Case Reports and Technical Notes

Ventricular Opacification Secondary to Rupture of Intracranial Aneurysm During Angiography

Case Report

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Although it is generally conceded that early angiography after spontaneous subarachnoid hemorrhage is a relatively safe procedure,1,2 several cases of rupture of an intracranial aneurysm during angiography have been reported.1,3–9 These are characterized by evidence of extravasation of the opaque medium into the cerebral substance or subarachnoid cisterns.7 The following case is unique in that the opaque material apparently penetrated the posterior perforated substance, entering the third ventricle and then the lateral ventricles.

Case Report

Examination. This 51-year-old woman was admitted to the hospital on May 28, 1966, because of sudden loss of consciousness. She had regained consciousness, vomited, complained of a severe headache, and then again lost consciousness. Her pupils were small and fixed, and she developed a positive Babinski sign on the right side. Spinal puncture revealed an initial pressure of 395 mm of water with bloody cerebrospinal fluid. By the following day she was somewhat improved; she responded slightly to painful stimuli and spoke a few words. She was restless and had severe neck stiffness; there was a slight divergent strabismus. Her condition continued to improve and by June 1, 1966, she was somewhat more responsive and would answer questions. There were no lateralizing neurological signs. It was decided that the patient’s condition had stabilized sufficiently for angiography to be carried out.

Angiography. Angiography needles were inserted into each common carotid artery preparatory to performing bilateral carotid angiography. An injection of 8 cc of Renografin-60 was made by hand with a 10 cc syringe into the right common carotid artery; the patient immediately complained of excruciating pain and then became comatose. She developed decerebrate rigidity and Cheyne-Stokes respiration. She was extremely cyanotic. The procedure was abandoned and both needles removed. The pupils became dilated and fixed, and the patient died at 3:00 a.m. on the following day.

X-ray Findings. A series of lateral views of the right carotid circulation was all that was obtained. The initial film at the termination of the injection (Fig. 1 left) showed a large aneurysm about 1 cm in diameter in the right internal carotid artery at the origin of the posterior communicating artery. Just posterior to the aneurysm a semilunar-shaped collection of dye, apparently extravasated, could be seen. There was another linear extravasation extending down along the base of the brain, probably in the basal cisterns around the basilar artery. A smaller linear extravasation extended along the posterior communicating and posterior cerebral arteries.

On a subsequent film (Fig. 1 right) a slight streak of opaque material could also be seen extending upward into the third ventricle with opacification of the anterior portion of the third ventricle. On a still later film (Fig. 2 left) there was fairly good visualization of the third ventricle and also of the lateral ventricles. The final x-ray in the series (Fig. 2 right) showed the lateral and third ventricles to be well outlined. A single lateral x-ray taken about 15 minutes after the injection gave excellent visualization of the posterior portions of the lateral and third ventricles, and the aqueduct and fourth ventricle could be easily outlined. There was also dye in the subarachnoid space outlining the cerebellum. A single anteroposterior film (Fig. 3) taken about 10 minutes later showed excellent

Received for publication January 20, 1967.
Fig. 1. Angiogram exposed at termination of the injection (left) shows an aneurysm of the internal carotid artery with extravasation of the opaque medium. Film taken ½ second later (right) shows beginning opacification of the anterior portion of the third ventricle.

visualization of the lateral and third ventricles.

Autopsy. The autopsy was limited to the head and revealed an extensive subarachnoid hemorrhage. The aneurysm of the internal carotid artery was visualized, and the point of rupture could be seen at the dome. The lateral third and fourth ventricles were completely filled with a cast of clotted blood. The exact path of the bleeding into the ventricles could not be determined, but the blood seemed to pass from the subarachnoid space through the posterior perforated substance into the third ventricle (Fig. 4).

Discussion

Spontaneous subarachnoid hemorrhage with intraventricular hemorrhage is not uncommon, and several cases of rupture of an intracranial aneurysm during angiography have been reported. Our case is similar to that described by Jenkinson, et al., in that the contrast medium also extended along the subarachnoid cisterns beneath the brain stem. However, to our knowledge this is the only known case in which rupture of the aneurysm, which occurred exactly at the time of angiography, caused extravasation of the contrast medium, as well as blood, into

Fig. 2. Film taken 3 seconds after termination of the injection (left) shows good visualization of the third and lateral ventricles. Film taken 5 seconds after termination of the injection (right) shows the lateral and third ventricles to be well outlined.