PARADOXIC BRAIN ABSCESSES IN CONGENITAL HEART DISEASE

IRA COHEN, M.D., PHILIP S. BERGMAN, M.D., AND LEONARD MALIS, M.D.

Neurosurgical Service, Mount Sinai Hospital, New York, N. Y.

(Received for publication July 11, 1950)

Paradoxic brain abscess is the name given to a certain form of metastatic abscess occurring in patients without pulmonary suppuration, but with congenital cardiac defects permitting venous blood to circulate in the arterial system without passing through the lungs.

This type of brain abscess is rare, presumably because of the combination of factors that must exist before such lesions can develop. Compared with metastatic abscesses arising from chronic suppuration in the lungs, Ruhberg15 found that a paradoxic abscess occurred once for every 13 cases of metastasis from lung disease. The rarity of the condition is further emphasized by Hanna,16 who recorded 6 cases of paradoxic abscess in 160 fatal cases of congenital cardiac disease. Robbins17 found almost the same proportion (3 in 53), but Abbott's18 percentage was much lower (7 in 1000).

Only 39 cases of paradoxic brain abscess could be found reported in the literature.2-9,11-16,19-22 Largely because of failure to recognize this condition and the extremely rapid course in some of these patients, they fared almost uniformly badly. Up to the present time, only 1 patient has been cured. This report deals with a patient who is apparently well 1 year after treatment.

CASE REPORT

The patient was a college student, aged 22 years. She first came to the Mount Sinai Hospital in 1946, with signs of a generalized infection. A complete investigation at that time established the diagnosis of subacute bacterial endocarditis (endarteritis?). The basic cardiac lesion was tetralogy of Fallot with a patent ductus arteriosus, confirmed by angiocardiography. The infection responded well to penicillin treatment, and she was discharged, apparently cured. She had no further complaints until November, 1948, when a routine dental prophylaxis was carried out. Four days later she complained of malaise, nausea and chills; her temperature was 101°. For the next week she continued to run a low-grade fever and complained of headache. The day prior to admission she had what was apparently a generalized convulsion. No antibiotics were given before or after the dental work. A blood culture taken by her physician was negative.

Examination. Temperature was 100.4°, pulse rate 100, and B.P. 110/74. There was pronounced cyanosis. A continuous, to-and-fro, machinery-like murmur was heard at the pulmonic area; there was a thrill at the pulmonic area and at Erb's point. A severe kyphoscoliosis was noted. The tip of the spleen was just palpable. She showed some drowsiness and loss of recent memory. There was repeated vomiting, and she complained of severe headache, worse on the right side. There was a Babinski sign bilaterally, with transient bilateral ankle clonus. On double simultaneous stimulation a left hemihypesthesia, without astereognosis was noted. There was early papilledema bilaterally, worse on the right, with marked venous engorgement. A complete left homonymous hemianopsia was found. There was bilateral periorbital edema and tenderness in the right frontotemporal region.

Hb. was 13.9 gm. WBC was 19,400, with a shift to the left. Sedimentation rate was normal on two occasions. Repeated blood cultures were sterile. X-ray of the skull showed no abnormality. EEG showed a large amount of very slow (1-2/sec) activity in the right posterior temporal region. A lumbar puncture yielded clear, colorless fluid, under a pressure of 220 mm.; it was otherwise normal. The blood and CSF Wassermann reaction was negative. X-ray of the
chest showed the typical boot-shaped heart of tetralogy of Fallot and marked kyphoscoliosis (Fig. 1).

A diagnosis of brain abscess was made and she was transferred to the neurosurgical service.

Treatment. Penicillin (aqueous procaine penicillin, 600,000 units a day) was started at the time of admission and given continuously thereafter. For a while it appeared that penicillin alone was going to control the infection. About 2 weeks later, however, the papilledema increased, the EEG abnormality became more pronounced, and the neurological signs advanced.

1st Operation. On Jan. 4, 1949 the senior author made a burr hole in the right temporal bone. With the exploring needle, an abscess cavity was encountered in the right temporal lobe, and 5 cc. of thick yellowish-white, odorless pus were aspirated. The abscess was not encapsulated and at one time the needle, of its own weight, fell into the temporal horn of the lateral ventricle. Penicillin solution was instilled into the cavity and the wound closed without drainage. A culture of the pus yielded no growth, and no organisms were seen on direct smear.

Course. For the next few days, the papilledema appeared to be receding and the patient felt well, but she soon complained of severe headache and began to vomit. The abscess was again aspirated and 5 cc. of thick reddish pus were obtained. Into the abscess cavity penicillin solution and 1 cc. of pantopaque (R) were injected.

X-rays of the skull taken after this procedure showed a spherical mass of pantopaque (R), about 1.5 cm. in diameter, deep in the right temporal lobe; droplets of pantopaque could be seen scattered throughout the ventricular system (Fig. 2).

---

Fig. 1. X-ray of the chest, showing typical heart shadow.

Fig. 2. Showing pantopaque in the right temporal lobe and scattered droplets in the ventricles.