



Case Report

Intracranial mycotic aneurysm rupture following cupping therapy

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ABSTRACT

Background: Cupping therapy is an alternative treatment that uses a small glass cup to suck the skin with a needle and has been used to manage skin problems and pain. However, serious complications have been reported. Herein, we describe a case of intracranial mycotic aneurysm rupture after cupping therapy.

Case Description: A 25-year-old male patient presented with a headache and fever after cupping therapy for atopic dermatitis. He was diagnosed with infective endocarditis, and antibiotic therapy was initiated. After that, he suddenly lost consciousness, and head imaging revealed a cerebral hemorrhage due to a ruptured intracranial mycotic aneurysm. He underwent craniotomy, which was successful, and he was transferred to a rehabilitation center with a modified Rankin scale score of 2 at three months post-stroke.

Conclusion: This case serves as a reminder of life-threatening infectious complication risks after cupping therapy. A patient who has a compromised skin barrier may experience serious adverse effects, especially when cupping is performed without implementing suitable infection prevention measures.

Keywords: Aneurysm rupture, Atopic dermatitis, Cerebral hemorrhage, Cupping therapy, Infective endocarditis, Mycotic aneurysm

INTRODUCTION

Cupping therapy is a traditional treatment method that uses a small round cup made of thick glass to suck the skin; when a needle is used, it is known as wet cupping. Cupping therapy is widely used as an alternative intervention in East Asian and Middle Eastern countries.^[4,7] It is believed to remove trapped toxins, improve circulation, and transfer discomfort or morbidity from one area to another, with or without a needle. While it is claimed to cure discomfort in the index problem area, it also exerts a placebo effect and has a psychological effect. Although some authors have proposed that cupping therapy may have curative mechanisms, their existence remains unconfirmed. Meanwhile, wet cupping therapy has been linked to serious infectious complications, including the development of necrotizing fasciitis.^[1] Although few reports exist on stroke onset following cupping therapy,^[6,3,13] none have documented cases of ruptured intracranial mycotic aneurysms (ICMAs). Herein, we report a case of infective endocarditis

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(IE) and ICMA rupture after wet cupping therapy. Written informed consent was obtained from the patient for the publication of this report.

CASE DESCRIPTION

The patient was a 25-year-old male presenting with atopic dermatitis, and wet cupping therapy was performed without disinfection to treat atopic dermatitis. Three days later, he developed a fever in the 40°C range and persistent headache. He was admitted to another hospital where meningitis was suspected, and ceftriaxone (6 g/d) was initiated. Blood cultures were positive for methicillin-sensitive *Staphylococcus aureus*, and echocardiography revealed vegetation at the mitral valve, with mild mitral regurgitation. He also developed hypoesthesia in the left lower limb, and magnetic resonance imaging showed multiple bilateral acute cerebral infarcts [Figures 1a and b]. Twenty-two days after cupping therapy, he suddenly experienced a loss of consciousness and was transferred to our hospital. Computed tomography revealed an intracerebral hemorrhage in the left frontal lobe [Figure 1c], and computed tomography angiography demonstrated an aneurysm in the distal middle cerebral artery, which was

determined to be the source of the hemorrhage [Figures 1d and e]. The patient underwent an urgent craniotomy to trap the aneurysm and remove the hematoma. The pathological findings suggested a ruptured ICMA [Figures 2a and b]. After surgery, he had persistent right hemiplegia and aphasia; however, his level of consciousness improved. After that, the mild mitral regurgitation was exacerbated by vegetation, and mitral valvuloplasty was performed 33 days after surgery. Three months after stroke onset, the patient was transferred to a rehabilitation hospital with a modified Rankin scale score of 2.

DISCUSSION

No previous reports have described cupping therapy-induced ruptured ICMA. Given the experience of this patient, we strongly suggest raising public awareness of the infection risks of traditional therapies, such as cupping therapy, and ensuring hygiene standards are enforced at all facilities.

Cupping therapy can be classified into two main types: Dry and wet (*Hijama*). Dry cupping therapy uses cups to create negative pressure on the skin through suction, whereas

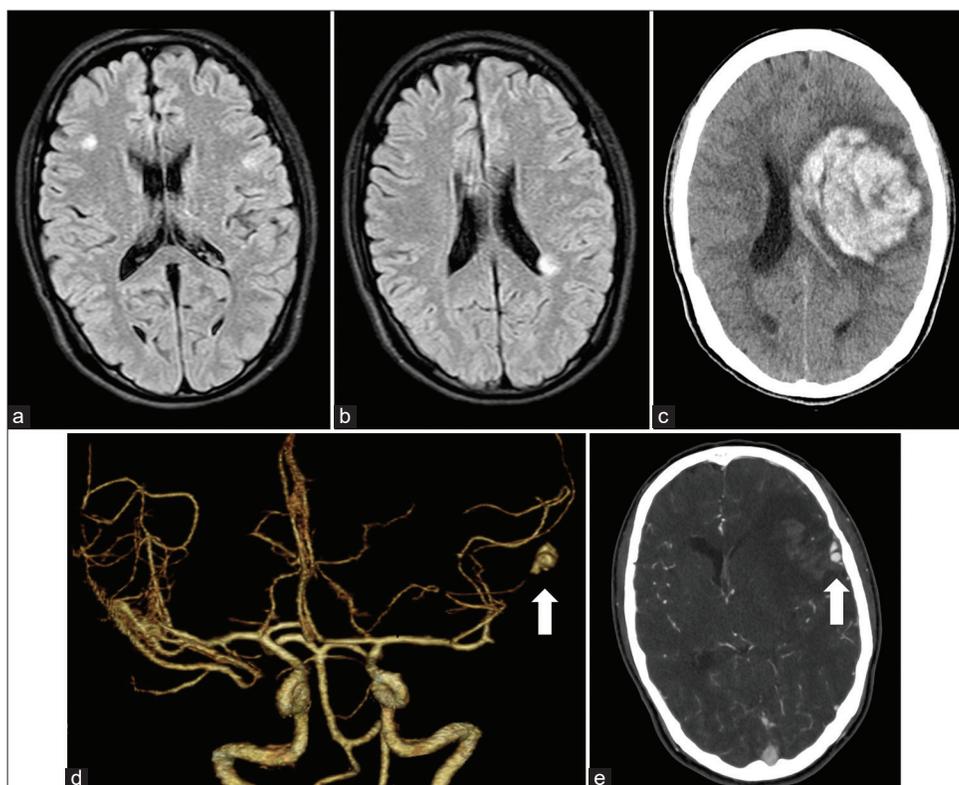


Figure 1: (a and b) Magnetic resonance imaging revealing acute cerebral infarction in the right frontal lobe near the left lateral ventricle. (c) Computed tomography revealed an intracerebral hemorrhage in the left frontal lobe. (d) A three-dimensional computed tomography angiography image showing an aneurysm in the distal middle cerebral artery (white arrow). (e) Axial computed tomography reveals bleeding from the aneurysm (white arrow).

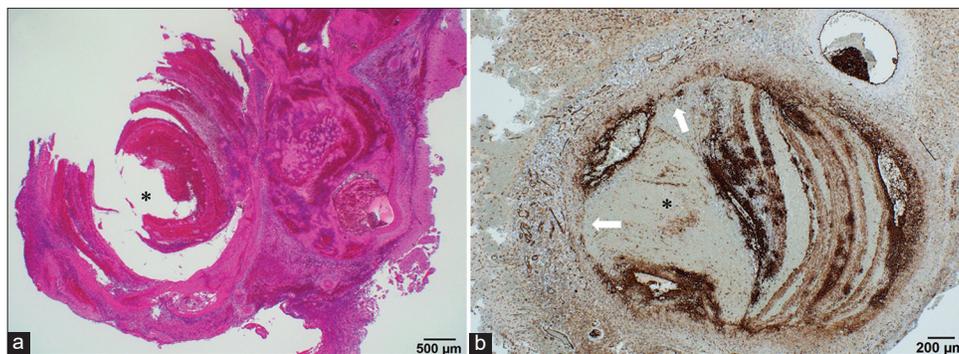


Figure 2: (a) Hematoxylin and eosin staining revealed inflammatory cell infiltration, with partial disruption of the aneurysm wall. The endothelium is obscured, and there is neutrophilic infiltration with a hemorrhage. The asterisk indicates the intra-aneurysmal lumen. (b) Elastica van Gieson staining shows a loss of the internal elastic lamina (white arrows). The asterisk indicates the intra-aneurysmal lumen.

wet cupping therapy is relatively invasive and involves scarification with needles or surgical blades before cupping therapy, such that blood is drawn into the cup. In this case, the patient had been suffering from atopic dermatitis for many years, and wet cupping was performed in unhygienic conditions. Although cupping therapy is sometimes used in patients with atopic dermatitis, its efficacy has not been confirmed.^[9] In addition, complications such as iliopsoas abscess,^[12] necrotizing fasciitis,^[11] and septic arthritis^[8] have been linked with wet cupping therapy. To prevent these complications, cupping therapy should be administered by knowledgeable individuals in a specialized facility or hospital where infection control and prevention measures are rigorously applied.

Cupping therapy has been reported to cause cerebrovascular diseases, including intracerebral hemorrhage, extracranial vertebral artery dissection, and cervical artery dissection.^[6,3,13] These outcomes have been linked to the discomfort caused by the procedure and sudden changes in blood pressure due to stimulation of the carotid sinus baroreceptors. However, in this case, no abnormal findings were observed in the cervical vessels, including the vertebral artery. Furthermore, since the aneurysm rupture occurred several days after the cupping therapy, the sudden rise in blood pressure is unlikely to have been the cause. Rather, it is believed that unhygienic cupping therapy caused the infection and may have led to the formation of IE and the ICMA rupture after that.

IE is a systemic septic disease with various clinical sequelae caused by vegetation in the valves and endocardium. Neurological complications are the most severe extracardiac complications and occur in 15–20% of patients with IE, with ICMA being relatively rare, accounting for <10% of IE neurological complications.^[12] The study reported that ICMA rupture generally occurs in the early phase of IE. As

small aneurysms tend to rupture,^[10] the observed early-phase rupture could have been linked to a recently formed small aneurysm. In fact, in this patient, a relatively small aneurysm rupture had occurred four days after the diagnosis of IE, consistent with the chronology of similar case reports.

In patients with atopic dermatitis, more than 90% of skin lesions show colony formation by *S. aureus* due to an inadequate expression of antibacterial, antifungal, and antiviral peptides that are otherwise induced by inflammation.^[2] The scratching of pruritic skin lesions can easily lead to the development of *S. aureus* infections, including bacteremia and endocarditis.^[5] Regarding the relevance of IE and atopic dermatitis, patients with atopic dermatitis who developed IE tend to be younger than those with general IE, and 90% of the causative pathogens have been reported as *S. aureus*.^[11] In this patient, blood culture results also showed methicillin-susceptible *S. aureus*, which suggests that bacteria may have entered percutaneously during cupping therapy.

CONCLUSION

We report a case of a patient with an intracranial hemorrhage due to the rupture of an ICMA after cupping therapy. Cupping therapy should be performed at facilities that follow hospital-grade disinfection protocols. Patients should be followed up post-treatment to ensure good outcomes.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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