

**Case Report****Recurrent Hemorrhagic Stroke in Bilateral Basal Ganglia: A Comprehensive Case Report of Sequential Events**

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Hemorrhagic strokes typically occur unilaterally, often in individuals with a history of hypertension. Bilateral recurrent hemorrhagic strokes are exceedingly rare and present significant clinical challenges in patient management. This case report discusses a patient with recurrent hemorrhagic strokes in the bilateral basal ganglia, detailing the clinical course and management strategies. A 58-year-old male with a five-year history of hypertension presented with complaints of a headache lasting three days and generalized weakness accompanied by difficulty walking due to right-sided hemiparesis. Imaging revealed a left basal ganglia bleed. Within a year, he experienced a similar episode with left-sided hemiplegia, and imaging confirmed a new hemorrhage in the right basal ganglia. Recurrent hemorrhagic stroke underscores the necessity for effective blood pressure control through antihypertensive medications and lifestyle modifications, as well as vigilant patient monitoring to mitigate the future risk of such events, ensuring long-term prognosis and quality of life. In brief, this study examines a particular medical case involving recurrent hemorrhagic strokes in both sides of the brain's basal ganglia. It provides a thorough analysis of the sequence of these hemorrhagic events, detailing their characteristics and exploring the possible underlying causes and treatment strategies.

**Keywords:** Basal ganglia, Hypertension, Intracerebral hemorrhage, Recurrent stroke**Introduction**

Hemorrhagic strokes constitute approximately 10-15% of all stroke cases, with the basal ganglia being the most common site [1]. Unilateral hemorrhagic strokes are well-documented as being precipitated by hypertension, a significant risk factor. However, recurrent hemorrhagic strokes involving both sides of basal ganglia at different episodes are extremely rare and present significant clinical challenges due to their potential for severe neurological deficits.

Managing such cases requires more than immediate treatment protocols; they necessitate long-term strategies to prevent recurrence. In the present case, here we report a 58-year-old right-handed gentleman, known to have hypertension for the past five years and under medication, who presented with recurrent hemorrhagic strokes in both basal ganglia in two different episodes. This case emphasizes the importance of managing hypertension in both acute and long-term settings to prevent further severe complications and

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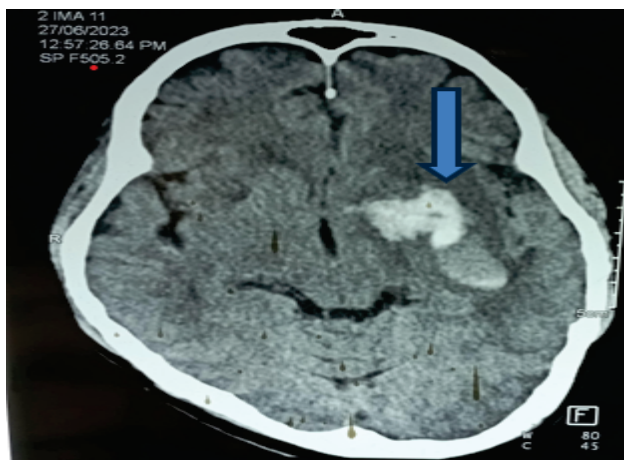


improve patient outcomes.

### Case Presentation

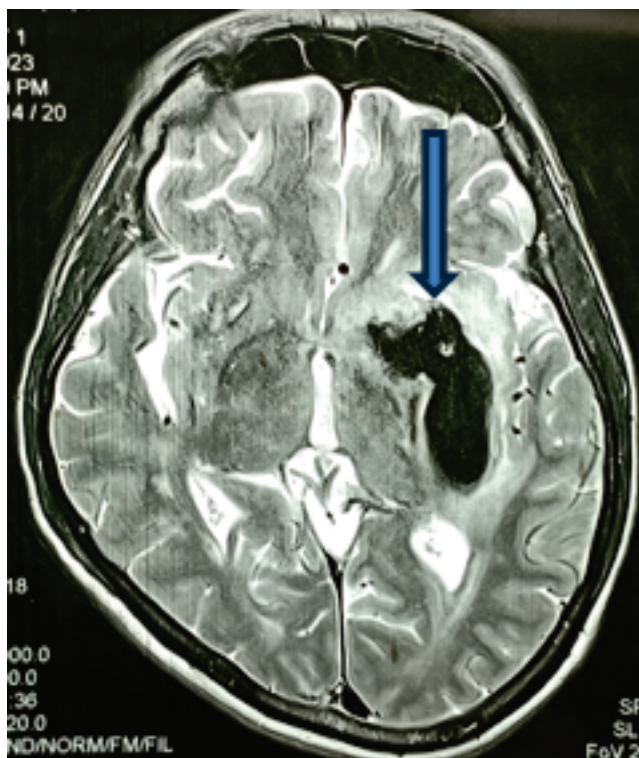
A 58-year-old male presented to our emergency department (ED) for the first time in the year 28th June, 2023 with complaints of headache of three days associated with sudden onset right sided weakness associated with global headache and vomiting. The ictus had occurred 3 days prior to arrival at the hospital. He was unable to stand and walk due to weakness on the right half of the body. There was no history of loss of consciousness, vomiting or seizures. He has had a known case of hypertension for the last five years and has been taking Amlodipine 5 mg once daily since then. He does not consume alcohol nor smoke. He chews local tobacco. He takes a mixed diet consisting of wheat, rice, fish, mutton and eggs. He did not give a history of hypertension and other familial diseases running in his family. He does not give the history of allergy to any known substance. On presentation in ED, he was restless. He was not following commands. He was infertile, his presenting blood pressure was 160/96 mmHg taken in supine position in ED on the red zone area on his right arm. His pulse was 120 beats per minute, normovolemic in character. He was mildly tachypneic with a respiratory rate of 26 breaths per minute. His GCS was E3V1M5(9/15). Pupils were bilaterally 2 mm round regular reactive to light. There was right sided hemiplegia with motor aphasia and facial asymmetry suggesting facial palsy. Because of low GCS, other cranial nerves were not examined in detail.

A Computed Tomography (CT) scan of the head was immediately performed in ED, which revealed a left basal ganglia bleed with mass effect as shown in Figure 1.



**Figure 1: CT head showing Left basal ganglia bleed with mass effect as shown by arrow head**

Magnetic Resonance Imaging (MRI) with MR tractography of the same patient was performed which showed an acute left basal ganglia hematoma, as well as microhemorrhages in the right basal ganglia, left thalamus, and left parietal lobe, as shown in Figure 2, with disturbed corticospinal continuity.

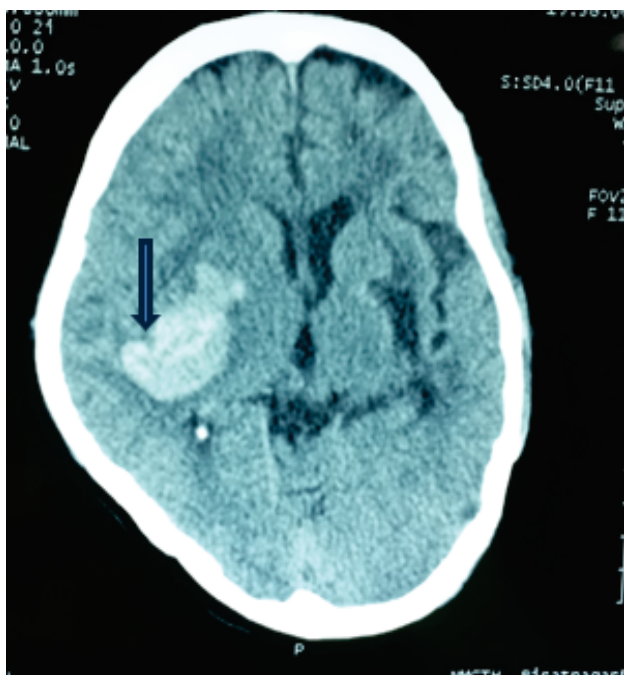


**Figure 2: MRI Brain showing acute left basal ganglia hematoma by arrow head, as well as microhemorrhages in the right basal ganglia, left thalamus, and left parietal lobe. His blood pressure was under control with 2 anti-hypertensive (Amlodipine 5 mg and Losartan 25 mg once a day).**

The patient was managed with standard AHA guidelines protocol [2] in neurosurgery ICU with standard nursing care for 3 days and shifted to neurorehabilitation ward and extensive rehabilitation care was given. Patient started standing with support and did a cycling test in the rehabilitation ward after 25 days of vigorous exercise. He was discharged home with medications and continuations of physiotherapy of limbs and was followed after 4 weeks of discharge. On follow up he presented with spastic right sided limbs; however, he was able to stand with support. Later after 6 months of follow up, he presented in OPD without support with GCS of 15/15 and right sided minimal weakness (MRC Grade 4/5 on both right upper and lower limbs). But to his tragic story, the same patient presented on 23rd february, 2024 before 1 year of first stroke in ED, where the



family visitors give history of sudden onset loss of consciousness associated with history of one episode of abnormal body movements which was tonic clonic in nature as per the family member who had observed the ictus. Family visitors give a history of poor compliance to antihypertensive medication also he had left medicine for the last 6 days. On examination he was drowsy, blood pressure was 170/90 mm Hg. His GCS was E3V4M6(13/15). He had left upper and lower limb weakness (2/5). He was immediately resuscitated and the CT head was done which revealed a large bleed with minimal mass effect on the right basal ganglia region as shown in the Figure 3.



**Figure 3: CT scan head showing Right basal ganglia bleed with mass effect as shown by arrow head (On second Insult)**

The patient was again managed in Neurosurgery ICU with standard care as before. The repeat CT head was done after 24 hours of ictus which showed no change in hematoma volume and mass effect. The GCS of the patient improved after 72 hours of ICU care and shifted in neurorehabilitation and he was cared for as previous and discharged home with the same neurological status as he presented but with improved GCS. On follow up, he was able to walk without support and presented himself for the follow up at 3 months.

The outcome of this patient implies that there is still a good neurological recovery even in some selected basal ganglia bleeds even when the insult is on bilateral motor highway.

## Discussion

Non-traumatic intracerebral hemorrhage (ICH) involves bleeding into the brain parenchyma, which may extend into the ventricles and, in rare cases, the subarachnoid space [1]. Advancing age and hypertension are the most significant risk factors for ICH, which occurs more frequently in men [1]. The primary cause of ICH is sustained hypertension, leading to pathophysiological changes in small arteries and arterioles [1]. Other factors include cerebral amyloid angiopathy, ruptured aneurysms, coagulation disorders, use of anticoagulants and thrombolytics, hemorrhage into cerebral infarcts, bleeding into brain tumors, and drug abuse [1, 3]. The hemorrhage often spreads along white-matter planes, causing minimal destruction and preserving neural tissue around the hematoma. Rupture of small penetrating arteries from basilar or cerebral arteries results in intracerebral hemorrhage [1]. ICH typically presents with sudden onset of a focal neurological deficit that progresses over minutes to hours, accompanied by headache, nausea, vomiting, decreased consciousness, and elevated blood pressure [3].

Ongoing bleeding and hematoma enlargement during the initial hours can lead to early neurological deterioration [3] due to increased intracranial pressure and direct compression or distortion of critical brain structures. Although hypertensive ICH is usually a single event, neuropathological studies indicate a recurrence rate of up to 14% [4] often at different sites than the initial hemorrhage due to damage in weakened vessels [1, 4]. Factors contributing to brain edema after ICH include hematoma expansion, mass effect, necrotic brain tissue, disruption of the blood-brain barrier, release of thrombin, clot retraction, complement activation, and erythrocyte lysis [5]. Studies show high morbidity and mortality rates in patients with spontaneous ICH, with most survivors becoming disabled and dependent on care. Independent predictors of severe disability or death within three months include poor functional status prior to ICH, larger hematoma volume, infratentorial bleed location, low Glasgow Coma Scale score on admission, intraventricular hemorrhage, and persistently high blood pressure [6].

Intensive blood pressure management has been associated with better functional and psychological outcomes in patients with ICH, although it may not significantly reduce the primary outcome of death or major disability [7]. There has been a similar study by Neupane et.al in patients of concurrent bilateral basal ganglia bleed. The



patient was managed conservatively according to standard ICU care protocol and was discharged with significant recovery on follow ups [8].

Similarly another case with spontaneous bilateral basal ganglia hemorrhage due to severe hypertension was too managed conservatively in neurosurgery ICU with significant clinical improvement [9].

### Conclusion

This case report presents a patient with recurrent hemorrhagic strokes in the bilateral basal ganglia with a history of hypertension. It discusses the etiology, management, and outcomes of such patients, highlighting the importance of long-term hypertension management to prevent further complications and improve patient prognosis. This case reflects that one of the preventive measures for recurrent stroke is regular uninterrupted medication for controlling the high blood pressure.

**Patient Consent:** Informed consent was obtained.

**Acknowledgement:** I would like par huge respect for patient who is involved in the present case report.

**Conflict of interest:** None

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