

# CASE REPORT

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## Bilateral Simultaneous Hypertensive Intracerebral Hemorrhages in Both Thalami

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The recurrent intracerebral hemorrhage (ICH) in hypertensive patients is not an unusual event, but the simultaneous occurrence of multiple ICH is rare. A 70-year-old woman presented with bilateral simultaneous hypertensive intracerebral hemorrhages in both thalami. The complaints of the patient were unconsciousness (semicomatose mental state) and quadriplegia Grade II. The patient was managed conservatively. At discharge, the patient was awake (drowsy mental state), but Grade III according to the Glasgow Outcome Score. This paper reviews the clinical relevance, possible etiology, and treatment of bilateral thalamic ICH.

**KEY WORDS :** Simultaneous · Intracerebral hemorrhage · Hypertension · Bilateral · Thalamus.

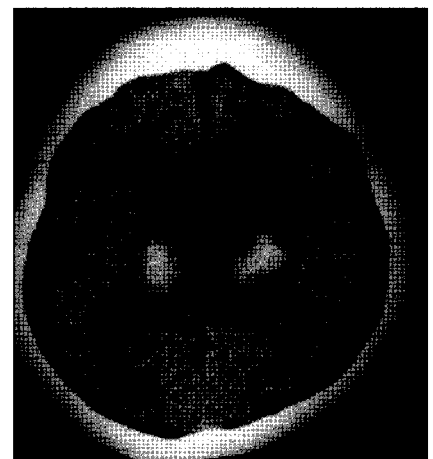
### Introduction

Spontaneous intracerebral hemorrhage (ICH) is the cause of 5 to 16% of all strokes in Europe and United States and between 20 to 35% of strokes in Asia<sup>12</sup>. In Korea, ICH in hypertensive patients is quite common, accounting for 32% of all strokes<sup>8</sup>. Recurrent ICH occurring at different times is not uncommon in patients with hypertension, but multiple simultaneous ICH is rare. To our knowledge, fewer than 30 cases of simultaneous bilateral ICH, demonstrated by computed tomography (CT), have been reported in the literature<sup>3-6,10,11,13-15,17</sup>.

### Case Report

A 70-year-old female was admitted to our hospital after being found unconscious in the toilet. The patient had been healthy before admission and the medical history was unremarkable except for a 5 years history of hypertension, which had been treated by intermittent medication. The blood pressure on admission was 210/130 mmHg. On admission, the patient was semicomatose with Glasgow Coma Scale score 7 (best eye opening : 2, best verbal : 1, and best motor : 4) and motor examination revealed quadriplegia Grade II. The pupils were equal and reactive to light. The initial brain CT obtained 2 hours after attack at the local hospital showed ICH on both thalami and intraventricular hemorrhage in left lateral ventricle

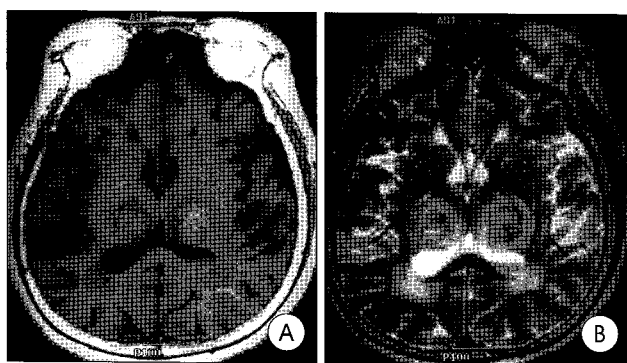
(Fig. 1). There were no signal void or other suspected abnormal lesion except bilateral acute hematoma on the brain MRI and MRA obtained 8 hours after attack (Fig. 2). The Brain MRI demonstrated bilateral thalamic hemorrhagic lesions with isointensity on T1WI and hyperintensity on T2WI. Both ICH showed same signals on T1WI and T2WI, suggesting simultaneous occurrence of both ICH. Surgical intervention was not attempted and conservative treatment was performed. One day after admission, ventilator was required due to shallow respiration. There was marked clinical improvement on the three days after admission. Three days later, the chest X-ray revealed pneumonia on the right middle lobe and the mental state deteriorated again. Six weeks after admission, the patient was able to be



**Fig. 1.** Brain computed tomography scan obtained two hours after attack showing the symmetric intracerebral hematomas in both thalamic regions penetrating to the left lateral ventricle.

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**Fig. 2.** Axial T1 – (A) and T2-weighted (B) brain magnetic resonance image obtained eight hours after attack demonstrating bilateral thalamic hemorrhagic lesions with isointensity on T1WI and hyperintensity on T2WI.

weaned from the respirator and referred to the local hospital. At discharge, the patient was awake and responsive, but Grade III according to the Glasgow Outcome Score.

## Discussion

The recurrent ICH in hypertensive patients is not an unusual event<sup>1,8</sup>, but the simultaneous occurrence of multiple ICH is rare. Weisberg reported that only two patients (0.3%) with multiple haematoma had a history of hypertension among 600 patients with CT evidence of spontaneous ICH<sup>17</sup>. Tanno et al. reported five cases (0.7%) of multiple simultaneous hypertensive ICH among 679 patient with hypertensive ICH<sup>14</sup>. According to the Freytag's report, 13 (3%) of 393 autopsies of patients with fatal hypertensive ICH was multiple hemorrhage<sup>2</sup>. With the increasing availability of radiological imaging studies, simultaneous multiple ICH has been reported more frequently.

There are several known causes of the simultaneous multiple hemorrhages, such as systemic arterial hypertension, hemorrhagic diathesis, cerebral amyloid angiopathy, vasculitis, sinus thrombosis, neoplasm, aneurysm, arteriovenous malformation, angioma, and drug abuse<sup>4,10</sup>. In this case, we could not find any causative disease except for hypertension and the hematomas were located in both thalami which are frequent location of hypertensive ICH. Generally accepted major mechanism of hypertensive ICH are an acute increase in flow (hemodynamic factor) and damage to penetrating blood vessels resulting from chronic arterial hypertension (premorbid condition). These vascular changes, referred to as lipohyalinosis or miliary aneurysm, were found on the contralateral to the hemorrhage in an autopsy study of patients with hypertensive ICH<sup>9</sup>. Two possible mechanisms for simultaneous bilateral ICH have been suspected : 1) the simultaneous rupture of bilateral vessels may occur incidently. 2) the initial hemorrhage can cause reflex increase in blood pressure and increased intracranial pressure, resulting in rupture of another vessel that is already weakened

by chronic arterial hypertension. Hickey et al. stressed that the degenerative process, caused by hypertension, is associated with the multiple ICH<sup>3</sup>. Even though the exact pathogenic mechanism is not clear, the vascular changes due to longstanding untreated hypertension is thought to be one of the major factor in simultaneous bilateral ICH.

The characteristics of patients with bilateral ICH are poor outcome and high mortality because of the severe neurological deficits, such as severe disturbance in consciousness, quadriplegia, and pseudobulbar palsy, even if the hematomas were not so large. The locations of the hematoma are well correlated to the distribution of common hypertensive ICH and the bilateral putamens and bilateral thalami are frequently involved.

There is controversy concerning the selection between operative and nonoperative treatment of spontaneous ICH and several factors should be considered such as the level of consciousness, size and location of hematoma, involvement of the dominant hemisphere, and deterioration of neurological status<sup>17</sup>. The hematoma volume and initial level of consciousness are valuable in predicting early outcome, and should therefore be evaluated in conjunction with the patient's neurological grade as well as hematoma location<sup>7</sup>. The goal of surgical treatment of spontaneous ICH is to reduce intracranial pressure produced by the mass rather than radical evacuation of clots and potentially secondary neuronal injury while minimizing further brain injury during evacuation. The majority of reported multiple ICH had been treated conservatively rather than surgery. The indication of operation is quite limited for bilateral supratentorial hematomas. Kabuto et al. restricted the surgical indication to patients who can be expected to have a good outcome after removal of the larger hematoma<sup>5</sup>. Some authors emphasized the surgical evacuation of the massive cerebellar hematoma in case of simultaneous supra- and infratentorial hypertensive ICH<sup>14,15</sup>. So the role of the surgical treatment should be evaluated closely in the future. Recently frame-based or frameless stereotactically placed catheter for subsequent fibrinolytic therapy with urokinase or recombinant tissue plasminogen activator (rt-PA) have been focused as an alternative to open craniotomy in patients with thalamic and putaminal hemorrhage<sup>7</sup>. Repeated injection of urokinase or rt-PA into the hematoma cavity was introduced to liquefy the clots chemically and to facilitate subsequent aspiration. Stereotactic aspiration could be an another modality of treatment in selected case of bilateral ICH.

## Conclusion

The longstanding untreated hypertension is the major cause of simultaneous bilateral ICH. The hematomas are usually located in the bilateral putamens and thalami. Poor

outcome and high mortality because of the severe neurological deficits, such as severe disturbance in consciousness, quadriplegia, and pseudobulbar palsy, are the common findings with bilateral ICH. The majority of reported multiple ICH had been treated conservatively rather than surgery. Even though the indication of operation is quite limited for bilateral supratentorial hematomas, stereotactic aspiration could be considered in selected case of bilateral ICH. So, the role of the surgical treatment in cases of bilateral intracerebral hemorrhages should be surveyed closely in the future.

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