

Brain Abscess from a Ganglionic Hemorrhage

—A case report—

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We present a unique case of a brain abscess that occurred secondary to a ganglionic hemorrhage in a 64-year-old man. This abscess appeared to be metastatic after septicemia. Aspiration with antibiotics eliminated this infection.

Key Words : Brain abscess, Intracerebral hemorrhage, Hypertension, Basal ganglia, Infection.

INTRODUCTION

After the introduction of the computerized tomographic(CT) scan, abscesses involving the basal ganglia became not uncommon. The incidence of ganglionic abscess has been reported from 3.7%-5.4% (Bhatia et al., 1986 ; Law et al., 1976). However, ganglionic abscess from a cerebral hemorrhage is extremely rare. Kurihara et al.(1989) had found only five cases of a brain abscess following intracerebral hemorrhage in the literature.

We recently experienced such a case in a 64-year-old man, and report here briefly.

CASE REPORT

This 64-year-old man came to the emergency room due to high fever and sudden comatose mentality on December 31, 1992. He had suffered a head injury from a motorcycle accident and had been admitted to a clinic on November 17, 1992. He was hemiplegic on the left side at that time. Computerized tomographic(CT) scans showed an intracerebral hematoma on the right putamen(Fig. 1,

upper, left). He remained alert and recovered day by day. Repeated CT scans with contrast on November 20 showed an early phase of resolution-(Fig. 1, upper, right). From November 24, spiking fever with generalized skin rashes were noticed. Urinalysis and plain chest x-rays were within normal limits. Repeated CT scans on November 27 showed unusually rapid homogenous resolution with strong ring enhancement(Fig. 1, middle). The lesion also increased in size. At first, some intravenous antibiotics (Amoxicillin, Lincomycin, and Cefazolin) were given consecutively, but the fever continued. No specific treatment for the brain abscess was given except use of antibiotics, despite the fact that repeated CT scans on December 16 clearly showed the characteristic features of a brain abscess(Fig. 1, lower). On December 31, his consciousness deteriorated rapidly, and he was transferred to our hospital.

On admission, he was comatose(6 points on the Glasgow Coma Score). Blood pressure was 140/90mm Hg, pulse rate 100/min, respiration rate 20/min, and body temperature 39.2°C. Moderate neck stiffness was noted. The right pupil was slightly larger(3mm) than the left one(2mm), but both were reactive to light. Horizontal nystagmus to the left was also noticed. Chest PA showed no pathologic findings. Laboratory studies revealed leukocytosis (WBC ; 15,000/mm³) and elevated ESR (46mm/hr). Intravenous antibiotics (Ceftriaxone

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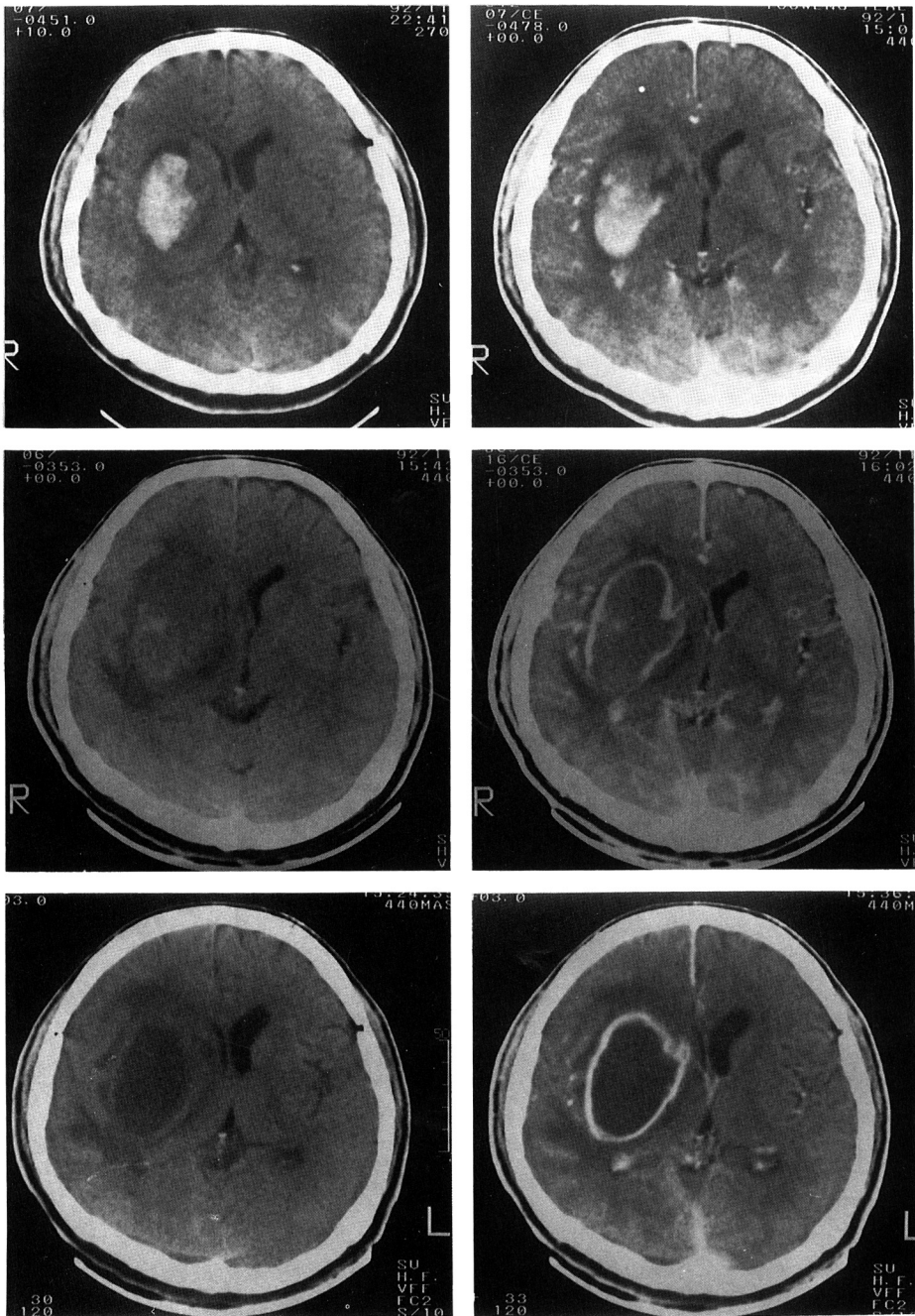


Fig. 1. Serial CT scans before aspiration. Upper left : an immediate CT scan after the motorcycle accident. Upper right : a contrast enhanced CT scan three days after head injury. Middle : pre-(left) and post-(right) enhanced CT scans three days after spiking fever. Lower : pre-(left) and post-(right)enhanced CT scans 19 days after spiking fever.

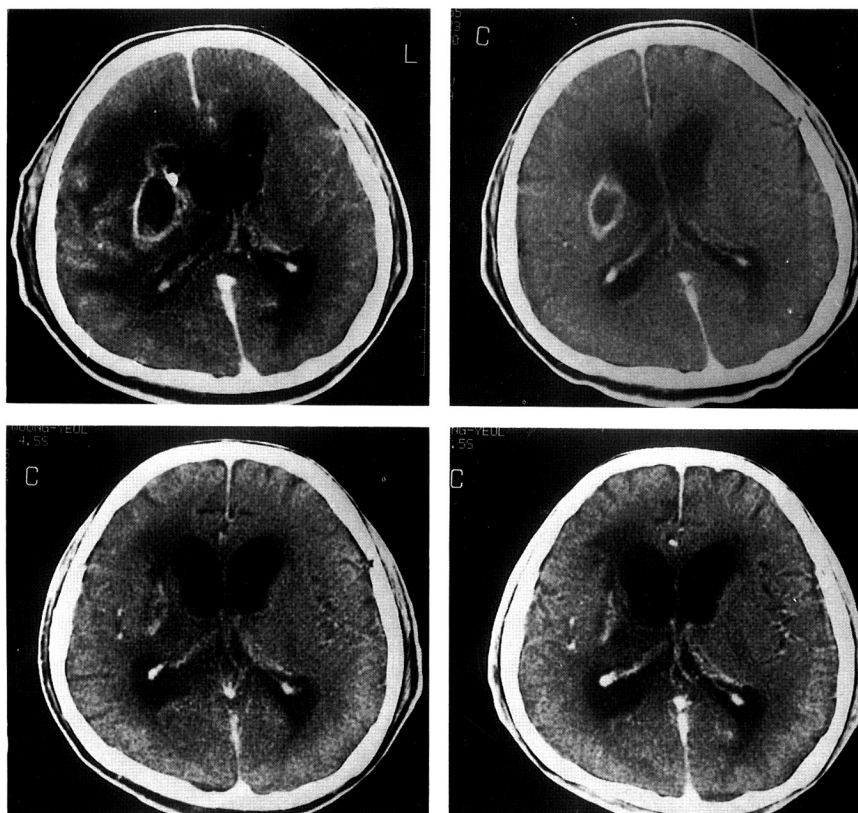


Fig. 2. Serial enhanced CT scans after aspiration. Upper left : after aspiration and external ventricular drainage. Upper right : 36 days after aspiration. Lower left : three months after aspiration. Lower right : 6 months after aspiration.

3g/day, Aztreonam 2g/day, and Chloramphenicol 3g/day, simultaneously) were given for more than three months. On January 1, 1993, a free-hand aspiration via right temporal burr hole was performed. About 20cc of yellowish brown colored pus was aspirated. Irrigation with saline and antibiotics via a silastic catheter was performed. No catheters were left in the abscess cavity. On the next day, his consciousness deteriorated again. Proximity of the abscess to the lateral ventricle and ependymal contrast enhancement in postoperative CT scan (Fig. 2, upper, left) suggested that extension of the infection to the ventricular system during aspiration and irrigation might be responsible for deterioration. External ventricular drainage was done and he improved. Cultures of the pus, blood, and cerebrospinal fluid (CSF) obtained from external drainage were negative. Gram stain of the pus failed to iden-

tify any microorganism. Although the last culture of the CSF revealed *Pseudomonas aeruginosa*, this might have been a contamination. Culture of the sputum revealed the same bacteria.

The abscess cavity was much reduced postoperatively and eventually resolved with antibiotics (Fig. 2). The ventricles appeared to be enlarged, but a radioisotope cisternogram on June 7, 1993, was within normal limits. Although he could understand verbal commands, left hemiplegia and general weakness due to his age meant that he required some help from others in his daily life. He was transferred to the rehabilitation department on the 170th hospital day.

DISCUSSION

Hematoma or fluid collection may become an

Table 1. Summary of reported cases of abscesses from intracerebral hemorrhage

Authors	Year	Age	Sex	Site of hemorrhage	Route of infection	Pathogen	Remark
Israel et al.	1944	27	F	Lt basal ganglia	?	<i>Pneumococcus</i>	eclampsia
Busse et al.	1981	45	M	Rt basal ganglia	sepsis	sterile(BC)	
Biller et al.	1985	34	F	Rt basal ganglia	episiotomy	mixed*	preeclampsia
Kurihara et al.	1989	53	M	Rt putamen	phlebitis(Lt LE)	<i>Staphylococcus</i>	
Biller et al.	1985	62	M	Rt frontal lobe	carotid endarterectomy	<i>Staphylococcus</i>	

BC : blood culture, **Staphylococcus epidermidis*, alpha-hemolytic *Streptococci* and a gram-negative rod ; LE : lower extremity

abscess or empyema being infected either by direct inoculation or by hematogenous spread from a distant focus of infection. A subgaleal abscess or postoperative subdural empyema may be produced by such pathogenic mechanisms. A brain abscess can be produced after operative intervention for intracerebral hemorrhage. However, abscess formation without surgery in a ganglionic hemorrhage is exceptional. Kurihara et al.(1989) had found 14 cases of a brain abscess following a stroke in the literature. Only five cases were related to cerebral hemorrhages, including one lobar hemorrhage (Table 1). In the remaining nine cases, abscess developed from a ischemic stroke.

Brain abscess may develop by direct extension from a contiguous focus of infection, by hematogenous spread from a distant focus of infection, and after cranial surgery or head trauma. Since the ganglia is located deep and apart from the usual foci of infection, ganglionic abscesses are usually metastatic in origin (Molavi and Dinubile, 1988). It was true in four reported ganglionic abscesses from hemorrhage. Infected episiotomy, phlebitis on the extremity, and sepsis of unknown origin were responsible for the abscesses.

Infection within the thorax is the most common metastatic focus of brain abscess, especially in the aged (Molavi and Dinubile, 1988). And pulmonary complications are by far the most frequent extracerebral complication in spontaneous intracerebral hematomas (Regli and Jeanmonod, 1980). Thus, it can be expected that the combination of these two factors would not be rare. But the pulmonary infection was not the origin of four reported ganglionic abscesses. Although *Streptococci* were the most common organism cultured directly from abscess (Law et al., 1976 ; Molavi and Dinubile, 1988), *Staphylococcus* and *Pneumococcus* were found in three occasions of four reported ganglionic abscesses. We assumed that sudden fever with general-

ized skin rashes in our case suggested streptococcal septicemia instead of pulmonary infection.

Ganglionic abscess might be tubercular, pyogenic or fungal (Bhatia et al., 1986). As in this case, pyogenic abscess has a much shorter duration of symptoms than tubercular or fungal (Bhatia et al., 1986). In some reported cases, medical therapy alone has been successful (Bhatia et al., 1986). However, aspiration with adequate medical therapy is the treatment of choice for the ganglionic abscess (Law et al., 1976 ; Molavi and Dinubile, 1988). The danger of leakage from an abscess into the ventricular system during aspiration has been reported to be small (Law et al., 1976).

In 15-25% of brain abscesses, the primary source of infection was not found, and was designated as cryptogenic (Molavi and Dinubile, 1988). As rare causes of brain abscess, dental care (Wohl et al., 1991), usage of halo (Williams et al., 1992), and esophageal sclerotherapy (Algoed et al., 1992) have been recently reported. However, abscess formation without surgery in a ganglionic hemorrhage is rare enough to be reported briefly.

Unfortunately, a correct diagnosis was made late in this case. A rapid resolution of the hematoma with strong ring enhancement and a high fever strongly suggested the abscess formation, although such a complication is rare. Abscess formation should be considered when the hematoma resolved rapidly in patients having an intracerebral hemorrhage with a high fever.

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