Extravasation from an Intracranial Aneurysm During Carotid Angiography

Case Report

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Rupture with extravasation of contrast media has been described as a rare complication of cerebral angiography. The case described below represents an unusually large extravasation from an intracranial aneurysm with streaming of contrast material to areas around the distal branches of the middle cerebral artery complex.

Case Report

A 23-year-old auto mechanic was admitted at 1:30 a.m. on April 24, 1966, following a single-car accident. In 1959, he had been hospitalized for cerebral concussion after a similar incident.

Examination. A severe upper respiratory obstruction required immediate endotracheal intubation. The pupils were fixed and dilated. The optic fundi were normal. There were several bruises about the head and lacerations of the nose and chin. The patient responded to deep pain with nonpurposeful movements of all limbs. Deep tendon reflexes were absent, and there was no response when extensor toe signs were tested. X-rays of the skull, cervical spine, and chest were normal.

Over the next few hours, the patient rapidly became more alert and removed his endotracheal tube. The pupils became reactive, small, and equal. He awoke sufficiently to complain of severe headache. By 4:00 p.m. on the day of admission, the patient, although still lethargic, could be easily aroused, and was oriented. During the following day he responded to voice, moved all extremities well, fed himself, and no longer complained of headache. Deep tendon reflexes were symmetrical and hypoactive. Extensor toe signs could not be elicited.

Three days later, the patient again complained of headache, which was severe, diffuse, and throbbing in nature. He remained somewhat lethargic over the next few days and continued to complain of headache, which was not relieved by codeine. Daily funduscopic, motor, and sensory examinations were normal.

A Hg brain scan, performed on May 4, 1966, was normal. An electroencephalogram of May 6 showed diffuse medium voltage, irregularly-shaped 4-7/second activity, and smaller amounts of medium voltage, irregularly-shaped 2-3/second activity intermixed. The patient was discharged on May 10, 1966. At that time, he was alert, and the headache had considerably diminished.

Second Examination. The patient was seen again for a routine follow-up visit on May 16, 1966. He complained of left-sided weakness and diplopia beginning the day before. He had had increasing headache for several days and low back pain. Examination revealed a mild left hemiparesis with brisk deep tendon reflexes accentuated on the right. An extensor toe response had appeared on the left. The patient was admitted to the hospital and a right carotid angiogram was performed using 50% Hypaque. The first series of films was taken in an anteroposterior projection with 15 cc of contrast material injected by hand. A large aneurysm was found at the most distal portion of the internal carotid artery. Because of poor positioning, the base of the skull was not included on these films. His condition did not change following the first injection. A lateral series was then taken, using a second injection of 15 cc of contrast agent. Immediately, the patient became unresponsive. The right pupil dilated and bilateral extensor toe responses were seen. This set of films showed the aneurysm and the progressive extravasation of contrast media into the subarachnoid space.

A lumbar puncture was performed, and bloody spinal fluid with an opening pressure
of 490 mm was obtained in the decubitus position. Following the spinal tap, the patient became more responsive and the bilateral extensor toe signs disappeared.

During that day, however, his condition steadily deteriorated, and the level of consciousness became markedly depressed. He responded to noxious stimuli with a decorticate posturing of the left side. Both pupils became dilated and fixed. Respiration was spontaneous, but irregular, and tracheostomy was done. The next day the patient was flaccid with no response to deep pain. He remained in coma until death occurred on May 22, 1966.

Postmortem Examination. Massive bilateral lobar pneumonia was present. There was generalized subarachnoid hemorrhage with dissection of a hematoma into the substance of the right cerebral hemisphere. An aneurysm was present at the junction of right internal carotid and middle cerebral arteries. Moderate bilateral cerebral edema was noted.

Discussion

Jamieson, in 1954, visualized extravasation from a middle cerebral aneurysm in a 36-year-old man. An angiogram done 1 week after the patient’s initial hemorrhage was without complications. The study was repeated after another week under local anesthesia, and rupture occurred during the fourth injection of 15 cc of Uriodone.

Jenkinson, et al., described an extravasation from an internal carotid aneurysm. The patient, a 49-year-old woman, had three probable bleeding episodes within 1 week before admission. Angiography was done under general anesthesia. The first four placements of the needle were in the external carotid artery. Rupture occurred on the fifth injection of 35% Diodrast with filling of the internal carotid system.

In 1960, Jackson, et al., reported the rupture of an internal carotid artery aneurysm. The patient, a 61-year-old man, bled 1 week before angiography. Under local anesthesia, the needle was easily placed in the right carotid artery. When the left carotid artery was palpated, the patient became hypotensive and lost consciousness. The study was abandoned at that time but was repeated 2 days later. Once again the patient became comatose on palpation of the left carotid artery, but the study was pursued and an injection made into the right carotid artery. The second injection of 50% Hypaque showed extravasation from a right internal carotid artery aneurysm.

Von H. Triska, in 1962, demonstrated extravasation from a middle cerebral artery aneurysm in a 58-year-old woman. The angiogram was done within hours of the patient’s second hemorrhage. Local anesthesia was used, and the contrast agent was 60% Urografin. Rupture occurred on the first injection, and the patient died 36 hours later.

Our patient had at least three episodes of aneurysmal bleeding, the last of these occurring at the time of angiography. The diagnosis was delayed because of the associated head trauma. Initially, the patient was treated as a case of cerebral concussion with severe post-traumatic headache. It now seems likely that he bled at the time of his single-car accident and again 3 weeks later, the day before this angiogram was performed. At angiography, there was difficulty in placement of the needle. Local anesthesia was used, and rupture occurred following the second hand injection of 15 cc of 50% Hypaque. Figures 1, 2, and 3, selected from the lateral projections, show the rupture and progressive streaming of contrast agent into the subarachnoid space around the middle cerebral artery in the Sylvian fissure. Figure 3, taken approximately 3 seconds after injection, reveals contrast