Clinical Notes

MULTIPLE TUBERCULOMAS AND INFARCTIONS OF THE BRAIN: REPORT OF A CASE*

ROBERT A. MOORE, M.D., CLEVELAND
Hanna Research Fellow in Pathology

Tuberculous arteritis of the cerebral arteries in tuberculous meningitis is not uncommon, but an associated thrombosis with infarction of the brain is of sufficient rarity to warrant this report.

REPORT OF CASE

History.—A colored girl, aged 5½, was admitted to the Babies' and Children's Hospital because of cough and fever of two weeks' duration. The history of birth was normal. Development and dentition were retarded. The past history was unimportant, except for measles one year before.

Examination.—The child was fairly well nourished and well developed, with a dry, scaly skin covered by a follicular papular eruption. The cervical lymph nodes were slightly enlarged. There was a purulent discharge from the nose. The percussion note over the right side of the chest was impaired, and there were numerous moist crepitant râles in this region. The heart was normal, except for a rough systolic murmur at the apex. There was a small umbilical hernia, 1.5 cm. in diameter. The liver extended 3 cm. below the costal border. Roentgenologic examination of the chest revealed a diffuse infiltration of both lungs with denser shadows at the right hilus. The spinal fluid was turbid, contained 73 cells per cubic millimeter and was negative for acid-fast bacilli. The tuberculin test was positive in dilutions of 1:100 and 1:1,000. The urine was normal. Examination of the blood revealed: hemoglobin, 70 per cent (Talquist); white cells, 13,100; polymorphonuclears, 62 per cent; lymphocytes, 30 per cent; eosinophils, 2 per cent; mononuclears, 6 per cent.

Course.—Pulmonary and cerebral symptoms became more marked, and death occurred three weeks after admission.

Clinical Diagnosis: The diagnosis was disseminated miliary tuberculosis and tuberculous meningitis.

Autopsy.—Autopsy, performed six hours after death, revealed acute miliary and conglomerate tuberculosis of both lungs with cavitation of the right apex, chronic adhesive pleuritis, caseous tuberculosis of the right peribronchial and peritracheal lymph nodes, miliary tuberculosis of the left peribronchial lymph nodes, tuberculous meningitis, multiple tuberculomas of the cerebrum and cerebellum, tuberculous arteritis with thrombosis of the cerebral arteries and infarction of the brain (right frontal lobe, right thalamus and left parietal lobe), miliary tuberculosis of the spleen, liver and kidneys, ulcerative tuberculosis of the ileum, tuberculous mesenteric lymphadenitis, cloudy swelling of the parenchymatous viscera and acute purulent otitis media on the right side.

* Submitted for publication, Jan. 6, 1930.
* From the Institute of Pathology, Western Reserve University, and the Babies' and Children's Hospital.
Fig. 1.—Coronal section through frontal lobes to show the area of infarction in the right middle and superior horizontal frontal convolutions.

Fig. 2.—Coronal section of parietal lobes. Note the area of infarction in the left lobe and the small tuberculoma in the right lobe.
The detailed description will be limited to the brain. The scalp, calvarium and dura mater were normal. The pia-arachnoid was thickened throughout and contained numerous gray-yellow, firm, elevated nodules, from 1 to 2 mm. in diameter. The convolutions of the cerebrum were flat, and the sulci were narrow. The pia-arachnoid over the superior and middle horizontal frontal convolutions was dark red, and the arteries and veins in this area were dilated, firm and filled with dark reddish-gray, friable thrombi. There was a similar area, 1 cm. in diameter, in the left parietal lobe immediately posterior to the Rolandic fissure. On section, these areas extended well into the brain substance (figs. 1 and 2) and were dark red and soft. In the right basal ganglia, there was an area, 3 by 3 by 1 cm., of similar appearance. In the cerebral hemispheres there were five small tuberculomas (fig. 2) varying from 3 to 8 mm. in diameter. There was a large tuberculoma, 1.5 cm. in diameter, in the right cerebellar hemisphere.

Microscopically, the brain substance in the hemorrhagic areas was edematous, and the nuclei of nerve and glia cells were pyknotic. The small blood vessels were filled with hyaline thrombi, and their walls were hyaline and infiltrated with polymorphonuclear leukocytes and lymphocytes. The Virchow-Robin spaces were filled with red blood cells. The larger vessels were filled with gray and mixed thrombi. The remainder of the brain was not unusual, except for slight edema and hyperemia. The tuberculous meningitis and tuberculomas had the usual histologic appearance.

**COMMENT**

Two points in this case deserve further consideration: the pathogenesis of the infarction and the occurrence of multiple tuberculomas. From the microscopic evidence there is little doubt but that the thrombosis is directly associated with a tuberculous inflammation of the arterial wall. Whether this is the sole etiologic agent it is difficult to state. In my experience, miliary tubercles in the wall of the cerebral arteries are common, but I have not observed ulceration of the intima.

The recent literature on the subject includes the papers of Ferris and of van Wagenen. Ferris found eight cases of tuberculoma in thirty-four instances of tuberculous meningitis, and in six the tuberculomas were multiple. Van Wagenen reported fourteen cases of tuberculoma and stated that they are most frequently solitary and located in the cerebellum. Of four cases in children seen in this laboratory, three were multiple. In two, the cerebellum was involved, but this was in association with cerebral lesions. This difference may be due in part to the source of the material. Van Wagenen's cases were from the surgical clinic of Cushing, while those of Ferris and this laboratory were observed in material from autopsies.

Small tuberculomas should not be confused with miliary tubercles of the brain substance. In practically every case of tuberculous meningitis, grayish-yellow soft areas, from 0.5 to 1 mm. in diameter, surrounded by a zone of hyperemia, are found throughout the brain substance. These represent early lesions, and it appears that the occurrence of gross tuberculomas depends in part on the severity of the associated meningitis and the survival of the patient for a sufficient time to allow full development of the lesions in the brain substance.
