CASE REPORTS

FIBROCASEOUS CEREBELLAR TUBERCULOMA

SURGICAL RESECTION IN CONJUNCTION WITH STREPTOMYCIN THERAPY*

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Ever since Hahn\(^4\) in 1880 made the first attempt to extirpate a cerebral tuberculoma, there has been much discussion as to the applicability of surgical measures to tuberculous lesions of the brain. While most authors agree that a circumscribed tuberculoma near the cerebral surface lends itself well to total resection,\(^2,8,9\) Van Wagenen in his classical review questions the value of extirpation as a curative measure.\(^12\) The latter, as well as Buchstein and Adson,\(^2\) particularly stresses the discouraging results from surgical resection of the cerebellar tuberculoma. Recurrence of symptoms or postoperative tuberculous meningitis resulting in death has been the usual sequel to partial or attempted total resection of a cerebellar lesion.\(^2,8,12\) Buchstein and Adson\(^2\) list technical difficulties and structural peculiarity of cerebellar tuberculomas as reasons for poor results. An exception in the literature is Frazier’s case,\(^11\) the patient having been reported by Kwan\(^8\) as living and well 11 years after total extirpation of a large, solid cerebellar tuberculoma.

Sufficient evidence has been accumulated to show that streptomycin may be an effective therapeutic agent in the treatment of tuberculous meningitis.\(^3,7\) It has also been shown that within 90 days the tubercle bacillus tends to develop strains resistant to streptomycin in the majority of patients.\(^4\) Streptomycin does not readily penetrate into brain substance.\(^1\) On the basis of experimental evidence, Rhymers, Wallace, and co-workers\(^10,13\) have proposed the actual presence of a streptomycin inhibitor within the cerebral tissue. One may therefore presume that streptomycin might prevent or cure a postoperative tuberculous meningitis, but that it will not be effective in the treatment of an existing intracerebral tuberculoma. Obrador and Urquiza,\(^9\) in a recent report of a tuberculoma abscess, have already stressed their impression that streptomycin may become a powerful ally of surgical technique in the treatment of tuberculomas of the brain and that it may ward off the bacillary spread in the cerebrospinal fluid which so frequently follows attempts at removal.

It seems, then, that the advent of streptomycin throws a new light on the applicability of surgical measures to tuberculous lesions of the brain. Little can be expected from any partial resection of an intracranial tuberculoma. Total surgical extirpation, however, in conjunction with intramuscular and intrathecal streptomycin therapy as applied in the case to be presented, might well prove to enhance the life expectancy of patients with tuberculous lesions of the brain.

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FIBROCASEOUS CEREBELLAR TUBERCULOMA

CASE REPORT

A.T., a 25-year-old, right-handed, colored veteran, was admitted to Kennedy Veterans Administration Hospital on March 19, 1948, with a history of intermittent, throbbing, bifrontal headaches, which first occurred in 1945. In January 1948, they increased in severity. The patient began to stagger and to walk on a broad base. Two weeks prior to admission he started to vomit and to complain of blurred vision. Members of the family had noticed some slurring of his speech. Twenty-four hours prior to admission double vision occurred on looking to the right.

Examination. The patient was rather poorly developed and undernourished. He was rational and oriented, but appeared drowsy. His speech was thick and slurred. Scalp and skull were tender to pressure and percussion. There was bilateral papilledema of 2–3 D. The 6th nerve was paralyzed on the right and slightly impaired on the left. Flattening of the nasolabial fold was suggestive of an upper motor neuron paresis of the left 7th nerve. The 11th and 12th nerves were partially paralyzed on the right. There was considerable dysmetria of right upper and lower extremity. Barré’s sign was positive on the right. Romberg was positive. The patient walked on a broad base, staggering and falling to either side. There was diminution of two-point discrimination and position sense in the right lower extremity. Deep tendon and superficial reflexes were equally active bilaterally; there were no pathological toe signs and no clonus. The patient had moderately severe photophobia, but showed no other meningeal signs.

The systemic findings were normal. It is noteworthy that the chest film did not show any pulmonary disease. The provisional diagnosis of a space-occupying lesion involving the right cerebellar hemisphere seemed well established.

On March 22, 1948, bilateral posterior burr holes were made. Ventriculography on March 23 showed symmetrical dilatation of the lateral ventricles, dilatation of the 3rd ventricle, and obstruction of the ventricular system at the midportion of the aqueduct of Sylvius. The patient tolerated the procedure poorly and showed signs of decompensation. It was necessary to postpone surgical treatment and to allow the patient to compensate for the severely increased intracranial pressure by continuous ventricular drainage. Within 3 days, blood pressure, pulse, and respiration became stable.

1st Operation. On March 30, 1948 a bilateral suboccipital craniectomy was performed (A.M.M.). The dura was opened over the right cerebellar hemisphere and found to be loosely attached to the arachnoid, which was quite firmly adherent to an underlying yellow-grayish granulomatous mass. Frozen sections identified this as a fibrocaseous tuberculoma. The operation was limited to decompression and biopsy.

Postoperative Course. The patient was given streptomycin, 0.4 gm. intramuscularly 5 times daily, and 60 mg. intrathecally 3 times per week. He also received 4 gm. of promin intravenously daily with 1 week’s rest interval between each 2 weeks of promin administration. On the strength of previously cited experimental and clinical evidence as to the effectiveness of streptomycin in the prevention of tuberculous meningitis, the optimum date for total resection of the granuloma was arbitrarily set 30 days after the initiation of the streptomycin treatment.

2nd Operation. On April 30, 1948 a second-stage suboccipital craniectomy was performed (A.M.M.). Except for a narrow space, containing clear yellow fluid over the right cerebellar hemisphere, dura and galea were attached and the flap had to be dissected away from the dura. The dura overlying the right cerebellar hemisphere was covered with an organized yellowish exudate. In a diameter of 3 cm., covering the lateral and central aspect of the hemisphere, the dura was firmly adherent to the underlying tuberculoma. After the dura had been resected, the granuloma was found to extend rostrally to the tentorium and laterally to the meninges. Medially and rostrally, atrophic and grayish discolored cerebellar cortex could be recognized. The only part of the right cerebellar hemisphere that did not seem to be involved by the granuloma was found caudally and medially. In an attempt at total resection of the granuloma, four-fifths of the hemisphere had to be removed, leaving a narrow strip of cere-
bellum medially and caudally. The cut surface of this area was cauterized. Preserved dura was used for closure of the defect. The patient withstood the operation well.

**Histological Studies** (Fig. 1). There were extensive areas of caseation necrosis surrounded by numerous epitheloid cells, fibroblasts, Langhans' giant cells, and chronic inflammatory cells. In the surrounding brain tissue, marked gliosis could be seen as well as perivascular round-cell infiltration. A few compound granular corpuscles were noted. Acid-fast stain revealed the presence of tubercle bacilli (Fig. 2).

**Course.** The administration of streptomycin intramuscularly and intrathecally, and of promin intravenously, was continued postoperatively until a 120-day period of treatment had been completed. The patient made an uneventful recovery. He gained weight steadily. Except for a persistently slurred speech, all neurological signs disappeared. He was discharged on Aug. 12, 1948.

On Sept. 15, 1948 the patient returned to Kennedy Hospital, complaining of pain in the lumbar region. Neurological examination was entirely negative. There was no evidence of recurrence of the intracranial tuberculoma. He had marked localized tenderness over the 4th lumbar vertebra, moderate spasm of the paravertebral lumbar muscles, and severe pain on straight leg raising. X-rays revealed a moth-
FIBROCASEOUS CEREBELLAR TUBERCULOMA

373
eaten appearance of the 4th lumbar vertebra which seemed typical of a localized osseous tuberculosis. He was transferred to the orthopedic service and placed in a cast. In December 1948, a spinal fusion was performed. The patient has remained afebrile and asymptomatic. At the time of writing, 17 months after total resection of the cerebellar tuberculoma, there has been no evidence of recurrent tuberculous disease of the central nervous system.

SUMMARY AND CONCLUSIONS

1. The pertinent literature with regard to the surgical treatment of intracranial tuberculomas and the effectiveness of streptomycin in combating tuberculous lesions of the central nervous system has been reviewed.

2. The case history of a patient with a fibrocaseous tuberculoma involving the greater part of the right cerebellar hemisphere has been reported. The applied treatment, consisting of total resection of the tuberculoma in conjunction with streptomycin therapy, has been discussed.

3. It is suggested that total resection of an intracranial tuberculoma in conjunction with streptomycin therapy may alter the poor prognosis of tuberculous lesions of the central nervous system.

The pathological sections were studied and diagnosed by Dr. D. James Greiner.

REFERENCES