Interhemispheric Subdural Empyema: Angiographic Appearance

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During the development of an intracranial subdural empyema, pus may loculate occasionally in the subdural space between the falx cerebri and the medial surface of the cerebral hemisphere (interhemispheric or falcine subdural empyema or abscess) [5,11,15,17]. This uncommon condition is usually diagnosed and treated by parasagittal trephination.

Our report demonstrates that a falcine subdural empyema can be shown preoperatively by cerebral angiography.

Case Reports

Case 1. An 11-year-old girl was admitted to a local hospital on November 19, 1967, with an upper respiratory infection and fever of 1 week's duration. The child was lethargic, with neck stiffness, a slight left central facial paresis, and a left hemiparesis which was most marked in the left leg. Lumbar puncture showed the cerebrospinal fluid (CSF) to be clear and colorless, with 5 polymorphonuclear leukocytes and 7 lymphocytes and mononuclear leukocytes per cu mm, a protein content of 23 mg%, and a sugar content of 58 mg%. No organisms were seen on a smear of the spinal fluid, and cultures were also negative. Skull x-ray films and isotope encephalography (Tc99m) were interpreted as normal. The patient was treated with intravenous penicillin and chloramphenicol, and was transferred to Duke Hospital on November 22.

Examination. On admission to Duke Hospital, the patient's neurological status was essentially the same as it had been 3 days previously. Lumbar puncture showed a CSF pressure of 315 mm. There were 280 leukocytes per cu mm, of which 80% were polymorphonuclear. The CSF protein was 82 mg%, CSF sugar was 48 mg%, with a simultaneous blood sugar of 115 mg%. No organisms could be identified in smears, India ink preparations, or cultures of the CSF. Tuberculin and fungal skin tests were also negative.

The initial electroencephalogram showed suppression of normal rhythms and the occurrence of epileptic discharges and slow waves over the right cerebral hemisphere above the fissure of Sylvius. Isotope encephalography (Tc99m) showed a slight increase in tracer activity over the right cerebral hemisphere. These findings were thought to indicate either a subdural empyema or a diffuse cerebritis on the right side. A right carotid arteriogram on November 28 demonstrated only a slight shift of the midline vessels to the left.

Course. Despite therapy with penicillin, chloramphenicol, and other antibiotics, the patient remained febrile and her neurological status deteriorated. By November 30 she was comatose; CSF pressure was now greater than 470 mm and the fluid contained 20 mononuclear and 1 polymorphonuclear leukocytes per cu mm. Again no organisms could be cultured.

By December 5, the patient had a dilated and fixed right pupil and was having seizures. An electroencephalogram showed theta and delta rhythms bilaterally, with marked reduction of voltages over the right cerebral hemisphere. A retrograde right brachial arteriogram showed an oval avascular area along the falx cerebri, best demonstrated in the late arterial phase (Fig. 1). The significance of this angiographic pattern was not fully appreciated, and a fractional pneumoencephalogram was performed on December 6. This was normal, with no deformation of the lateral ventricles. However, the subarachnoid spaces over the cerebral hemispheres were not filled.

Subsequently, the patient's neurological status fluctuated somewhat, but she never improved significantly. She continued to...
have intermittent fever and her electroencephalogram showed no change. Brain scans on December 14 and December 28 (Tc\textsuperscript{99m}) showed slight diffuse retention over the right cerebral hemisphere, with a band of retention along the sagittal midline on the anteroposterior and posteroanterior views (Fig. 2).

The patient’s condition deteriorated further, and she died on December 30.

Postmortem examination. A large sterile subdural empyema was seen over the surface of the right cerebral hemisphere, and along both sides of the falx cerebri (Fig. 3). No definite source of the empyema could be established.

Case 2. An 11-year-old boy was admitted to Duke Hospital on December 26, 1968, with an upper respiratory infection, fever, and right frontal headache of 1 week’s duration. The patient had developed slight proptosis of the right eye and mild neck stiffness 5 days before admission, and a left hemiparesis, more marked in the left leg, 2 days before admission.

Examination. Neurological abnormalities consisted of lethargy, slight proptosis of the...