A Case Report of Successful Conservative Treatment for Huge Acute Traumatic Intracerebral Hematoma

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Abstract: Acute traumatic intracerebral hematoma (ICH) is a common intracranial injury after trauma. Surgery is preferred if the volume of supratentorial hematoma is >30 mL and complicated with disturbance of consciousness or other neurofunction impairment. When supratentorial hematoma is >50 mL, patients can rarely survive if only treated with medicine. Here we present a successful case of conservative treatment for an elderly female patient with acute traumatic ICH of about 80 mL. The patient was admitted to the emergency department, with a complaint of conscious disturbance for half a month after occipital injury. A diagnosis of left prefrontal lobe cerebral contusion complicated with ICH was made after computed tomography (CT) scan. She was then treated with mannitol and dexamethasone, which were reduced stepwise and finally stopped 80 days after injury when CT scan was performed and showed mild left prefrontal lobe cerebral contusion (Fig. 1). She was admitted and treated conservatively. Four hours after injury, the patient experienced fluctuating impairment of consciousness. The CT scan of the head showed left prefrontal hematoma of about 80 mL (Fig. 2). Consciousness of the patient aggravated progressively and she was in coma 72 hours after injury. The patient was conservatively supported until 15 days after the injury, and then she was transferred to our hospital for further treatment.

INTRODUCTION

Acute traumatic intracerebral hematoma (ICH) is always complicated with high morbidity and mortality. Surgical operation is prior management when the hematoma expanded progressively or produced obvious space-occupying effect. It is generally believed that urgent operation should be performed in the following circumstances: the supratentorial hematoma is >30 mL, the midline shifted >10 mm, the basal cistern was compressed, and intracranial pressure (ICP) was obviously increased. However, here we would like to report a successful case of conservative treatment for an elderly female with ICH of about 80 mL.

CLINICAL FINDINGS, INTERVENTIONS AND OUTCOME

An 80-year-old woman was admitted to the emergency department with a complaint of conscious disturbance. Half a month ago, she lost consciousness after an occipital injury of her head and woke up 3 to 5 minutes later. Then she was immediately sent to the local hospital, where a computed tomography (CT) scan was performed and showed mild left prefrontal lobe cerebral contusion (Fig. 1). She was admitted and treated conservatively. Four hours after injury, the patient experienced fluctuating impairment of consciousness. The CT scan of the head showed left prefrontal hematoma of about 80 mL (Fig. 2). Consciousness of the patient aggravated progressively and she was in coma 72 hours after injury. The patient was conservatively supported until 15 days after the injury, and then she was transferred to our hospital for further treatment.

Neurological examination revealed coma, aphasia, and neck stiffness upon her admission. The patient presented right hemiplegia, wherein the Babinski sign was positive and the muscle was hypertonic. CT scan discovered edema surrounding the hematoma and evident midline shift, while the rest of brain tissue was compressed significantly (Fig. 3). At the beginning of treatment, 125 mL of mannitol was given intravenously every 8 hours and 5 mg of dexamethasone was reduced stepwise and stopped on the 15th day of the treatment. The absorption of hematoma and cerebral edema was monitored with CT scans. Mannitol was slowly reduced to 100 mL every 12 hours and then discontinued 80 days after injury when CT scan found that the hematoma and surrounding edema were significantly absorbed (Fig. 4). The conscious state of the patient also remarkably improved. Subsequently, she was transferred to the local hospital for rehabilitation.

The case study was approved by the Ethics Committee of the Second Affiliated Hospital, Xi’an Jiaotong University, Xi’an, China. In addition, written informed consent was obtained from the patient before data collection.

DISCUSSION

Acute traumatic ICH is a common disease after brain trauma with high morbidity and mortality due to fast progress, particularly in older patients with large volume of hemorrhage or brainstem involvement. Surgery is often carried out due to...
progressive expansion of hematoma and remarkable space-occupying effect.\textsuperscript{1} There is rare report demonstrating successful conservative treatment for acute traumatic ICH of >50 mL. However, here we report a successful case of conservative treatment for an elderly female with a hematoma of about 80 mL. Previously, the International Surgical Trial in Intracerebral Haemorrhage-2 (STICH-2) randomized controlled trial recruited 601 patients with supratentorial ICH and indicated that early hematoma evacuation within 12 hours was not superior to initial conservative treatment in terms of morbidity and mortality rate.\textsuperscript{3} However, another meta-analysis including STICH-2 revealed opposite results regardless of significant heterogeneity.\textsuperscript{4} ICH score of the patient in our case was 3 (0–6), which showed obscure risk and prognosis of surgery.\textsuperscript{5} Moreover, the frontal lobe location of the hematoma, nonintra-ventricular and brainstem extension, and the cerebral atrophy of the patient may all delay the increasing ICP induced by ICH in our case. Therefore, we believe conservative treatment was more preferable.

Mannitol has been used to reduce acutely raised ICP as osmotherapy in clinics for long time. It was demonstrated that administration of mannitol on 6 patients with midline shift resulted in significant reduction of brain volume at 50 to 55 mL.\textsuperscript{6} However, conflicting result from an earlier study on large hemispheric infarction indicated that mannitol aggravated the midline shift and deteriorated the neurological function.\textsuperscript{7} Although mannitol did not seem to be beneficial in patients with ICH in many studies later,\textsuperscript{8–10} it was found that preadministration of mannitol before infusion of human bone marrow stromal cells (hBMSCs) can significantly increase the number of hBMSCs in the ICH region, promote neural regeneration, and reduce pathological impairment of ICH.\textsuperscript{11} So it has been accepted that mannitol could be used in patients with large ICH and increased ICP in the presence of clinical signs of impending rostrocaudal deterioration.\textsuperscript{12} But mannitol is usually maintained for no more than 5 days to avoid side effects such as fluid and electrolyte imbalance, pulmonary edema, and renal failure.\textsuperscript{13} In the current case, CT scans revealed that the hematoma absorption was slow whereas the ICP was at a high level continuously. Therefore, mannitol was reduced stepwise during a much longer period of treatment, which may be useful for neurofunction rehabilitation. To be noticed, in the period of mannitol use, renal function and serum electrolyte of the patient was closely monitored.

The role of steroids in acute ICH has been debated over the last century.\textsuperscript{14} Currently, the trial of high-dose deferoxamine in ICH is underway to follow-up a phase I trial, which indicated that deferoxamine mesylate of 62 mg/kg/d may play neuroprotective roles, alleviate perihematoma edema and neuronal damage, and promote functional recovery without serious

**FIGURE 1.** One hour after brain injury, cerebral contusion with subarachnoid hemorrhage was noticed in the left frontal lobe without obvious hematoma.

**FIGURE 2.** Four hours after brain injury, intracerebral hematoma of about 80 mL was located in the left frontal lobe with obvious space-occupying effect.
adverse effects or increased mortality. In addition, glucocorticoids were supposed to be more beneficial for fetus and children. Prenatal glucocorticoids intervention could prevent intraventricular hemorrhage most effectively by enhancing the stability of the germinal matrix vasculature and reducing the fluctuation of cerebral blood circulation. Treatment for children with β-methasone hemisuccinate, a novel formulation of liposome-encapsulated water-soluble glucocorticoid prodrugs, led to lower levels of cerebral inflammation and diminished hemorrhage and edema. The initial dose of dexamethasone applied to this patient was 10 mg, and it was reduced gradually and continuously for 15 days. As a result, brain edema of the patient was well controlled, while no severe side effects, such as femoral head necrosis and hyperglycemia, were noticed.

CONCLUSION

In summary, our report may help to accumulate more experience on the conservative treatment for elderly patients with acute large ICH. Due to the high morbidity and mortality of ICH, surgical operation is usually preferred. But for older patients with larger volume of acute hemorrhages and poor prognosis, conservative treatment might be a choice. However, prospective trials are still needed to evaluate the conservative treatment on ICH in the future.

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