

**Case report****Concurrent Eloquent Area Bleeds in a Patient with Uncontrolled Hypertension**

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**Abstract**


Uncontrolled hypertension being the most important risk factor for intracerebral hemorrhage (ICH) often leads to solitary hematoma whereas multiple spontaneous simultaneous ICH is not common, and occurrence of bilateral hemorrhage is a rare entity with normal bleeding parameters with very few case reports so far. Here, we report a 67-year-old man with a past medical history of uncontrolled hypertension who was brought to the emergency department due to severe headache, worsening confusion for 1 day. An urgent non-contrast brain Computed Tomography (CT) performed immediately revealed bilateral intracerebral hemorrhage (ICH) of the same age in the right putamen and left thalamus. Our patient had a non-traumatic ICH, with low GCS (5/15) at presentation. He was managed conservatively with antihypertensives and antiedema measures. He was discharged in stable condition GCS 14/15 with left hemiparesis (3/5). At last follow up he was recovering well. Due to the rarity of spontaneous intracranial bleed in patient with normal bleeding parameters, it is particularly interesting to report this rare case presentation.

**Keywords:** *Hypertension, Intracerebral hemorrhage*

**Introduction**

The “basal ganglia” is a group of sub cortical nuclei functioning primarily motor control, as well as other roles such as motor learning, executive functions and behaviors, and emotions [1]. These nuclei are from the forebrain (telencephalon and diencephalon) and mesencephalon. The sub-thalamic nucleus, substantia nigra, caudate nucleus, the putamen, ventral striatum and the globus pallidus are included in the forebrain. The sub-thalamic nucleus is located below the

thalamus [2]. The white matters present in between the basal nuclei contain ascending and descending fibers from the cerebral cortex. The basal ganglia and the internal capsule are supplied by perforating branches of anterior cerebral artery, middle cerebral artery, internal carotid artery, anterior choroidal artery and Heubner's artery. Some of the mentioned perforators vascularize both the internal capsule and basal nuclei, while some of them also perfuse the adjacent brain structures [3]. Intracerebral hemor-

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**Citation**

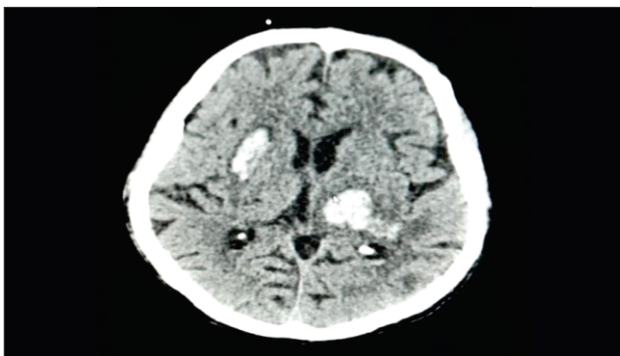
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rhage is the leading cause of all strokes and it accounts for 10-20% of all strokes [4]. Hypertension is the most important risk factor for ICH which accounts for 35-44% of hemorrhage in basal ganglia or thalamus. The occurrence of multiple simultaneous ICH has been observed in 2% of all hemorrhagic strokes, however, multiple simultaneous ICH due to hypertension is uncommon [5, 6, 7]. Simultaneous occurrence of hypertensive ICH in bilateral putaminal region appearing as mirror image (Owl eye appearance) has been rarely reported [8, 9, 10]. We report a case of simultaneous intracranial hematoma in the eloquent region with normal bleeding parameters.

### Case Report

A 67-year-old male was found unconscious in his room and was immediately brought up to our emergency room. He had been suffering from poorly controlled hypertension with irregular medication for 10 years. There was no any other significant medical history and history of substance abuse or trauma was clear. His blood pressure was 180/104 millimeter of mercury; he had the GCS (Glasgow Coma Scale) of 5/15, pupils were bilaterally equal and briskly reactive to light. Fundus examination revealed a grade 4 hypertensive changes. Laboratory blood works were performed including blood counts, bleeding and clotting time, PT, APTT, renal and liver function which all were within the normal range. A non-contrast CT imaging of brain was done which revealed bilateral hyperdense region contrasting right putaminal bleed with left thalamic bleed showing owl eye appearance (Figure 1). Patient was intubated and kept on mechanical ventilation and admitted to Neurosurgical Intensive Care Unit. He was treated with antihypertensives and antiedema measures. He was gradually weaned off the ventilator over two days and was extubated.



**Figure- 1: Computed Tomography (CT) scan of a 67-year-old male showing bleed in the right putamen and left thalamic bleed, the diameter was approximately 4.5 cm by 1.8 cm on right side and 3.8 cm by 3 cm on left side.**

His GCS improved to 14/15 and he had left hemiparesis (3/5), he needed support to walk and was tolerating normal diet. At last follow up he had significant recovery and was independent of activities of daily living.

### Discussion

Simultaneous bilateral intracranial hemorrhage (SBICH) due to hypertension is a rare entity and hypertension can cause recurrent ICH at same or different site [8, 11]. There have been reporting of causes for bilateral basal ganglia hemorrhages which are trauma, methanol poisoning, diabetic ketoacidosis, hyperglycemic hyperosmolar syndrome, migraine, lightning strike, anticoagulant use and fungal infection [12-18]. SBICH also can occur following hemorrhagic diathesis, cerebral amyloid angioplasty, vasculitis, sinus thrombosis, neoplasm, aneurysm, arteriovenous malformation, angioma and drug abuse [7]. We came to our diagnosis on the basis of long history of irregularly treated poorly controlled hypertension, hematoma on CT scan located on putamen which is the frequent location of hypertensive ICH and no other causative factor than hypertension.

The mechanism of SBICH remains uncertain. Hypertension impairs the vessel wall, leading to development of microaneurysms (Charcot-Bouchard aneurysms) of perforating arteries mainly the lenticulostriate and thalamoperforating arteries and their simultaneous rupture bilaterally causing SBICH. The initial unilateral hemorrhage causes distortion of vessels on the contralateral side and causes reflex increase in blood pressure leading to second hemorrhage [5, 9, 19]. Sorimachi et al [20] reported that the number of micro bleeds are significantly higher in the simultaneous multiple ICHs than in single ICH. Kono et al [21] found that occurrence of symmetrical hemorrhage is frequent than expected ratios of hemorrhage occurring randomly in terms of location, supporting the hypothesis of presence of symmetrically vulnerable vessels, leading to subsequent rupture than coincidental rupture and also the time lag of subsequent rupture can vary from few seconds to several hours.

SBICH carries a high morbidity and mortality rate as mentioned by earlier studies [7, 8, 9, 10, 13]. GCS at admission, hematoma distribution and total hematoma volume were important prognostic factors but hematoma size was also considered as prognostic factor in some studies [7, 22]. Poorer outcome is mainly due to destruction of crossing and non-crossing fibers, bilateral diaschisis phenomenon, severe disturbed consciousness, quadriparesis and pseudobulbar

palsy [19]. Unlike other reported cases, our patient achieved a relative good outcome (GOS-2) at the time of discharge.

### Conclusion

Simultaneous bilateral basal ganglia hemorrhage is unusual. Severe uncontrolled hypertension should be suspected in patient with normal bleeding parameters. In this case, we present a rare presentation of bilateral basal ganglia hemorrhage secondary to uncontrolled hypertension

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