Acute Subdural Hematoma in Patients with Intractable Epilepsy

—Report of Two Cases—

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Abstract

When trauma occurs secondarily to a generalized seizure in patients with intractable epilepsy, even a simple subdural hematoma may be fatal if there is a delay in diagnosis. We encountered two such patients, both of whom suffered an acute, fatal subdural hematoma without cerebral contusion (simple subdural hematoma) as a result of falling during a generalized convulsion. In some cases, ophthalmoscopic examination is critically important in the early detection of simple subdural hematoma.

Key words: acute subdural hematoma, simple subdural hematoma, preretinal hemorrhage, head injury

Introduction

Acute subdural hematoma as a result of traumatic injury may be classified as either complicated, in which a cerebral contusion is present, or simple, in which there is no cerebral contusion. The simple type has been known to develop following even minor head trauma, and it carries the better postoperative prognosis.⁵⁾ We treated two adults who suffered acute, simple subdural hematoma caused, in both cases, by a seizure-induced fall during long-term hospitalization for uncontrollable epilepsy. We describe these two cases and discuss the reasons for the delayed diagnosis.

Case Reports

Case 1: A 40-year-old female who had had seizures since the age of 8 years had been hospitalized for treatment of her uncontrollable epilepsy. At 11:00 a.m., she experienced a generalized convulsion and fell to the floor. The site of impact was uncertain. Although she was unconscious after the seizure, she was managed only by observation, since it was assumed that the unconsciousness was postictal in nature. However, she failed to regain consciousness

and was transferred to our hospital at 7:30 p.m. of the same day. On her arrival, the neurological examination revealed that she was in a deep coma. Her pupils were fully dilated and unreactive to light, and there were no other brain stem reflexes on either side. Ophthalmoscopic examination disclosed bilateral preretinal hemorrhages. Skull x-rays showed no fractures. Computed tomographic (CT) scans without contrast infusion revealed a hyperdense subdural hematoma covering the entire right cerebral hemisphere and a marked leftward shift of the midline structures (Fig. 1). Shortly after admission she ceased to breathe spontaneously, and she died the following day. The autopsy demonstrated acute subdural hematoma without cerebral contusion, but the source of bleeding was not discovered.

Case 2: A 20-year-old male with a history of generalized seizures from the age of 3 years was hospitalized with the diagnosis of Lennox syndrome. At 1:30 p.m., he had a generalized convulsion and fell on a mat that had been placed in his room to prevent head trauma. The site of impact was not determined. His ensuing coma was initially judged to be secondary to the seizure, but when it persisted for 3 hours he was transferred to our institution. On arrival he was in a deep coma; he was unresponsive to light and exhibited no other brain stem reflexes on either side. Ophthalmoscopic examination revealed bilateral preretinal hemorrhages. The skull x-rays

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Fig. 1 Case 1. CT scan demonstrating a hyperdense subdural hematoma over the entire right cerebral hemisphere, with a definite shift of the midline structures to the left side.

showed no fractures. Precontrast CT scans revealed a very dense subdural hematoma over the entire left cerebral hemisphere as well as a conspicuous shift of the midline structures to the right side (Fig. 2). An emergency decompressive craniectomy was performed, and the subdural clot was evacuated. No

Fig. 2 Case 2. CT scan showing a thick subdural hematoma over the left cerebral hemisphere, with a marked shift of the midline structures to the right side.

contusion was observed on the cortical surface, which indicated that the subdural hematoma was of the simple type. The bleeding source could not be identified. However, he failed to improve, and died 2 days after surgery.

Discussion

Both patients described above had intractable epilepsy and suffered a traumatic, fatal, acute subdural hematoma without cerebral contusion, in both cases caused by a fall during a generalized convulsion. The diagnosis of the lesion was delayed because the trauma was not recognized; the patients' unconsciousness was attributed to the epileptic seizure. Ophthalmoscopic examination revealed bilateral preretinal hemorrhages in both patients, however.

As mentioned, it was Jamieson *et al.*⁵⁾ who differentiated the simple type of traumatic acute subdural hematoma (without cerebral contusion) from the complicated type (accompanied by cerebral contusion). The mechanism of simple acute subdural hematoma, which often follows the sort of mild trauma that occurred in our two cases, has been postulated to be identical to that of infantile acute subdural hematoma, which originates from the rupture of a bridging vein.^{1,6)} Because craniocerebral disproportion has been emphasized as the cause of infantile acute subdural hematoma, we reviewed CT scans of our two patients that had been taken before their accidents for the purpose of evaluating their epilepsy (Fig. 3). These CT scans showed neither the cerebral atrophy that is indicative of craniocerebral disproportion nor any other abnormalities. Regrettably, we were unable to identify the

Fig. 3 CT scans taken before the trauma (*left*: Case 1; *right*: Case 2), revealing an absence of the cerebral atrophy that accompanies craniocerebral disproportion and indicating no other abnormalities.

source of bleeding in either patient.

Contrary to the theory of a venous origin, some authors^{3,4,9)} have recently argued that acute, traumatic subdural hematoma may frequently be of arterial origin. They propose that such arterial hemorrhage results, at the time of minor head trauma, from the rupture of an arterial twig attached to the dura mater. This proposed mechanism may be applicable to acute subdural hematoma in patients with intractable epilepsy. A nearly asymptomatic hemorrhage in the subdural and/or subarachnoid space, coupled with minor but frequent head trauma secondary to epileptic seizures, results in adhesion of cortical arteries to the dura mater. Under these conditions, even a slight trauma to the head may be followed by subdural hemorrhage due to the rupture of an artery attached to the dura mater.

It has been stated that, in adults, the outcome of surgery for traumatic subdural hematoma is very poor.^{7,9)} The major reason for this, however, relates not to the subdural hematoma *per se*, but to the associated pathological processes in the brain parenchyma, such as cerebral contusion.²⁾ In fact, Jamieson *et al.*,⁵⁾ in presenting their classification, discussed the surgical results. According to their data, the mortality rate for the complicated type was 52.6% and for the simple type, 22.6%, which suggests that the absence of contusion is a significantly favorable factor.

Reportedly, it is critical that acute subdural hematoma be treated within several hours of the insult;⁸⁾ early craniotomy yields good results with the simple type in particular. It was most unfortunate, therefore, that the two patients described here were not promptly and properly diagnosed. Because both had intractable epilepsy with frequent seizures, their protracted unconsciousness was erroneously construed as postictal in origin. Earlier detection of the lesion may have prevented both deaths.

In conclusion, ophthalmoscopic examination shortly after a fall incurred during a seizure may be invaluable in the prompt detection of acute subdural hematoma. Preretinal hemorrhage was noted in both patients described here, and we recently found retinal and preretinal hemorrhages in 100% of 26 in-

fants with acute subdural hematoma.¹⁾ Finally, we would like to stress that the possibility of acute subdural hematoma in an epileptic patient who has fallen during a seizure should not be overlooked. Close observation during the postictal period, including ophthalmoscopic examination, is extremely important.

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