Cerebral Hyperperfusion Syndrome is it an Underlying Complication of Ventriculoperitoneal Shunt: a Case Report

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Abstract

Objective: Cerebral Hyperperfusion Syndrome (CHS) is a rare complication that most reported after carotid endarterectomy, which to be an underlying complication of ventriculoperitoneal shunt (V-P shunt) theoretically, has not been reported yet. Here we report a case that had clinical and radiological proof of CHS after V-P shunt.

Methods: We reviewed clinical progress and imagings’s of this patient in detail and consult some relevant literatures. Then we put forward a novel hypothesis that a potential but rare complication occurs after V-P shunt, which we provide relevant information to confirm.

Results: The recorded clinical progress and imaging’s of the case highly supports the hypothesis that the patient experienced cerebral hyperperfusion after the V-P shunt.

Conclusion: Physicians must be aware of CHS that a rare but potentially fatal complication following V-P shunt.

Keywords: Ventriculoperitoneal shunt; Epilepsy; Cerebral hyperperfusion syndrome

Case Presentation

A 63-year-old woman was admitted January 2018 for progressive mental deterioration and trouble walking within 3 months. Her medical history includes resection of left frontal lobe grade III glioma, the surgery presented in March 2003. In July 2004, she was diagnosed hydrocephalus and then went on ventriculoperitoneal shunt (V-P shunt); the tube was placed in the right lateral ventricle (Figure 1A). Both two surgeries did not process in our hospital. During the past 14 years, the patient irregularly went to our hospital for brain magnetic resonance imaging (MRI) scan, MRI showed no significant changes on the size of bilateral ventricles and no recurrence of glioma. She basically had the ability to independently carry out daily activities before this admission. Now she was admitted to our hospital for progressive mental deterioration and trouble walking.

On physical examining, she was moving slowly, had correct verbal answer, sat in a wheelchair and could not walk independently, Glasgow Coma Scale (GCS) scored 15. Brain MRI showed bilateral ventricles enlargement compared to the previous imaging’s the reservoir of the right shunt was considered out of work so we decided to implement V-P shunt once again in another side of the ventricle. The preoperative pressure of lumbar puncture was 80 mm H2O. The patient went on left V-P shunt on Jan. 8, 2018, but was found confusion soon after the surgery, her GCS score deteriorated to 10 (E3V2M5), which was not improved using low dose methylprednisolone. Her Systolic Blood Pressure (sBP) monitored between 154 mmHg to 198 mmHg compared to 120 mmHg to 162 mmHg preoperatively. On postoperative day 6 (POD 6), the patient began to have paroxysmal right hand and face twitch, seizures stopped after using diazepam. Brain CT and MRI showed no intracranial hemorrhage (Figure 1B) or fresh cerebral infarction (Figure 1C). Treatment with levetiracetam and valproate was initiated, but seizures still had not been fully controlled. In the next few days, she was experienced five or six seizures daily and GCS score declined to 8 (E2V1M5). After we added clonazepam and carbamazepine to treat her on POD19, the patient had no recurrence of seizures, but still in a coma state, GCS scored 7 (E1V1M5). At POD47, we found a large hematoma beside the left occipital horn by reexamining brain CT (Figure 1H). Laboratory studies showed normal coagulation function. The patient then received conservative treatment and discharged. After three months follow-up, we reduced the antiepileptic drugs for the patient, and she had no recurrence of epilepsy, but was still confused.

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Impaired cerebral autoregulation and hypertension are said to be may develop a generalized tonic-clonic attack if not treated properly. with focal seizures in the contralateral of the surgical site, they reported an uncommon complication of CHS and occurs in less than 1% of patients [8]. Patients with epilepsy after CHS initially present deficits, seizures are the primary clinical manifestations. et al. [5] postoperative headache, altered mental status, neurological appeared a series of symptoms of CHS. We believe that for patient with poor basic condition and complex intracranial situation, it is better to determine the intracranial hemodynamics before the shunt operation, or to recognize the possibility of CHS once seizure occurred after the surgery by closely monitoring blood pressure and for evidence of hyperperfusion, then effective treatments can be implemented and later improve patients' prognosis. Postoperative BP control is fundamental in the prevention and management of CHS [7].

Limitations
We did not consider the problem of CHS during the treatment, so it is regrettable that we do not detect intracerebral blood flow of the patient by using TCD or CTP.

Conclusion
Here we report a patient experienced cerebral hyperperfusion syndrome after V-P shunt. The recorded clinical progress and
imaging’s of the case highly supports the hypothesis that the patient experienced cerebral hyperperfusion after the V-P shunt. Early recognition and medical intervention of CHS are extremely important, because the prognosis gets worse once intracerebral hemorrhage happen. Physicians must be aware of this rare but potentially fatal complication following V-P shunt in patients with poor basic condition and complex intracranial situation.

Acknowledgement

1. We would like to acknowledge the patient’s relative that kindly agreed to sign the informed consent.

2. This study was supported by National Natural Science Foundation of China (81701152).

References


