Brain Abscess in Children with Congenital
Heart Disease: I

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Though the first description of a cyanotic boy, age 9, with Fallot’s tetralogy and a brain abscess was that of Farré (1814), it was not until 1880 that the causal association of congenital heart disease (CHD) with brain abscess was made. In 1881, Stone and Peacock each published a case in which the initial symptom was headache. By 1945, only 26 cases of cerebral abscess in CHD had been published.

Though Macewen, in his publication of 1883, did not mention the association of cerebral abscess with CHD, he did suggest that “one might almost conclude that in uncomplicated abscess of the brain, operated on at a fairly early period, recovery ought to be the rule.” He came to this conclusion after having 18 recoveries among 19 patients operated upon for brain abscess. In 1940, only 3 cases of cerebral abscess in children with CHD had been operated upon, and it was not until the case of Smolik et al. in 1946, that a case of brain abscess in a child with CHD was cured surgically. In 1956, Newton reported that a total of 11 cases of cerebral abscess in CHD had been treated successfully. In Matson’s series of 13 cases, there were 6 survivors (all operated on).

The purpose of this report is to contrast the excellent results obtained in these children when the brain abscess is suspected with the universally catastrophic results when the abscess is not diagnosed, and to discuss the clinical and laboratory diagnosis of brain abscess in the child with CHD.

Case Histories

The material consists of 19 children with CHD and cerebral abscess, seen by one or another of the authors at the Children’s Memorial Hospital or the Cook County Hospital. One patient (Case 17) was seen by AJR at the University of Chicago Clinics.

Case 1. A 4-year-old boy with tetralogy of Fallot, was admitted to the hospital with a 2-week history of headaches and vomiting. He became comatose following a grand mal convulsion. He had bilateral dilated fixed pupils and papilledema. It was necessary to perform artificial respiration on the child from shortly after admission until his death, approximately 3 hours following bilateral, fronto-parietal burr holes and negative probing attempts at needle drainage of the abscess. At autopsy there was an abscess in the right fronto-parietal lobe.

Case 2. A 6-year-old boy with tetralogy of Fallot, upon whom an aortic pulmonary shunt was performed at 6 months of age, did well until 1 month prior to admission, at which time he suffered the onset of headaches and vomiting. On admission, he had nuchal rigidity, bilateral papilledema, spasticity in both legs, and bilateral ankle clonus. One hour following admission, he had a generalized convulsion, developed bilateral extensor plantar responses, and his pupils became dilated and unequal. On the day of admission, the brain abscess was drained through a right frontal burr hole. It was necessary to tap the abscess again 3 weeks later and to resect it 5 weeks later. The patient was discharged asymptomatic.

Case 3. This 9-year-old boy with transposition of the great vessels suddenly became aphasic and unable to recognize his parents on the day of admission. He had a global aphasia, a right hemiparesis, and impaired sensation in the right arm. Electroencephalography (EEG) revealed a left temporal slow-wave focus. A diagnosis of septic cerebral embolism was made. A Baffles procedure (partial correction of transposition) was done. One month after admission, the boy was discharged.

Two weeks after discharge, he was readmitted with a history of fever and generalized convulsions of one day’s duration. He now was also
Brain Abscess with Congenital Heart Disease

ataxic. Carotid angiography revealed the presence of a mass in the left parietal lobe. He was discharged 2 weeks after needle drainage of an abscess in the left parietal lobe and did well for 3 months. At that time he was readmitted with vomiting, fever, and left-sided headache. Carotid angiography revealed the abscess still present in the left temporoparietal lobes. A craniotomy and resection of the abscess was performed 2 days later. He was discharged aphaslic and hemiplegic on the 14th post-operative day.

Case 4. An 11-year-old boy with tetralogy of Fallot was admitted with a 1-week history of listlessness, headache (frontal-occipital), dizziness, forceful vomiting, and a 4-lb. weight loss.

Lumbar puncture showed a spinal fluid pressure of 246 mm. of water. EEG revealed slow-wave activity in the left temporal lobe. An abscess in the left occipital lobe was drained by needle tap through a burr hole. One cc. of thorotrast was injected into the abscess cavity. Follow-up skull films were taken. It was necessary to tap the abscess on 2 later occasions. He was discharged asymptomatic.

Case 5. A 14-year-old girl with a tetralogy of Fallot began to have seizures at 12 years of age. These were characterized by a sudden onset of blindness, then by appearance of a shadow-like frame in the left temporal field, followed by a scream and generalized convulsions. She had left hemiparesis. A diagnosis of convulsive disorder following an old cerebral infarct was made. She was put on anti-convulsant medication and discharged. Three weeks later, she was readmitted with a three-day history of disorientation, irritability, visual disturbances of the same nature as those which had preceded her seizures. The carotid angiogram revealed a space-occupying lesion in the left occipital lobe. Craniotomy and biopsy revealed the presence of multiple abscess cavities in the left occipital lobe. No resection of these cavities was attempted.

Case 6. A 9-year-old boy, with transposition of the great vessels was admitted with a history of fever and headache of 4 weeks' duration, and nausea of 3 weeks' duration.

He had nuchal rigidity and a positive Brudzinski. The EEG showed a right temporo-occipital, 14 per second spike discharge. The child was given antibiotics, improved, and was discharged. One month later, he was readmitted complaining of severe headache and vomiting. He was lethargic, had a right hemiparesis, anisocoria, bilateral papilledema, and right hyperreflexia.

Carotid angiography revealed the presence of a mass in the left temporal lobe. On the same day, the pus was evacuated through a burr hole. The next day, a temporal flap was turned and the abscess cavity along with some of the infarcted brain resected. The patient died 2 days later.

Case 8. An 8-year-old girl with a truncus arteriosus was admitted because of a right hemiparesis of 2 weeks' duration. She had also had 3 generalized convulsions in the same period. On the date of admission, she suddenly became comatose. The optic discs were blurred. Her left pupil was larger than the right; both were fixed to light. She died 40 minutes after admission. Autopsy examination verified the presence of an intracerebral abscess.

Case 9. A 15-year-old girl with a truncus communis had been lethargic for several months prior to admission. Objective examination revealed cyanosis, an enlarged heart, bilateral papilledema, and hemorrhages in both fundi. Two days after admission a ventriculogram was performed, but there was inadequate filling. On the same date, craniotomy and right subtemporal decompression were performed. She died on the day of surgery. Autopsy examination verified the presence of an intracerebral abscess.

Case 10. A 13-year-old girl, with a ventricular septal defect and transposition of the great vessels, awakened one morning with a right hemiparesis. She was treated with antibiotics. The hemiparesis cleared. Six months later, the right hemiparesis recurred and she became dysphasic.

EEG showed generalized slowing in the left fronto-temporal area. A diagnosis of brain abscess was made. The family elected to have a neurosurgeon in their home town do the surgery. He reported that 2 abscesses were removed from the left frontoparietal area and that the child did well thereafter.

Case 11. A 2½-year-old boy with an interventricular septal defect became anorexic 4 days prior to admission. Two days prior to admission, he began to have generalized convulsions. On that same day, the left eye-lid drooped.

On admission, he was stuporous and pale. There was a left oculomotor paresis, a left facial paresis, and right hemiparesis.

Skull films showed separation of the coronal and sagittal sutures. The pneumoencephalogram revealed a shift of the third ventricle to the right. The next day bilateral parietal burr holes and needling of the brain revealed no abscess cavity. Over the next two days, the child's condition worsened. On the 3rd hospital day, repeat needling in the left hemisphere tapped an abscess, but the child died on the 5th hospital day.

Case 12. A 7-year-old girl, who had transposition of the great vessels, was admitted to hospital