Radiological Demonstration of Rupture of a Carotid Aneurysm During Cerebral Angiography

Case Report

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That cerebral arteriography can carry certain hazards has been repeatedly recognized.\textsuperscript{6,10,12,14,15} The complications are usually due to the trauma of puncturing the vessel, the toxic action of the contrast medium itself, or hydrodynamic disturbances.

The rupture of an intracranial aneurysm during an arteriographic procedure has seldom been visualized radiographically.\textsuperscript{1,9,11,17} The case we are reporting is the only one observed in the last 10 years among the many carotid arteriographies performed in the Radiological Department of the Institutes of Neurosurgery and Neurology of the University of Padua and the Institute of Neurology of the University of Cagliari.

Case Report

This 38-year-old woman had always been in perfect health until 1957 when she contracted typhoid fever; at the same time she started having fits that recurred once every 4 to 10 months and were characterized by vertigo, sweating, and sudden loss of consciousness. Headache and drowsiness were a constant aftermath. The most recent seizure took place 4 days before admission in 1967 and was marked by especially severe headache and repeated vomiting. The patient had never been studied or treated.

Examination. On admission on July 31, 1967, the patient showed slight increase of the tendon reflexes on the right side, moderate anisochoria (left side greater than right), and left anosmia. Urine examination and routine blood tests were negative. X-ray films of the skull were normal with the exception of a faint pea-sized opacity which in the lateral view coincided with the anterior clinoid process and in the anteroposterior view was located to the left of these processes. The electroencephalogram showed moderate irritative abnormalities in the anterior and middle left temporal leads.

Angiography. We considered suprasellar meningioma as a possible diagnosis, and left carotid angiography was performed using Conray 60\%. The patient showed no unfavorable reactions to two consecutive 8 ml doses, but at the end of a third dose became unconscious, with deviation of the head and eyes to the left, apnea, hypotension, and increased pulse rate. These symptoms were caused by extravasation of the contrast medium from the aneurysm into the subarachnoid space, which was fully documented by Figs. 1 and 2. After cessation of the tonic phase, respiration started again, at first periodic, then normal. The patient was comatose with loss of tendon reflexes; there were bilateral Babinski’s signs and anisochoria (right side greater than the left).

In the following days consciousness gradually returned. There was, however, a right hemiplegia and aphasia. In the left fundus oculi, there were hemorrhages around the papilla. Seven months after admission the patient still had flaccid hemiplegia but was able to pronounce some words, although not fluently. The electroencephalogram then showed almost complete absence of cortical activity on the left side.

Discussion

The rupture of an intracranial aneurysm during carotid or vertebral angiography is a rare but possible occurrence. In most cases of subarachnoid hemorrhage, however, angiographic procedures are necessary to diagnose the precise anatomical conditions underlying the hemorrhage\textsuperscript{8} or to clarify a doubtful case such as our own, in which a meningioma was suspected. Decker says, in fact, that a calcification in the wall of an aneurysm is quite rare.\textsuperscript{6}
We are discussing this case to evaluate the possible factors in the rupture of the aneurysm during angiography and to eliminate the easy explanation of an accidental relationship between two coincidental occurrences. Lacking precise measurable anatomic evidence and data because of the dramatic suddenness of the accident, we must make a circumstantial deduction based on previous experience.

The contrast medium used (Conray 60%) is considered one of the safest for cerebral angiography. The technique was the same we had followed in several thousand other carotid or vertebral angiographies with no major complications. The common carotid artery was punctured percutaneously; during each injection, 8 cc of contrast medium were introduced by manual pressure over a period of 2 to 3 seconds. Pressure was not applied to the contralateral carotid; this, if prolonged, leads to a considerable in-

![Fig. 1. Left carotid angiograms. Left: First injection. The image of the aneurysm is projected on the bifurcation of the siphon. Center: Second injection. The aneurysm now appears half filled with contrast medium. Above the anterior clinoid processes there is an oblong image not anatomically definable. Right: Third injection, first film. The aneurysm appears completely filled and bears a concave imprint anteriorly; the size is unchanged. At the posterior pole a diffusion of the contrast medium descends towards the clivus.](image1)

![Fig. 2. Left carotid angiograms. Left: Third injection, second film. A veil of opacity goes around the aneurysm showing this to be very probably vilobate. The contrast medium can be followed around the brain stem in the cisternae. Right: Third injection, third film. The contrast medium is now recognizable in the interhemispheric and basal cisternae.](image2)