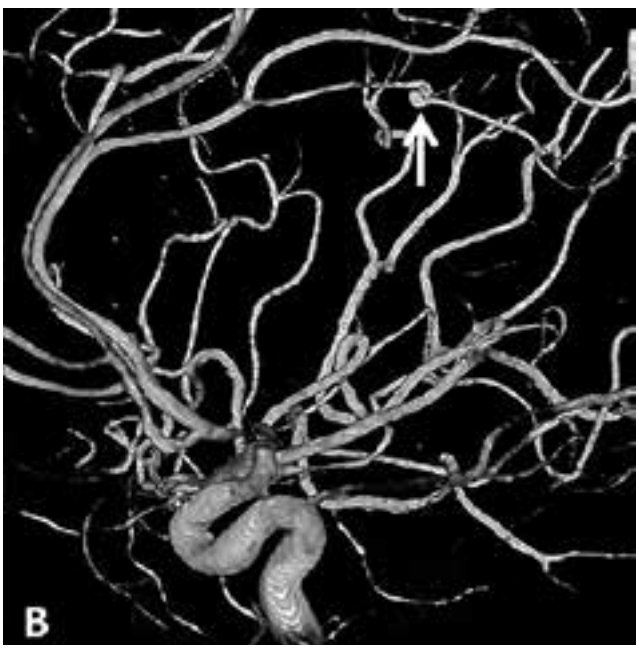
A 28-year-old man hit a deer while driving his car. He was found comatose at 25 meters distance from the damaged car. On admission his Glasgow Coma Score was 5 (E1M3V1). A computer tomography (CT) scan showed a large haematoma in the corpus callosum (*figure 1*) without skull fractures. In addition, there was a severe lung contusion with multiple rib fractures. The location of the cerebral bleeding raised the suspicion of a false aneurysm. His respiratory condition required high pressure ventilation, which made early angiography impossible. After 6 days his respiratory condition had stabilized. Cerebral angiography revealed a 2 mm false aneurysm on the right distal pericallosal artery with circumferential involvement of the small vessel (*figure 2, arrow*). Apparently, the artery was torn under the sharp free edge of the falx cerebri. Endovascular parent vessel occlusion or trapping were considered the only possible therapies in this patient. A microcatheter was navigated just proximal to the aneurysm and a small amount of n-butylcyanoacrylate glue (Histo-acryl, Braun, Melsungen, Germany) mixed with Lipiodol (Guerbet, Rossy, France) was injected. The glue first occluded the parent artery distal to the aneurysm and subsequent reflux occluded the aneurysm itself and the proximal parent vessel (*figure 3*, glue in the aneurysm (arrow) as well as in the proximal and distal parent artery). A control angiogram confirmed the exclusion of the aneurysm from the circulation. The patient was weaned from the respirator. An intensive rehabilitation followed in subsequent months after which he made a reasonably good recovery. The function of his left hand was still impaired and he had difficulty speeking. He is currently at home and one year later, he is learning how to drive again in an adjusted car.

Traumatic intracranial aneurysms are rare; approximately 1 percent of all intracranial aneurysms are traumatic.[1] Traumatic intracranial aneurysms are most commonly described after penetrating brain injury; approximately 20 percent

Figure 1.

Figure 3.

Figure 2.



of traumatic aneurysms after traumatic brain injury are caused by penetrating brain injury.[2] Nevertheless, traumatic intracranial aneurysms can be seen after closed head trauma as well. Severe closed head trauma may damage an intracranial artery adjacent to a (fractured) bony structure or sharp edge of the dura. The most common locations of traumatic aneurysms in the absence of fractures are the internal carotid artery next to the clinoid process and the pericallosal artery alongside the free edge of the falx.[2] When the arterial tear is across the entire vessel wall, the arterial rupture will cause an immediate haemorrhage, as in our patient. With partial disruption of the arterial wall, delayed haemorrhage may occur when the pseudo-aneurysm later ruptures.[1] Mortality rates as high as 50 percent are described due to delayed intracranial haemorrhage. Traumatic aneurysms represent a surgical challenge due to unusual locations, thin walls, and poorly defined necks in a frequently unfavourable clinical setting. In contrast, endovascular treatment is usually straightforward.[4] Since after selective coiling the traumatic aneurysm may keep on growing with possible repeat haemorrhage, endovascular parent vessel occlusion with glue or coils, is the treatment of choice wherever possible.[5,6]

The pericallosal artery, the part of the anterior cerebral artery distal to the anterior communicating artery is the primary supplier of blood to the midline of the brain, vascularizing the corpus callosum, the optodiencephalic area, and the anterior two thirds of the medial and superomedial aspects of both hemispheres. Various anatomical variations of the pericallosal arterial complex are described. Obliteration of the same arterial segment may or may not produce important clinical consequences, depending on the available blood-supplying channels.[7] Contralateral hemiparesis with lower limb predominance, speech disturbances, psychomotor slowing and apraxia are the most common symptoms in patients with a pericallosal artery infarction.[8]

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