CAROTID ANGIOGRAPHY AND CEREBRAL ABSCESS

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The clinical diagnosis and localisation of a cerebral abscess is sometimes a simple matter. Unfortunately this is not always so, and in many cases the neurosurgeon will need all the information that can be provided by electroencephalography and various radiological techniques. The possible hazards of ventriculography, and more especially of lumbar encephalography, are well recognised, and the information gained is sometimes limited.

In recent years carotid angiography has largely replaced air studies as the investigation of choice, and we have found this method very valuable. This paper, however, describes 3 patients with proven cerebral abscesses, in whom carotid angiography was seriously misleading.

CASE REPORTS

Case 1. H.P., a boy aged 15 months, was admitted to the Cardiff Royal Infirmary on March 30, 1961. Two weeks previously a left hemiplegia developed which in 24 hours became almost complete.

He was first admitted to another hospital, where lumbar puncture revealed cerebrospinal fluid containing less than 1 cell per c.mm. and 30 mg. of protein per 100 ml. Four days later purulent meningitis developed with a temperature of 103.5°F. The lumbar cerebrospinal fluid at that time contained 26,000 white blood cells, mainly polymorphonuclear, and 280 mg. of protein per 100 ml. Pneumococcus was later cultured from this fluid.

He was treated with systemic antibiotics, Sulphadiazine, penicillin, streptomycin, and Chloramphenicol, but the cells in the cerebrospinal fluid did not fall below 300 per c.mm. and after an initial improvement his clinical state deteriorated. During this period a systolic murmur was noted in the 3rd left intercostal space and this became steadily louder.

On the day of his admission here, under general anaesthesia, right carotid angiography was performed with 35 per cent Hypaque. The resulting roentgen-ray films showed very satisfactory filling of the cerebral vessels, and there was no abnormality to be seen (Figs. 1 and 2).

The electroencephalogram showed high-voltage slow activity in all leads but no sustained focus.

After 3 more days of treatment with antibiotics, including intrathecal penicillin, there was little change in his condition and therefore on April 2, 1961 exploratory burr holes were made under general anaesthesia. The right lateral ventricle was found to contain frankly purulent fluid with 34,940 white blood cells per c.mm., whereas in the lumbar cerebrospinal fluid the count of cells had been steadily falling, and on that day was only 170 white blood cells per c.mm.

He was then treated with intraventricular penicillin in addition to systemic drugs, and thereafter he steadily improved. The systolic murmur disappeared about 3 weeks after admission.

On April 10, 1961 air ventriculography revealed a mildly dilated ventricular system, with an air-filled “diverticulum” extending laterally from the body of the right lateral ventricle (Figs. 3 and 4). This abnormal cavity measured approximately 2.5X1X1 cm. and presumably corresponded to an abscess which had ruptured into the ventricle.

Four months after the illness, at the age of 19 months, he was well, but had a mild left hemiplegia affecting mainly the hand.

We believe that this was a metastatic cerebral abscess, possibly associated with a bacterial endocarditis.

Case 2. E.D., a man aged 62 years, was admitted on Aug. 16, 1960. His left ear had discharged intermittently since childhood, hearing was impaired on that side, and for 4 days he had suffered from pain in that ear.

Two days after admission lumbar puncture yielded cerebrospinal fluid containing 88 polymorphonuclear cells per c.mm. During the course of a radical mastoidectomy on that side an area of dura mater in the middle fossa was found to be exposed.

On Aug. 22, 1960 right-sided convulsions began and spread to become a generalised status epilep-
ticus. This episode was controlled with anticonvulsant drugs but from that time he was dysphasic. On Aug. 23, 1960 electroencephalography showed a focus of delta waves in the left frontal region, and a spike focus in the left temporal region.

On the same day left carotid angiography was performed, and these films showed no abnormality. He was treated with penicillin and streptomycin systemically and for a time his condition remained unchanged.

On Sept. 1, 1960 the cells in the cerebrospinal fluid had risen to 450 per c.mm., and during the succeeding days his state of consciousness deteriorated.

On Sept. 5, 1960 a left posterior temporal burr hole was made and the underlying brain was explored by needling. A small abscess was discovered at a depth of 3.5 cm. and 7 cc. of pus were aspirated. At about this time a suppurative ventriculitis developed which failed to respond even to vigorous chemotherapy. He died on Sept. 17, 1960.

Case 3. P.B., a girl aged 9 years, was admitted on Aug. 17, 1959. This child had a subdural abscess in July 1958. She had been well previously and no cause for this abscess was found. Later multiple cerebral abscesses developed in the left frontal and left parietal regions. These were needled and drained, and were later drained more completely through a formal craniotomy. The first specimens of pus grew a Staphylococcus aureus.

In May, 1959 osteomyelitis had developed in the bone flap, and some sequestra were removed. She was then mildly dysphasic, there was some weakness of her right arm, and she had a right homonymous hemianopia.

During August 1959 she suffered from headache.