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Aneurysmal intracerebral hemorrhage in a young patient: etiology and emergency treatment

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Introduction

Clinically significant intracerebral hematoma (ICH) is seen in 4-77% of patients with subarachnoidal hemorrhage (SAH) from aneurysms (1). ICH can be diagnosed easily by computed tomographic (CT) scanning. The patients can be operated without angiography when there is evidence of life threatening hematoma with or without SAH (2). The evacuation of the hematoma and the clipping of the aneurysm should be done at the same operation (1). There is a statistical difference between mortality and morbidity rates of the patients treated surgically or conservatively (2).

In this report or twenty - three years old patientwith ICH and renal artery occlusion is presented.

Case report

A 23-years-old man was brought to another hospital after a sudden loss of consciousness and weakness of left arm and leg. The cranial CT scan was performed and he was referred to our clinic for further investigation and treatment. At the first examination at our emergency department; Glascow Coma Scale (GCS) was 13 (eye response: 3, motor response: 6, verbal response: 4 (E3M6V4)) World Federation of Neurosurgeon Scale (WFNS): Grade III, neckstiffnes (+)/4, left hemiparesis with central facial paresis, bilateral positive Babinsky were found. Although he did not have a hypertension attack previously, his arterial blood pressure was 190/130 mmHg. His cranial CT scan showed a right frontotemporal haematoma next to the sylvian fissure and SAH especially in the anterior cisterns (Figure 1).

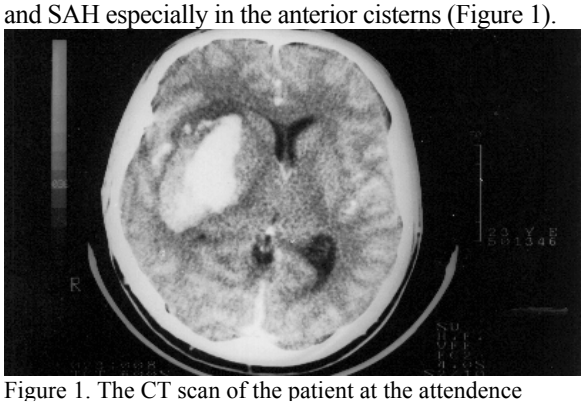

Figure 1. The CT scan of the patient at the attendence

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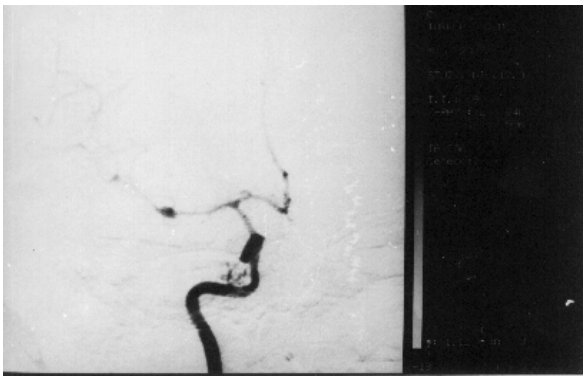

Figure 2. The first angiography showing the fusiform aneurysm of right middle cerebral artery.

Considering SAH, an angiography was planned and conservative treatment was started. High arterial blood pressure continued in spite of medical therapy, and he showed neurological progression in a few minutes. His right pupil dilated and he was spontaneously bilaterally decerebrate. The patient was intubated and transferred to the operating room. After large right frontotemporal craniotomy, ICH was evacuated and sylvian cistern was dissected. Aneurysm dilatation and appearance of haemorrhage were not seen in the right middle cerebral trunk. After the haemostasis, dura was left open and bone flap was placed subcutaneously in the lateral side of the right leg. Postoperatively he was taken to intensive care unit with mild neurologic improvement. On the third postoperative day, digital subtraction angiography (DSA) was performed and a right fusiform middle cerebral artery (MCA) bifurcation aneurysm and left baby saccular MCA bifurcation aneurysm were demonstrated (Figure 2). As the arterial catheter was pulled out, a single dose of contrast agent was given to the aorta at the level of the renal arteries because of the continued severe hypertension (over 170 /110 mmHg) and occlusion of the left renal artery was observed. After the angiography, we waited for a decrease in the patient's GCS. Twelve days after the first operation, he was re-operated and right MCA bifurcation fusiform aneurysm, which had not been seen initially, was visualised. It was seen in bifurcation and closed with circumferential wrapping by lyodura with clip reinforcement. While opening lamina terminalis and chiasmatic cisterns, anterior communicating artery (ACoA) aneurysm was found incidentally and the neck of the aneurysm was clipped. After clipping

these aneurysms, the dissection of the left MCA bifurcation aneurysm was postponed because of fragility of brain and dura was closed by using lyodura. Bone graft at the right leg was put on the craniotomy site. The patient made a good recovery and returned to almost independent activity with left hemiparesis. Control cerebral angiography, which was performed on the third day of the second operation, was normal except vasospasm at the proximal part of right and left MCA bifurcation.

Nineteen days after the second operation, he was transferred to the transplantation unit for the occlusion of the left renal artery. Left nephrectomy was performed because of the absence of renal artery pulsation and abnormal kidney structure. The histopathological examination revealed fibromuscular dysplasia. He was discharged with rehabilitation program of seven days after nephrectomy. One year later, his neurological examination showed only mild paresis on the left arm. His control angiography showed no change on the left MCA aneurysm.

Discussion

Primary brain impairment occurs at the time of the original SAH, but further injury results from the consequent ICH, resulting in mass effect and intracranial hypertension. Prompt removal of the ICH and relief of intracranial pressure can result in dramatic clinical improvement. Moreover simultaneous clipping of the ruptured aneurysm at the time of clot removal appears to lead to better outcome and allows treatment of vasospasm. For patients treated by evacuating the ICH and clipping at the same operation, the mortality rate has been 28-50% (3).

In a randomised study, 15 patients with an ICH caused by an intracranial aneurysm were treated conservatively and 15 operated on as an emergency. A significant statistical difference was found between mortality rates of these groups (80%, 27% respectively) (2).

Tapaninaho et al (4) reported thirty-one patients with large ICH who were operated after CT and angiographic work up. In this study mortality rates were found lower for patients with aneurysm of the MCA, and for those with a better clinical grade. All grade 5 patients with decerebration, anisocoria, or dilated pupils died. In the contrary some authors (1) had good results for the comatose patients with SAH and ICH. The patient presented herc suddenly became deeply comatose with decerebrate rigidity and showed a dilated pupil. His preoperative GCS was 4 (E1M2V1). The efficacy of surgical treatment of intracranial aneurysms is dependent on complete obliteration of the lesion, without compromise with normal cerebral vessels. Preoperative angiography clearly provides definitive vascular anatomy (4). However, in the moribund patient who is detoriating, even single vessel angiography may create a life-threatening delay (3,4,5). The CT scan, if studied carefully, suggests a particular anatomic source of haemorrhage (2). Le Roux et al (5) reported 25 patients with an ICH from a ruptured aneurysm who were urgently operated without angiography. In these groups, infusion CT scanning demonstrated the location of the aneurysm causing ICH in all patients. If MCA aneurysm is not detected in an ICH located in temporal lobe, a posterior carotid wall aneurysm should also be considered.

In recent years, some authors reported the efficiency of intra operative portable DSA for diagnosis and treatment of intracranial vascular lesions (3,5). The patients, operated without angiography, should be controlled with post-operative angiography to confirm aneurysm obliteration and to investigate other pathologies (2). Le Roux et al (5) found eleven unruptured aneurysms by post-operative angiographic examination. Although we did not find any aneurysmal dilatation at the first operation, two aneurysms were seen in angiography, and the third one during operation.

The most common etiological factor of ICH is hypertension. Renal and renovascular diseases account for nearly 80% of secondary hypertension in children and approximately 70% of children with renovascular hypertension have fibromuscular dysplasia (4). DSA represents a major advance in the evaluation of patients with suspected renovascular hypertension. In a young patient with hypertension, renal angiography should be performed, so that if renal ischaemia is observed, angioplasty can be attempted at the same time as arteriography (4).

We performed renal arteriography at the same time with cerebral angiography, and occlusion of left renal artery was detected. Renal angioplasty was tried under sedation but it was unsuccessful. Then, left nephrectomy was performed to correct the hypertension after second cranial operation.

Treatment of fusiform cerebral aneurysms is a controversial subject. In such cases clipping is not safe and endovascular occlusion cannot be accomplished without sacrifiting the parent artery. Fusiform aneurysms are sometimes treated by reinforcement with or without a clip. A variety of wrapping material has been used to inforce aneurysms. We used a circumferential wrapping by lyodura with clip reinforcement technique to treat fusiform MCA bifurcation aneurysm.

As a conclusion we believe that, especially in a young patient with an intraparenchymal haematoma supposed to be the consequence of SAH, even if aneurysm is detected, it is important to evaluate the patient for hypertension.

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