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Acute Subdural Hematoma with Negative Fibrin/Fibrinogen Degradation Product Findings

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Abstract Traumatic acute subdural hematoma (ASDH) patients are generally positive for fibrin/fibrinogen degradation product (FDP) or d-dimer. We herein report a patient with negative FDP findings who had ASDH on computed tomography (CT). A 71-year-old woman was hit by a light truck while riding on a motorcycle. She suffered recent memory disturbance. The FDP level after arrival at the hospital was negative; however, she had right, thin ASDH on CT. The post-admission course was uneventful. The takeaway from the present case is that physicians cannot deny the possibility of ASDH even when the FDP level in the acute phase is within the normal limits.

Keywords: *acute subdural hematoma, fibrin/fibrinogen degradation product, computed tomography*

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1. Introduction

Traumatic brain injury (TBI) is often encountered in emergency outpatients. Computed tomography (CT) is useful in such patients for an expeditious diagnosis and treatment, but CT is associated with potential risks of exposure to ionizing radiation.1 Patients with traumatic intracranial lesions generally have positive levels of fibrin/fibrinogen degradation product (FDP) or d-dimer. [1,2,3] Accordingly, d-dimer and FDP may be useful biochemical markers for diagnosing TBI. We herein report a case in which CT showed acute subdural hematoma (ASDH), but the FDP level was within the normal limits.

2. Case

A 71-year-old woman was hit by a light truck while riding a motorcycle and transported to our hospital by an ambulance 40 minutes after the accident. Her medical history included asthma, ulcerative colitis and uterine prolapse requiring ring pessary application. Her regular medication was 5-aminosalicylic acid and ursodeoxycholic acid without antiplatelet agents or anticoagulants. She had no remarkable family history. Upon arrival, she had transient recent memory disturbance associated with the injury, but her vital signs were normal. The patient's Glasgow Coma Scale was 15. She had right cheek and elbow contusions.

The only abnormal result found on a biochemical analysis of the blood was a C-reactive protein level of 1.27 mg/dL. There were no coagulopathy: prothrombin time, 11.3 second (control, 11.2); activated partial thromboplastin time, 34.6 second (control, 27.0); fibrinogen, 402 mg/dL; FDP, 2.5 μg/mL (normal limit, 1-5 μg/mL).

CT showed right, thin ASDH (Figure 1), confirmed by magnetic resonance imaging (MRI; Figure 2). She received a diagnosis of ASDH and was admitted. The post-admission course was uneventful, and she was discharged on the fourth hospital day after confirmation of the resolution of the ASDH on CT.

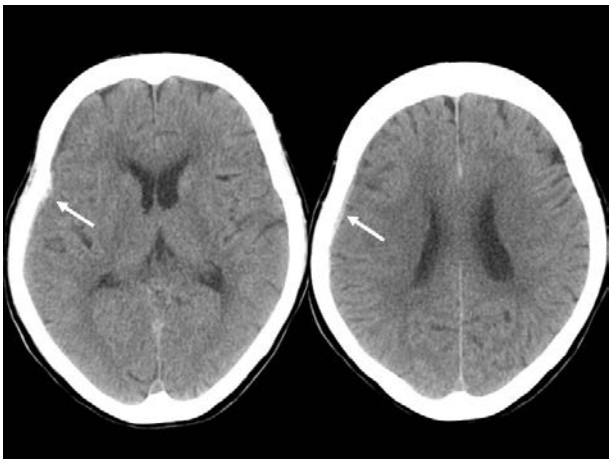

Figure 1. Compute tomography (CT) on arrival. CT showed right, thin ASDH (arrow)

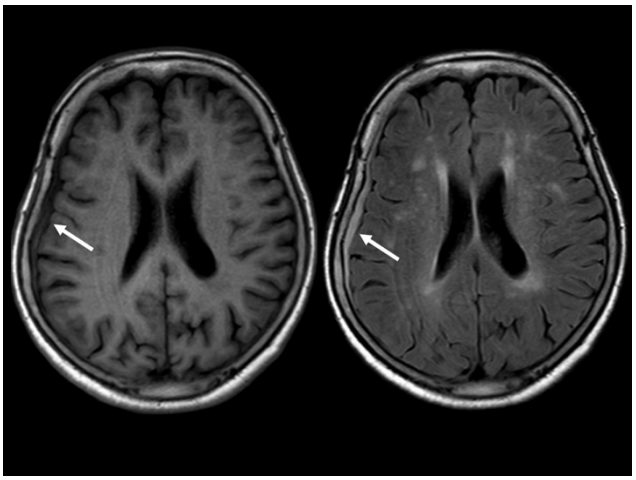

Figure 2. Magnetic resonance imaging (MRI) on arrival. MRI showed iso-intensity on T1-weighted imaging (left) and high-intensity acute subdural hematoma on fluid-attenuated inversion recovery imaging (right)

3. Discussion

To our knowledge, this may be the first case report showing that a patient with ASDH can have negative FDP findings. The levels of both FDP and d-dimer have been reported useful for the initial evaluation of the severity of trauma, massive blood transfusion, and mortality, and the levels of FDP and d-dimer are positively correlated. [4,5,6] Even in cases of isolated head injury, fibrinolytic markers such as FDP and/or d-dimer measured in the acute phase were shown to be useful for determining the prognosis of patients. [7,8]

Sugimoto et al. investigated the utility of coagulopathy and abnormal fibrinolysis for the detection of structural disorders in mild traumatic brain injury (TBI) using 73 patients with mild and isolated TBI (Glasgow Coma Scale [GCS] score 14-15). [1] The patients were classified into those with or without intracranial structural disorder, based on CT and MRI. As a result, both FDP and d-dimer levels were significantly different between the patients with and without structural disorder. However, there were a few cases in which the FDP levels were within normal limits even in cases of a structural disorder, so D-dimer became the only significant independent risk factor for identifying structural disorder after a multivariate logistic regression analysis. As this report is an original publication, the details concerning the structural disorders in the cases with negative levels of FDP could not be obtained. The mechanism underlying the negative FDP findings in patients with TBI might involve an extremely small amount of damage to the brain, resulting in a favorable prognosis. In addition, the use of anti-inflammatory agents, including salicylates for ulcerative colitis may also have an impact on the results.

The takeaway from the present case is that physicians cannot deny the possibility of ASDH even when the FDP level in the acute phase is within the normal limits. As the mechanism and prognosis underlying TBI with negative FDP findings on arrival is poorly understood, a further analysis with the accumulation of similar cases will be necessary.

4. Conclusion

Physicians cannot deny the possibility of ASDH, even when the FDP levels in the acute phase are within normal limits.

Conflict of Interest

The authors declare no conflicts of interest in association with the present study.

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List of Abbreviations

CT, computed tomography; MRI, Magnetic resonance imaging

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