SOME FACTORS INFLUENCING THE NONVISUALIZATION OF THE INTERNAL CAROTID ARTERY BY ANGIOGRAPHY

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During the past two decades carotid angiography has been employed with increasing frequency to elucidate cerebral vascular phenomena.

Arteriographic evidence of thrombosis of the internal carotid artery has been reported by many authors since the original paper by Moniz et al. An extensive review of the cases reported in the literature was presented by Johnson and Walker in 1951. The radiographic criterion for the diagnosis has been a failure to demonstrate filling of the internal carotid artery in the neck associated with adequate visualization of the common and external carotid arteries. Sometimes there is filling in the proximal portion of the vessel which comes to an abrupt end. This situation may be seen on successive films despite alteration in timing of exposures. However, Riishede and Ethelberg have reported recently on 5 patients whose arteriograms showed no or partial filling of the internal carotid arteries bilaterally. Subsequent postmortem examinations failed to substantiate any anatomic obliteration. The common clinical feature in all of their cases was a sudden rise in supratentorial pressure with evidence of brain stem compression at the incisura. The authors postulated a diminution of cerebral blood flow resulting reflexly from embarrassment of regulatory pressor centers in the brain stem.

The purpose of this communication is to present 4 additional cases which appear to confirm the fact that certain hemodynamic factors, as yet unexplained, can produce angiographic findings similar to those seen in thrombosis of the internal carotid artery.

CASE REPORTS

Case 1. G.H., a 19-year-old youth, was admitted on Mar. 17, 1955.

Present Illness. Thirty hours previously he awoke in the morning complaining of headache; however, he went to work. One and one-half hours prior to admission he was seized with severe right head pain. Several generalized tonic and clonic convulsions followed. He was brought to the emergency room in coma.

Significant Past History. Two years before admission he was seen by his doctor for headache and stiff neck. He recovered without sequelae. No diagnostic studies were done.

Examination. Blood pressure was 140/80; pulse rate 66, and respiratory rate 28. The patient was in restless coma with a suggestive left hemiparesis and a left central facial weakness. The right pupil was larger than the left but was reactive to light.
There was a bilateral ankle clonus and a positive Babinski on the right with no plantar response on the left. Mild nuchal rigidity was present. A Grade II systolic murmur at the base was not transmitted. The fundi were normal.

*Laboratory Data.* Hematocrit was 41.5, wbc. 13,950 with 95 per cent polymorphonuclear cells, sedimentation rate 10, and blood serology was negative. A lumbar puncture revealed grossly bloody fluid with a pressure exceeding 600 mm. of water.

*Course.* The patient was observed over the next 8 hours, during which the vital signs were stable. He became responsive and said a few words. The next morning a lumbar puncture revealed a pressure of 330 mm. of water. The fluid was again bloody. Soon thereafter he had another generalized convulsion followed shortly by dilatation and fixation of the right pupil. The right fundus showed several retinal hemorrhages and early chocking of the optic disc. He was taken to the X-ray Department where an endotracheal tube was inserted after intravenous Pentothal. A gallop rhythm developed, with a pulse rate ranging between 200 and 250. Intravenous Pronestyl caused reversion of rhythm to normal. At the beginning of percutaneous arteriography the blood pressure was 110/60 and the pulse rate ranged between 100 and 120. After a stellate block the right common carotid artery was punctured. Despite variations in the timing of exposures, consistent filling of the external carotid and common carotid was obtained with some visualization of the internal carotid in the neck but none intracranially. Consequently, the common carotid was exposed and injection under direct vision was performed with similar results (Fig. 1). Attention was turned to the left carotid vessels. At this point the left pupil became dilated and fixed. Spontaneous respirations ceased. The patient was maintained by artificial respiration via the endotracheal tube. During this time...