Tuberculoma of the Brain
A Clinical and Angiographic Study

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At present, tuberculoma of the brain is so rare in some countries as to be a curiosity when it is encountered. A master surgeon of exceptionally wide experience saw no tuberculoma of the brain during the last 20 years of an active career. This statement was made by him when he failed to recognize the characteristic appearance of a tuberculoma of the brain he was operating upon recently.

At the turn of the present century, tuberculoma of the brain was so common as to constitute about 50 per cent of all space-occupying lesions.

With the extension of neurological surgery to some countries, whose standards of living will allow the development of tuberculous infection, tuberculoma of the brain once more is assuming great importance.

It is common for those neurosurgeons working in localities where tuberculoma of the brain presents real problems, to have received their training, as we have had ours, at foreign centers where this lesion is seldom met with. Accordingly, when they go back to their own countries, they have to develop their personal experience with little guide from literature or their previous training.

It is with this type of neurosurgeon in mind that we put on record our experience with 16 cases of tuberculoma of the brain seen in the last 10 years. With the exception of 1 case, all have been studied angiographically. A review of literature revealed that in no previous series was the angiographic aspect dealt with except in the series of Ramamurthi and Varadarajan reported recently.

The incidence of tuberculoma of the brain in different countries varies greatly and is, as to be expected, related to their social standards (Table 1).

The recent introduction of the potent antituberculosis remedies, far from diminishing the incidence of tuberculoma of the brain, is more likely to increase it. Patients who used to succumb to tuberculous meningitis will live now, under antituberculous therapy, to have development of localized tuberculoma of the brain. The situation is not unlike that of pyogenic brain abscess after the introduction of penicillin in the treatment of otitis media.

A few cases of tuberculoma of the brain will now be described, each one presenting some interesting feature.

Case Reports

Case 1. A 30-year-old woman complained of headaches and right jacksonian fits for 6 months. Her first fit started 1 week after delivery. Four weeks later she had a painless swelling of the right wall of the chest which was incised by a local physician. It refused to heal and left a discharging sinus.

Examination. There was right hemiparesis, hemihypesthesia and astereognosis of the right hand. There was no papilledema and the visual fields were normal. Plain roentgenograms were normal.

Left carotid angiography was done. The lateral view was within normal limits. The frontal view showed moderate displacement of the anterior cerebral artery towards the opposite side. No vascularity or excessive hypertrophy of the vasculature were noticed.

Operation. A small circumscribed swelling situated superficially in the cortex, 4×3 cm. in size, was removed completely with little loss of blood. The brain was not under tension.

Course. The diagnosis was made only when the pathological report was received 1 week later. Intensive antituberculous treatment was started but the patient succumbed to tuberculous meningitis 5 weeks later.
Comment. 1. This was our first tuberculoma of the brain. The tumor was superficial and adherent to the dura mater and we thought it was a meningioma. The loss of this case made an indelible impression on our minds. In all subsequent cases the diagnosis either was made or strongly suspected preoperatively or the correct diagnosis was made during the operation. The significance of a discharging sinus in the wall of the chest in a patient with fits was missed entirely.

2. This is the only patient in the series who had had no increased intracranial tension. Undoubtedly the fits forced the patient to seek advice before papilledema had time to develop.

3. Intensive antituberculous treatment started 1 week postoperatively failed to avert the development of tuberculous meningitis. This shows the extreme importance of starting antituberculous therapy either preoperatively or on the operating table.

4. The fits started 1 week after confinement. It is a common observation that tumors of the brain and spinal cord are stirred into activity by pregnancy and delivery.

Case 2. A 16-year-old boy complained of headaches, prominence of the right eye and progressive deterioration of its vision of 3 months’ duration. His symptoms started with fever which lasted for 8 days. Two weeks later he began to have headaches followed in a short time by diplopia, blurring of vision and progressive protrusion and visual deterioration of his right eye. It became completely blind in the course of 2 months. There was a feeling of numbness in the upper two-thirds of the right face.

Examination. His right eye was protruded (exophthalmometry difference of 4 mm.) and was pushed forwards and downwards. The right eye was completely blind and its pupil was dilated and fixed. There was primary optic atrophy on the right side with papilledema of D5 on the left. The oculomotor movements were restricted in every direction. The corneal reflex was present but diminished. There was painless swelling of the right temple (Fig. 1).

Course. He remained in hospital for 3 weeks prior to his operation. His temperature chart showed frequent bouts of fever ranging from 37.5°-38.5°C.

Plain roentgenograms showed destruction of the outer two-thirds of the right sphenoidal ridge. The right optic foramen was enlarged with indefinite margin.

Angiography showed remarkable dilatation of middle and anterior cerebral arteries. The sylvian group of vessels are shown in the lateral view (Fig. 2) pushed markedly upwards, and in the frontal view pushed upward and medially (Fig. 3). The anterior cerebral artery was displaced to the opposite side (Fig. 3). The site of the tumor was virtually avascular.

Operation. The temporal muscle was found swollen, boggy and infiltrated but not vascular. The line of the outer wall of the temporal fossa was thickened but not excessively vascular. The

**TABLE 1**

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Year</th>
<th>Percentage</th>
<th>Comment</th>
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<tbody>
<tr>
<td>Starr19</td>
<td>England</td>
<td>1889</td>
<td>50</td>
<td>Mostly postmortem findings in children</td>
</tr>
<tr>
<td>Bernstein et al.1</td>
<td>America</td>
<td>1950</td>
<td>1-3</td>
<td>All space-occupying lesions are treated as tuberculoma before other possibilities are considered</td>
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<tr>
<td>Asenjo et al.3</td>
<td>Chile</td>
<td>1951</td>
<td>15.9</td>
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<tr>
<td>González-Revilla7</td>
<td>Panama</td>
<td>1952</td>
<td>8</td>
<td></td>
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<tr>
<td>Arsen1</td>
<td>Rumania</td>
<td>1958</td>
<td>8</td>
<td>Emphasizes the high incidence in the young-age group</td>
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<tr>
<td>Obrador8</td>
<td>Spain</td>
<td>1959</td>
<td>4</td>
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<tr>
<td>Ramanurthi &amp; Varadarajan12</td>
<td>India</td>
<td>1961</td>
<td>20</td>
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<tr>
<td>Higazi</td>
<td>Egypt</td>
<td>1963</td>
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