

POST STROKE HYDROCEPHALUS: A CASE REPORT

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ABSTRACT

Hydrocephalus in case of hemorrhagic stroke with intraventricular extension is common complication, but without intraventricular extension is rare. However, we rarely find hydrocephalus following resolved hemorrhagic stroke. We present a case of communicating hydrocephalus in 65 year female who presented with left sided weakness, disoriented and loss of consciousness since few weeks. Patient was managed with ventriculoperitoneal (VP) shunt. We report this unusual case with pertinent literature.

KEY WORDS

Hydrocephalus, Hypertension, Stroke, VP Shunts



INTRODUCTION

Intracerebral hemorrhage (ICH) is one of stroke type with high mortality.¹ One of common complication after ICH is acute hydrocephalus which generally evolves as a result of intraventricular extension of hematoma resulting in IVH and impairment of CSF drainage and reabsorption.² There are some studies that reported that hydrocephalus is predictor of poor prognosis following ICH.³ Diversion of CSF by external ventricular drain (EVD) is the only standard treatment for acute hydrocephalus in patient with ICH in whom IVH presents. Persistent communicating hydrocephalus may develop after acute flow obstruction even though intraventricular hemorrhage (IVH) / ICH resolution. It may necessitate the placement of a Ventriculoperitoneal (VP) Shunt for permanent CSF diversion. The studies on hydrocephalus after ICH/IVH are rare.⁴ This case report records a rare complication of persistent communicating hydrocephalus after ICH without ventricular extension.

CASE PRESENTATION

A 59 year old female presented in emergency department with history of headache, dizziness, disoriented, progressive weakness of all limbs (L>R) along with loss of consciousness. Patient had history of hypertension under medication since 5 years and right basal ganglia hemorrhage 2 years ago (Figure. 1). NCCT head was done and CT scan showed resolved hemorrhage with dilated all lateral and third ventricles (Figure 2). Right Frazier's point, ventriculoperitoneal (VP) shunt was performed. Patient improved in GCS as well as in power as compared to previous surgery at the time of discharge. She was discharged after 9 days of VP shunt placement.



Figure 1: Axial CT scan which showed right basal ganglia hemorrhage

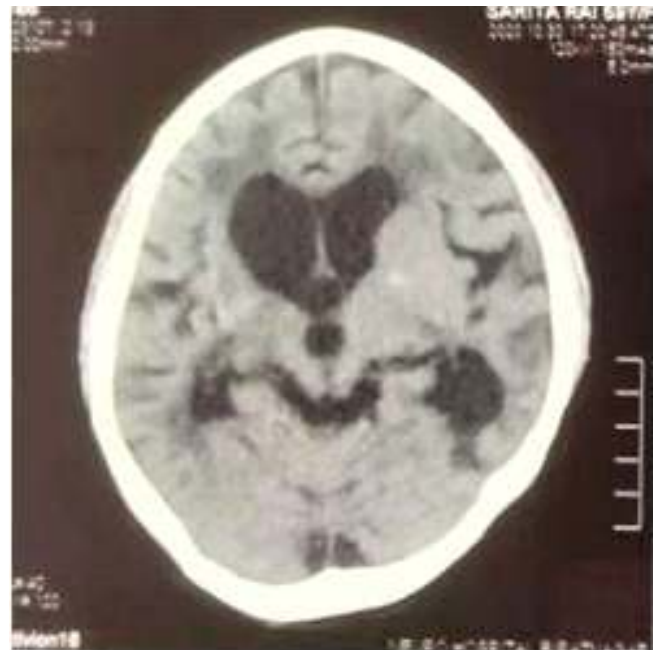


Figure 2: Axial CT scan which showed resolved hemorrhage and grossly dilated ventricles.

DISCUSSION

Stroke is also one of leading causes of death which is caused by the occlusion or rupture of cerebral blood vessels. Stroke can be ischemic, hemorrhagic or both. Ischemic stroke is more frequently caused by occlusion of artery, but sometimes it may be caused by occlusion of veins or sinus. Hemorrhagic stroke is the consequences of bleeding from a ruptured cerebral artery or from bleeding in to the site of an acute ischemic stroke (AIS).⁵ Hypertension is one of the most common factor which causes spontaneous intracerebral hemorrhage with amyloid angiopathy, arteriovenous malformation, cerebral cavernous malformation, arteriovenous fistula, aneurysm and brain tumor.⁶ Stroke accounts for 10-15% of all stroke in USA, Europe and Australia, 20-30% in Asia, with about 2 million cases per year worldwide.⁷ Most common location of intracerebral hemorrhage are ganglionic (putamen, caudate and thalamus), followed by lobar, cerebellar.⁸

Intraventricular hemorrhage following ICH may develop Hydrocephalus. A study done by, Bhattathiri and colleagues has shown that positive outcome is decreased from 15.1 to 11.5% because of hydrocephalus in sub analysis of the STITCH trial.⁶ The incidence of hydrocephalus after ICH was rarely discussed. Rong hu et al reported that hydrocephalus occurred 8.9% of patient after ICH, 22% of patients with IVH secondary to ICH.⁹ The diagnosis of hydrocephalus in this study was based on patient's clinical and imaging data. Earlier obstructive hydrocephalus may be associated with hematoma mass effect / IVH or both secondary to ICH, which prevent normal CSF flow.⁴ Hydrocephalus following ICH may develop in two-third of patients mainly within 2-3days. Nevertheless, time frame for communicating hydrocephalus due to traumatic brain injury and/or subarachnoid hemorrhage is from 2 weeks to 1month.¹⁰

Shunt dependent hydrocephalus has been defined as symptoms of hydrocephalus (decreased mental status) with persistent elevated ICP, or radiological enlarged ventricles, requiring placement of a VP shunt for permanent CSF diversion. Brad et al reported that persistent increased in ICP was associated with an increased risk of shunt dependent hydrocephalus.¹¹ The control of ICH with medicine and surgery may not improve or reduce the risk of chronic hydrocephalus, although increased ICP is predictor for poor prognosis following ICH.² Thalamic hemorrhage to third ventricle and foramen of monro or compressing to cerebral aqueduct more easily results in CSF flow obstruction leading to hydrocephalus even though by small ganglionic hemorrhage rarely impact on ventricle size. Ventriculitis, surgical complication, edema due to mass, recurrent ICH or fibrosis of ventricle may also relate to chronic hydrocephalus. Despite the fact that IVH is known to predict worse outcome in patient with volume dependent ICH, development of shunt dependent hydrocephalus was more likely in those patients with thalamic hemorrhage but independent of other location or IVH volume.¹² Some studies described that development of hydrocephalus in case of thalamic cavernoma and hemorrhage without intraventricular extension.^{13,14} Chen Q et al described that

persistent brain iron accumulation in intracerebral hematoma which precipitated for development of hydrocephalus after ICH.⁴ Our study reported a case of thalamic hemorrhage which was associated with shunt dependent hydrocephalus which was managed by VP shunt. The pathological process for formation of hydrocephalus after thalamic hemorrhage is unclear and worthy to investigate further investigation.

CONCLUSION

Thalamic location of an ICH and Continually elevated ICP may alert neurospecialist. More aggressive monitoring and earlier intervention for continually progression of acute to chronic shunt dependent hydrocephalus remains standard treatment. Our results, in correlation with previous study, provide reference point on which to base further inquired and measure the potential benefits of more aggressive management for diseases at risk patient with ICH.

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CONFLICT OF INTERESTS

There is no conflict of interests

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