

Idiopathic Primary Intraventricular Hemorrhage with Normal CT Angiography in a Young Adult: A Case Report

Dr Binay Kumar Singh¹, Dr Abhinav Sagar², Dr Himaal³,
Dr Sohan Bhataniya⁴

¹Professor and Head of Department, Department of Internal Medicine, ESI PGIMS and Model Hospital, Basaidarapur, New Delhi, India

^{2,3,4}Postgraduate Student (MD Medicine), Department of Internal Medicine, ESI PGIMS and Model Hospital, Basaidarapur, New Delhi, India

Abstract

Primary intraventricular hemorrhage is an uncommon subtype of intracranial bleeding and is rarely seen in young adults [1]. It is defined as hemorrhage confined exclusively to the ventricular system without associated intraparenchymal involvement [2]. A 22-year-old male presented with sudden onset headache and visual disturbances and was diagnosed with isolated intraventricular hemorrhage involving the lateral, third, and fourth ventricles. Extensive etiological evaluation, including computed tomography angiography, did not reveal any vascular or structural abnormality, leading to the diagnosis of idiopathic primary intraventricular hemorrhage. The patient was managed conservatively and achieved complete clinical recovery. This case emphasizes the importance of thorough diagnostic evaluation and highlights the favorable prognosis of idiopathic primary intraventricular hemorrhage in young individuals [3].

Keywords: Primary Intraventricular Hemorrhage, Young Adult, Idiopathic, CT Angiography, Vertical Gaze Palsy

Introduction

Primary intraventricular hemorrhage is characterized by bleeding limited to the ventricular system without involvement of the surrounding brain parenchyma and accounts for a small proportion of all intracerebral hemorrhages [1]. In young adults, this condition is rare and is most often associated with secondary causes such as vascular malformations, aneurysms, trauma, neoplasms, or coagulation abnormalities [3]. When no cause is identified despite comprehensive evaluation, the hemorrhage is termed idiopathic. Early diagnosis and systematic exclusion of secondary etiologies are essential for appropriate management and prognostication.

Case Presentation

A 22-year-old male presented with sudden onset severe headache accompanied by diplopia and visual disturbances. There was no history of trauma, hypertension, substance abuse, anticoagulant or antiplatelet drug use, or bleeding diathesis. There was no significant past medical history.

On examination, the patient was conscious, alert, and oriented. Vital parameters were within normal limits. Neurological examination revealed vertical gaze palsy with associated nystagmus. Motor strength, sensory examination, cerebellar function, and remaining cranial nerve examination were normal. There were no clinical features suggestive of raised intracranial pressure.

Investigations

Non-contrast computed tomography of the brain demonstrated hyperdense blood within both lateral ventricles with extension into the third and fourth ventricles. No intraparenchymal hemorrhage, cerebral edema, infarction, or hydrocephalus was observed [5]. Basal ganglia, thalami, and posterior fossa structures were normal.

Fundoscopy examination did not reveal papilledema. Routine laboratory investigations, including complete blood count, renal and liver function tests, and coagulation profile, were within normal limits. Computed tomography angiography of the brain and neck did not demonstrate any aneurysm, arteriovenous malformation, Moyamoya disease, or other vascular abnormality.

Management

The patient was managed conservatively with head elevation, adequate analgesia, antiemetics, and close neurological monitoring. Nimodipine was administered empirically [6]. There were no features of raised intracranial pressure or hydrocephalus, and cerebrospinal fluid diversion was not required. The patient remained clinically stable throughout the hospital stay.

Outcome and Follow-Up

Gradual clinical improvement was observed during hospitalization. Headache and diplopia resolved progressively, with marked improvement in vertical gaze palsy and nystagmus. The patient was discharged in stable condition with advice for regular neurological follow-up. No residual neurological deficit was present at discharge.

Discussion

Primary intraventricular hemorrhage in young adults is an uncommon clinical entity [2]. Secondary causes such as vascular malformations, aneurysms, neoplasms, and coagulation disorders must be excluded before labeling a case as idiopathic [4]. In the present case, normal computed tomography angiography ruled out major vascular etiologies and supported the diagnosis of idiopathic primary intraventricular hemorrhage.

Intraventricular blood involving the third ventricle and cerebral aqueduct may result in dorsal midbrain dysfunction, explaining the occurrence of vertical gaze palsy [2]. Compared with intraparenchymal hemorrhage, isolated primary intraventricular hemorrhage generally carries a favorable prognosis, particularly in young patients without hydrocephalus or raised intracranial pressure [3]. Conservative management with close monitoring is often sufficient and associated with excellent outcomes.

Conclusion

Idiopathic primary intraventricular hemorrhage is a rare diagnosis in young adults and should be considered only after exclusion of secondary causes. Normal computed tomography angiography strengthens the diagnosis. Early identification and conservative management can result in complete neur-

ological recovery and favorable outcomes.

Ethical Approval

Ethical approval was not required for this case report.

Informed Consent

Written informed consent was obtained from the patient.

References

1. Halleivi H., Albright K.C., Aronowski J., et al., Intraventricular hemorrhage: Anatomic relationships and clinical implications, *Neurology*, 2008, 70 (11), 848–852.
2. Darby D.G., Donnan G.A., Saling M.M., Walsh K.W., Primary intraventricular hemorrhage: Clinical and neuropsychological findings in a prospective stroke series, *Neurology*, 1988, 38 (1), 68–75.
3. Woo D., Broderick J.P., Spontaneous intraventricular hemorrhage: Clinical features and outcome, *Stroke*, 2002, 33 (1), 38–42.
4. Nieuwkamp D.J., de Gans K., Rinkel G.J.E., Algra A., Treatment and outcome of severe intraventricular hemorrhage in adults: A systematic review, *Journal of Neurology*, 2000, 247 (2), 117–121.
5. Graeb D.A., Robertson W.D., Lapointe J.S., Nugent R.A., Harrison P.B., Computed tomographic diagnosis of intraventricular hemorrhage: Etiology and prognosis, *Radiology*, 1982, 143 (1), 91–96.
6. Steiner T., Juvela S., Unterberg A., Jung C., Forsting M., Rinkel G., European Stroke Organization guidelines for the management of intracerebral hemorrhage, *International Journal of Stroke*, 2014, 9 (7), 840–855.