Complications of hydrogen peroxide irrigation have been described in the literature and typically involve the remote effects of O₂ emboli. We present the first report of a local complication from hydrogen peroxide irrigation performed to cleanse an infected craniotomy wound.

This 40-year-old man underwent a left craniotomy to remove a large subdural hematoma. Surgery was uneventful. Two weeks later, however, the patient developed erythema and swelling of the craniotomy incision with malodorous drainage. On the 1st hospital day, the wound was partially opened and gently irrigated with 5 ml of a 3% hydrogen peroxide solution. The same procedure was repeated on the 2nd hospital day. Immediately following irrigation, the patient lost consciousness and experienced respiratory arrest. He was resuscitated, and an emergency computerized tomography (CT) scan was obtained, revealing a large amount of intracranial and intracerebral pneumocephalus causing severe mass effect (Fig. 1 left). The patient was transported to the operating room where the intracranial O₂ was evacuated and the bone plate was removed (Fig. 1 right).

Liberated O₂ from hydrogen peroxide irrigation mechanically removes wound contaminants, kills bacteria and viruses, and causes vasoconstriction, thus facilitating hemostasis. One milliliter hydrogen peroxide produces 10 ml O₂. This rapid volume expansion is the basis for complications related to its use. For example, a case of posterior fossa pneumocephalus has been reported following hydrogen peroxide irrigation of an infected lumbar wound due to intrathecal gas accumulation.

In our case, after hydrogen peroxide irrigation, the expanding gas volume became trapped intracranially when the dura and bone plate acted together as a one-way valve system. The result was instantaneous elevation of intracranial pressure.

Although hydrogen peroxide irrigation has been routinely performed with excellent results, it should not be used without certain technical precautions. In fact, its use should be strictly limited to clearly open wounds for which no possibility of gas entrapment can occur. In the event of entrapment, facilities for emergency imaging studies and potential surgical intervention must be immediately available.

References