Ruptured distal anterior cerebral artery aneurysm presenting as subdural hemorrhage

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Abstract

We report on a 64-year-old man with no history of trauma who went into a deep coma after aneurysmal rupture. The brain computed tomography (CT) scan showed interhemisphere and convexity subdural hemorrhage (SDH) without detectable subarachnoid hemorrhage. The CT angiography confirmed a rare condition of pericallosal aneurysmal rupture. We emphasize that when a patient with an unclear history of head trauma presented with acute convexity and interhemispheric SDH, the possibility of distal pericallosal artery aneurysmal rupture should be considered. We also recommend CT angiography must be performed as soon as possible to determine the cause of bleeding.

Keywords: aneurysmal rupture; CT angiography; pericallosal artery; subdural hemorrhage

1. Introduction

Acute subdural hemorrhage (SDH) is commonly seen in the emergency department in patients who have had traumatic brain injury. Its etiology often results from tearing of bridging and/or cortical veins; however, a distal anterior cerebral artery (DACA) aneurysmal rupture is a very rare condition.1–10 In this report, we describe a man in a deep coma in whom an acute subdural hemorrhage caused by distal cerebral artery aneurysmal rupture was diagnosed.

2. Case Report

A 64-year-old male patient with no medical history presented to the emergency department with consciousness disturbance. He was found lying in the bathroom, and history of head trauma was uncertain. At the emergency department, his initial physical examination showed blood pressure of 229/103 mmHg, bradycardia of 56 beats/minute, and a body temperature of 35.6°C. The patient's coagulation profile was normal. Upon neurological examination, he was found to be comatose with an abnormal decerebrate posture and Glasgow Coma Scale score of E1VTM2. Both pupils were dilated and the light reflex was trace. Brain computed tomography (CT) revealed a right cerebral convexity hyperdense crescent SDH continuous with a wedge-shaped interhemispheric SDH and with the midline structure displaced to the left (Fig. 1). There were no associated brain contusions or SAH (Subarachnoid hemorrhage). After consultation with the neurosurgeon, CT angiography was performed because of the patient's unusual presentation. The imaging result showed a rod-like aneurysm of the right cerebral pericallosal artery (Fig. 2A and B). His Hunt and Hess clinical grade was V. Endovascular coiling was unable to relieve the mass effect of hematoma, so we suggested craniotomy for clipping of the aneurysm and removal of the
hematoma. However, the patient received conservative treatment out of respect for the requests of his family because of his overall poor general health condition and poor neurological prognosis. The patient expired 2 days after onset of treatment.

3. Discussion

Acute SDH most commonly results from the tearing of bridging and/or cortical veins. The incidence of subdural bleeding secondary to rupture of an intracranial aneurysm is rare, with an incidence of 0.5–7.9%. Among ruptured aneurysms, most patients with distal anterior cerebral artery (DACA) aneurysms present with classic spontaneous subarachnoid hemorrhage symptoms. DACA ruptured aneurysms resulting in interhemisphere SDH associated with convexity SDH without subarachnoid hemorrhage have been reported in only five cases to date.

In this setting, because of its rarity, an aneurysm may be overlooked in an emergency room setting as it was in our case, and potentially catastrophic consequences may occur based on the high percentage of early rebleeding related to cerebroarterial aneurysms. Thus, when a convexity SDH is continuous with interhemispheric fissure SDH as seen on the CT scans of our case, the possibility of a pericallosal artery aneurysmal rupture must be considered in the differential diagnosis.

The mechanism of this unusual CT feature could be the result of pericallosal aneurysm rupture occurring in the narrow interhemispheric space, so as to force and spread the blood into the subdural space along the convexity surface causing this unique CT feature.

In most SDH cases caused by ruptured aneurysm, the clinical grades are severe. The outcome of these patients is generally poor and significantly correlated with admission grade, midline shift, and SDH volume. However, a good prognosis can be achieved if early diagnosis involves treatment with aneurysmal clipping and hematoma removal. In the case of our patient, his admission Hunt and Hess clinical grade was V, the midline shift was 2.5 cm, and the SDH was 3.0 cm in width. These findings indicated that our patient's prognosis would be poor. However, we want to emphasize routine evaluation of patients with SDH and no history of trauma using CT angiography in the emergency department to help identify aneurysms early, so that prompt and appropriate therapy can be given to prevent poor outcomes.

We conclude that when a patient presents with an acute convexity and interhemispheric SDH with unclear head trauma history, the possibility of spontaneous pericallosal artery aneurysmal rupture should be considered. CT angiography must be performed as soon as possible to seek the cause of bleeding.

![Fig. 1. Brain computed tomography scan shows acute subdural hemorrhage at right frontotemporoparietal lobe 3 cm in thickness (thick arrow) and continuous to interhemisphere (thin arrow), causing severe midline shift to left.](image1)

![Fig. 2. (A and B) Postcontrast computed tomography (CT) scan of the brain with CT angiography revealed one 9 mm rod-like hyperdense lesion at anterior pericallosal region (arrow).](image2)
Conflicts of interest

All authors have no conflicts of interest to declare.

References