CEREBRAL ANGIOGRAPHY IN "BRAIN TUMOR SUSPECTS"

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This is a report of the angiographic findings in a consecutive series of "brain tumor suspects" seen at the Johns Hopkins Hospital during a period of approximately one year. While the concept of "brain tumor suspect" is rather vague, we have used the term to include all cases in which diagnostic procedures such as pneumoencephalography, ventriculography or arteriography were carried out to eliminate the possibility of an intracranial neoplasm. We realize that our index of suspicion is rather high and that at times such procedures were done when we thought the possibility of neoplasm remote. Some patients, had they been seen on the average neurological service, would probably have been classified arbitrarily as having cerebrovascular disease and discharged without the benefit of these techniques. For example, we have made such special examinations in all cases of convulsive seizures occurring for the first time in adult life.

TECHNIQUE OF ARTERIOGRAPHY

Percutaneous puncture of the carotid artery was practiced after infiltration of the skin of the neck with procaine. If the vessel could not be cannulated within a reasonable time, an incision was made and the vessel injected by direct vision. In this series of cases, the carotid artery was successfully punctured percutaneously in 92 of the 96 patients.

The roentgenograms were made in series of 3 films, taken at 1 sec. intervals after the injection of 15 cc. of 35 per cent diodrast. Stereoscopic views were obtained by shifting the x-ray tube and repeating the procedure. As a routine, stereoscopic frontal and lateral projections were made, necessitating 4 injections of the contrast media. The 3 serial films usually demonstrated arterial, capillary and venous phases of the angiogram. There appeared to be great variation in the cerebral circulatory time. Occasionally the arterial phase of the cerebral circulation coincided with the capillary phase of the circulation within the neoplasm; at times the contrast medium remained in the tumor after it had disappeared from the cerebral vessels. These variations in cerebral circulatory time made it necessary to have serial films for good visualization of the intracranial vessels.

During the injection of the diodrast, the patient usually complained of a pain in the neck or head and occasionally jerked or jumped. With proper preparation, however, few complications occurred. Transient hemiparesis and/or aphasia has been seen in 4 patients of this series following angiog-
raphy. In only 1 case of suspected cerebral thrombosis could the procedure have been contributory to the patient’s demise.

RESULTS OF ANGIOGRAPHY

Some 96 “brain tumor suspects” have been subjected to angiography. Of the 93 successful angiograms, we have been able to verify the diagnosis by subsequent operation or autopsy in 54 cases. In 8 cases the angiographic find-

FIG. 1. A. (O. A.) Lateral angiogram (arterial phase) showing a large meningioma of the left olfactory groove displacing the anterior cerebral artery superiorly and posteriorly. A hyperostosis of the tuberculum sellae is apparent. B. (A. H.) Lateral angiogram (arterial phase) demonstrating a central astrocytoma displacing superiorly the anterior cerebral and inferiorly the middle cerebral arteries. Few vessels can be seen within the tumor.

ings were indicative of a lesion (in 7 instances neoplasm, in 1 porencephaly) but for medical or personal reasons it was not verified; in 31 cases the arteriogram was interpreted as normal, and in 24 of these cases in which air studies were made, pneumoencephalograms did not suggest a space-occupying lesion. In 1 patient having a normal angiogram, a thalamic tumor was demonstrated by an air study.

LOCALIZATION OF TUMOR BY ANGIOGRAPHY

Angiograms may indicate the presence of a space-occupying lesion by distortion of normal vascular structures or by showing the intrinsic vascular pattern of the tumor.