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NEURO-IMAGES

Asymptomatic Brain Abscess with Intracerebral Hemorrhage

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Dear Editor,

A 44-year-old man with hypertension and diabetes presented with an acute headache and left hemiparesis. He reported recent inadequate control of blood pressure and diabetes. At the time of admission, his blood pressure was 240/130 mmHg, but fever and myalgia were absent. Immediate computed tomography (CT) revealed a right frontotemporal lobe intracerebral hemorrhage (ICH), and some areas of ICH appeared to be associated with other lesions (Fig. 1). Immediate surgery was performed because of rapidly deteriorating consciousness. After insertion of a catheter to the nearest ICH site, white purulent discharge was observed and irrigation was performed. Blood tests revealed unremarkable findings, with the exception of a slightly increased C-reactive protein level (0.12 mg/L). *Staphylococcus saprophyticus* was detected on culture, and vancomycin was given for 21 days. Postoperative CT confirmed that the fluid level disappeared and problems caused by the mass as a space-occupying lesion had nearly resolved (Fig. 2). The patient became more alert, and the left hemiparesis gradually improved.

Brain abscess typically presents with various neurological symptoms and is associated with high mortality [1]. It sometimes occurs in association with ICH, but may occur due to hematogenous spread from distal foci [2]. In a case of brain abscess, prompt diagnosis, timely surgical treatment, and antibiotic therapy are important for improving prognosis. In this patient, a brain abscess developed with ICH. It was thought that the abscess was caused by hematogenous spread from an unknown site and that uncontrolled diabetes contributed to abscess generation or exacerbation. Moreover, it is possible that the abscess was overlooked on initial brain imaging because of hemorrhage into the abscess cavity. Treatment for the abscess might have been delayed, but fortunately, the fluid level in the abscess cavity raised the suspicion of an abscess. This case demonstrates that an abscess can be overlooked when ICH invades the abscess cavity, although an abscess should be suspected in the presence of a fluid level and differences in density of the brain parenchyma around the ICH.

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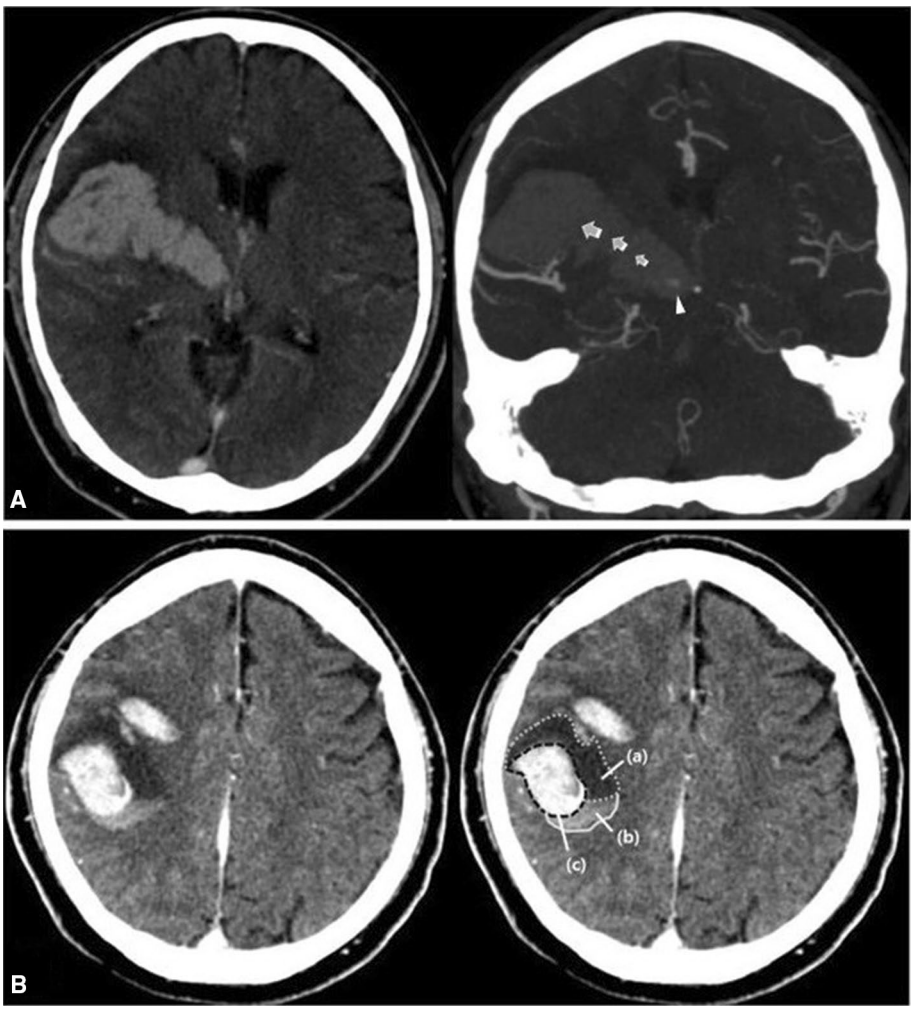

Fig. 1 Brain computed tomography (CT) and angiography at the first visit. (**A**) Intracerebral hemorrhage (ICH) is present in the right frontotemporal lobe with a spot sign (arrowhead). (**B**) Axial enhanced CT shows different densities, which indicate cerebrospinal fluid (a), abscess (b), and hemorrhage (c)

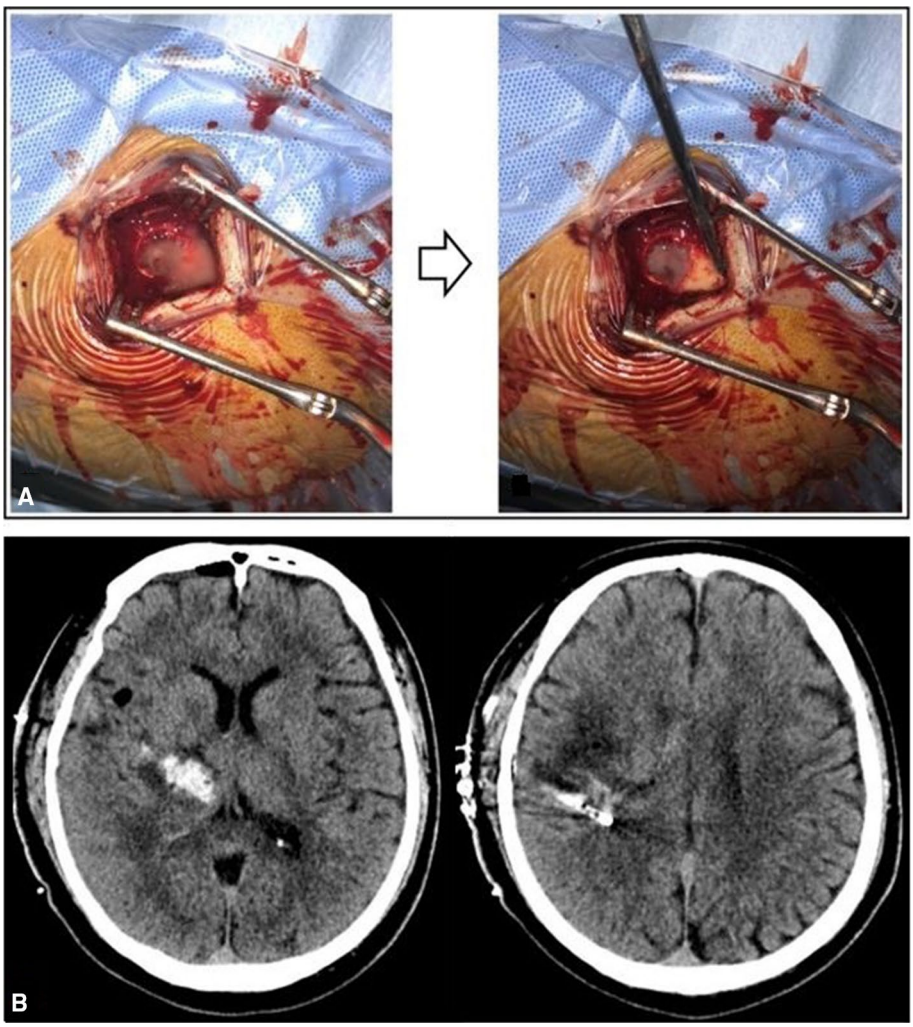

Fig. 2 **a** Cruciate incision of the dura was made, and white-colored purulent material was drained. Massive irrigation and suction were performed. **b** Postoperatively, the fluid level disappeared on CT and the ICH-induced mass effect had nearly resolved

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None.

Author contributions
EJY and HGK designed this study. SWH and HGK collected and analyzed the raw clinical data. EJY and HGK performed the computational studies and wrote the manuscript. All authors have read and approved the final manuscript for publication.

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Conflict of interest
The authors declare that they have no conflicts of interest.

Ethical approval and Informed consent
Informed consent was obtained from all individual participants included in the study, including full permission for the publication, and reproduction of photographs from the patient.

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