

Case Report

Brain abscess rupturing into the ventricle

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Abstract: A 64-year-old man was transferred to our hospital with high fever and headache after treated in the local hospital for 50 days. Cerebrospinal fluid (CSF) test revealed methicillin-resistant staphylococcus aureus (MRSA) infection in local institution. Magnetic resonance (MR) imaging showed a cyst on left temporal lobe. With continuous antibacterial therapy, the intrinsic symptoms fell away, but he was lethargic with right hemiplegia and quickly fell into superficial coma. And MR image showed the lesion communicated with left ventricle. We performed decompressive craniotomy with intraventricular drainage and excised the abscess. The patient successfully discharged 2 weeks after operation and computed tomography (CT) scan showed total abscess resection. Such a brain abscess rupturing into ventricle was rare, typical and could be fatal as a result of ventriculitis. We suggest an early surgery after mature abscess wall was formed.

Keywords: Brain abscess, ventriculitis, intraventricular rupture, MRSA

Introduction

Brain abscess is a neurosurgical emergency accounting for 2% of intracranial mass [1]. Brain abscess rupturing into ventricle could be fatal as a result of ventriculitis. Its reported frequency is 0-31% [2-5]. And the mortality of intraventricular rupture is more than 80% [2, 4]. We report a patient with temporal lobe abscess rupturing into the ventricle, which were treated with administration of antibiotics and emergent surgery, resulting in favorable outcome.

Case report

A 64-year-old man was admitted to our hospital from local institution after having high fever (highest at 39.7°C) and headache for 50 days with progressive unconsciousness for 3 days.

In local institution, laboratory examinations revealed elevated leukocyte ($13.6 \times 10^9/L$) and serum procalcitonin level (0.66 ng/ml). CSF examination demonstrated there is an increase in protein (1.3 g/L) and amount of

cells ($840 \times 10^6/L$), decrease in glucose (1.1 mmol/L) and chloride (80 mmol/L). In addition, methicillin-resistant staphylococcus aureus (MRSA) was isolated from the CSF. MR image of Head showed a cyst on his left temporal lobe (**Figure 1**).

With continuous therapy using vancomycin (1000 mg per 12 hours) in local hospital, the intrinsic symptoms was milder, but he was lethargic with right hemiplegia. Surprisingly, MR image and CT showed the primary lesion ruptured into the left ventricle (**Figures 2 and 3**).

Seeking a better treatment, the patient was transferred to our hospital and shortly after that he fell into superficial coma with left asthenocoria. We performed decompressive craniotomy with catheter drainage in left lateral ventricle and the abscess was excision during which the CSF test was negative. After 2 weeks' post-operative treatment and rehabilitation training, the patient successfully discharged with level 3 of muscle strength of his right limbs and the post-surgery CT scan confirmed total removal of the lesion (**Figure 4**).

Intraventricular rupture of brain abscess

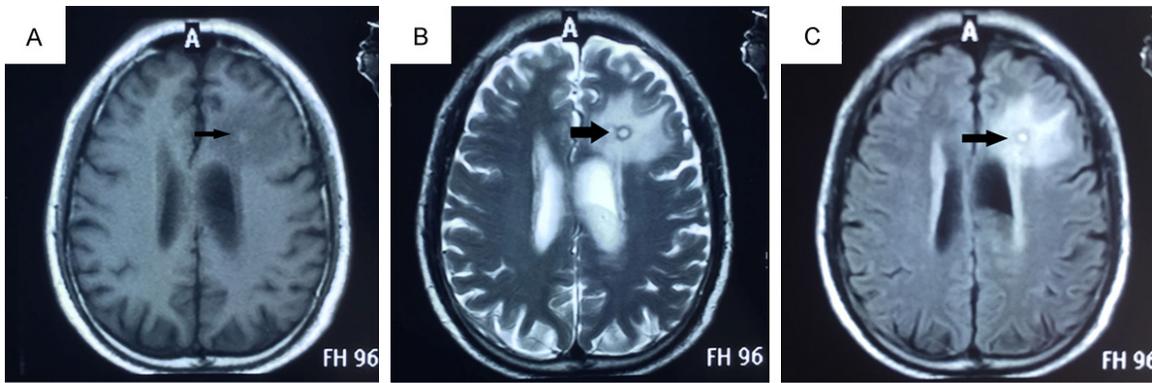


Figure 1. Axial T_1 -weighted MR image (A) shows a hyper-intense lesion on his left temporal lobe (arrow), with surrounding hypo-intense shadow, ventricular enlargement, and median shifting to the right. Axial T2-weighted MR image (B) shows the hyper-intense lesion has a hypo-intense annular wall (arrow) with hyper-intense area around it. Axial fluid-attenuated inversion recovery MR image reveals hyper-intense area around ventricle. Fluid attenuated inversion recovery MR image (C) shows a hyper-intense lesion with surrounding hyper-intense area.

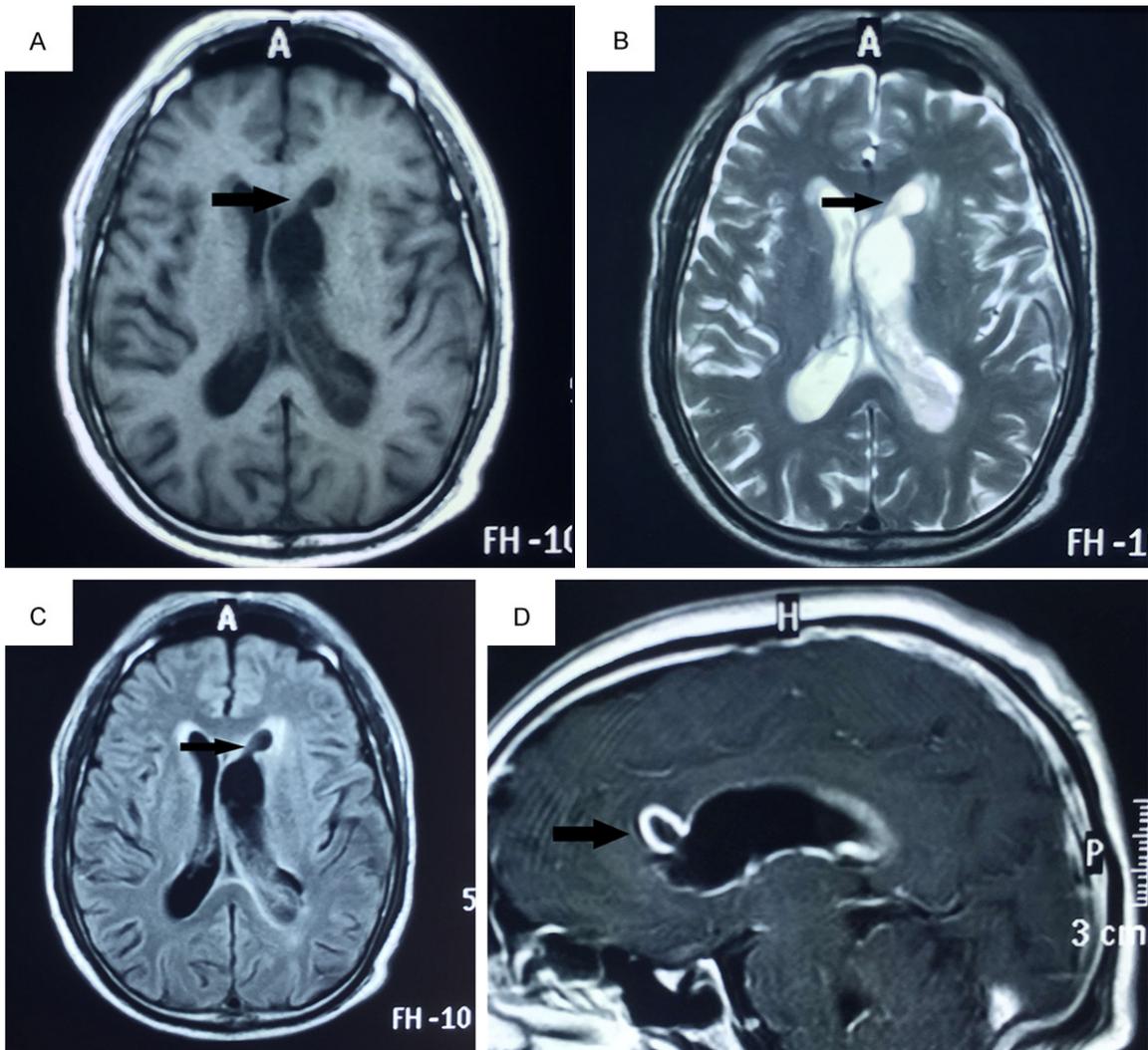


Figure 2. Axial T_1 -weighted MR image (A-C) shows communication (arrow) between original lesion and left lateral ventricle. Contrast enhanced T_1 -weighted sagittal MR image (D) shows primary lesion (arrow) rupture into left ventricle with obvious enhanced wall.

Intraventricular rupture of brain abscess

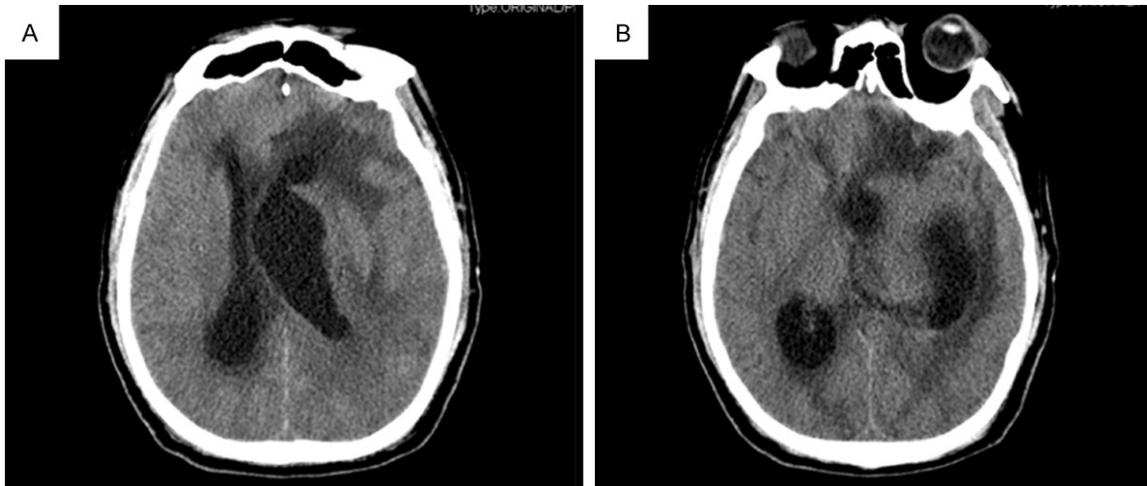


Figure 3. CT scan (A and B) before surgery shows communication between lesion of left temporal lobe and left lateral ventricle. And middle line shifted to the right with enlargement and distortion of the ventricle.

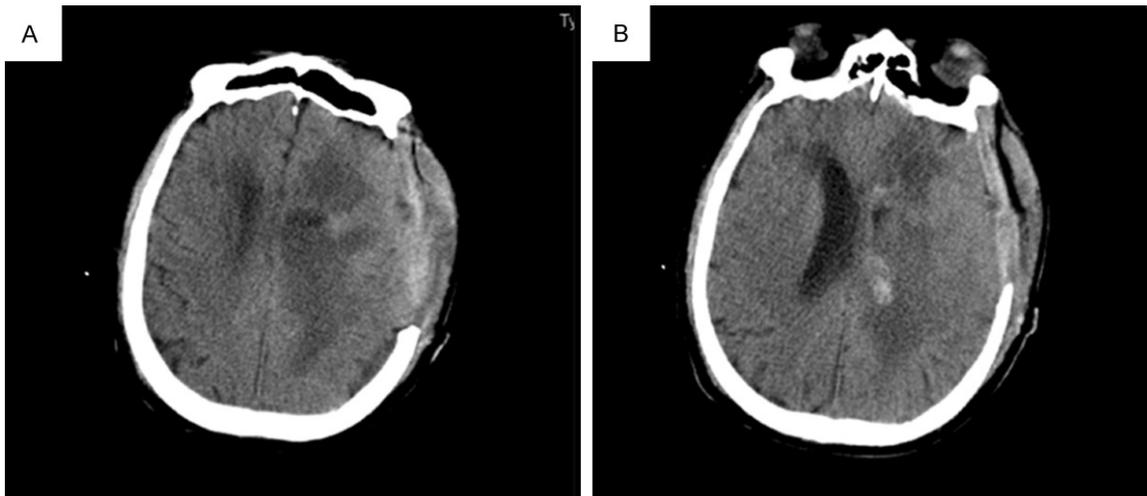


Figure 4. CT scan (A and B) 14 days after surgery showed total removal of the lesion. Middle line structure moved back to normal, and shape of the ventricle gradually returned to normal.

Discussion

Early diagnosis of intraventricular rupture is vital. The mortality of intraventricular rupture is more than 80% [2, 4]. With appropriately using of antibiotic on the basis of CSF test and timely surgery, the prognosis of our patient is good.

Patients receiving previous antibiotic therapy are more likely not suffered from clinical progression. But after rupture of the abscess, outcome is certainly different. For this reason, the presence of brain abscess close to the ventricular system indicates immediate intervention to prevent rupture [6]. Negative CSF test of our patient during the surgery benefited from anti-

biotic therapy because the abscess was very likely sterile.

Intraventricular rupture of the abscess can cause inflammation such as meningoencephalitis including fatal ventriculitis and lead to the increased intracranial pressure and extensive encephaledema [7]. And that could attribute to sudden progression of symptoms such as coma like our patient. In this situation, immediate surgery is very important.

For our patient, he had consciousness disorder and MR image showed a wide range of encephaledema and intraventricular rupture of abscess, so we thought decompressive crani-

Intraventricular rupture of brain abscess

Table 1. Summary of similar case report

Reference	Nation	Year	Age	Location	Therapy besides antibiotics	Outcome
McKalip et al. [8]	USA	1996	53	Left frontal lobe	Ventriculostomy	Mild cognitive deficits
Oshiro et al. [6]	Japan	2003	71	Right parietal lobe	Ventricular drainage	Dead
Engh et al. [9]	USA	2008	49	Left occipital lobe	Ventricular drainage	Right hemianopia
Nishizaki et al. [10]	Japan	2011	69	Left occipital lobe	Evacuation by neuroendoscope	Recovery
Inamasu et al. [11]	japan	2011	48	Right frontal lobe	Ventriculostomy	Severe cognitive deficits
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otomy with drainage was necessary. Although there is a risk of spread of infection, such procedure can control increased intracranial pressure by hydrocephalus and encephaledema, remove the pus and abscess debris [7].

Despite advanced medical research, a standard treatment for intracranial abscess has not yet been established. There are few case reports about intraventricular rupture of the brain abscess, but the treatment methods were different and the outcomes were not always acceptable (**Table 1**). We suggest an early surgery after mature abscess wall was formed. Further research, including intraventricular irrigation, upgrading of antibiotic and using of endoscopic technique may bring better results.

Disclosure of conflict of interest

None.

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