Brain-stem abscess in childhood

Case report

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A rare case is reported of a solitary abscess of the brain-stem which was
suspected clinically, confirmed surgically, and successfully removed. The few
reports of similar cases in the literature are reviewed.

Key Words - brain stem - abscess

A solitary brain abscess confined
to or extending into the brain
stem is an extremely rare con-
dition and the number of published cases
are few.2-4 In 330,000 autopsies studied at
the Armed Forces Institute of Pathology,
only four solitary brain-stem abscesses were
found.6

The purpose of this article is to record a
case of a suspected brain-stem abscess
which was surgically confirmed and success-
fully removed. The size and position of the
cavity were demonstrated by preoperative
and operative radiographic procedures.

Case Report

This 8-month-old girl was transferred
from another hospital with the clinical
diagnosis of a possible brain-stem glioma.
The child had progressed normally until the
age of 3½ months when she developed
acute respiratory distress, associated with
cerebral irritation. Lumbar puncture re-
vealed evidence of a bacterial meningitis,
which was treated with ampicillin. Subse-
quently, her head started to enlarge abnor-
mally, and a ventriculogram demonstrated
gross dilatation of the lateral ventricles asso-
ciated with a brain-stem mass. This was
thought to be a glioma; a ventriculoperito-
eal shunt was performed and later revised.
The child’s clinical condition deteriorated
further and she was transferred to this hos-
pital for reassessment.

Examination. On admission the child was
in respiratory distress. The head was large.
She showed reduced responsiveness but this
was thought to be partly due to visual
impairment since there was bilateral optic
atrophy. She had a convergent squint; the
pupils were small and did not react to light.
The legs were extended in a state of
decerebrate rigidity. The anterior fontanel
was not tense and the intraventricular
pressure was not raised, so it was thought
that the valve was still functioning adequate-
ly. Cerebrospinal fluid (CSF) was sterile
and contained 47 mg% sugar, 119 mg% protein, and 15 lymphocytes. Ventriculog-
Fig. 1. Air and Myodil ventriculogram. Brow up lateral (left) and anteroposterior (right) projections demonstrating the brain-stem mass. The patent suprapineal recess is displaced upward and forward, the aqueduct is obstructed, and most of the third ventricle is obliterated by the mass.

raphy was repeated and confirmed the presence of a large space-occupying mass indenting the third ventricular floor and displacing it upward and forward. The aqueduct was obstructed and the air and Myodil could not pass into the fourth ventricle. The suprapineal recess was patent and displaced upward and forward (Fig. 1). Because of the past history of bacterial meningitis, brain-stem signs, and the CSF content of 119 mg%, which is rather high for a glioma, an abscess was considered. The presence of only 15 lymphocytes did not preclude this diagnosis, as Davidoff and Eberhard observed that the CSF may become acellular or contain only a few lymphocytes after an abscess has become encapsulated.

Fig. 2. Cystograms demonstrating size and position of abscess cavity. Left: Lateral projection demonstrating the air and contrast filled abscess cavity. Right: Anteroposterior view. Note abscess extension inferriorly on right as far as its attachment to the third nerve (arrow).
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First Operation. In view of the poor prognosis with conservative treatment, it was decided to explore the upper brain stem. The swollen left superior cerebellar peduncle was visualized, approached through the middle cranial fossa by means of a left posteroinferior temporal osteoplastic flap. This area was needled and a cyst entered at 1.8 cm; 12 cc of pus were evacuated. When this abscess was emptied, the mesencephalon collapsed to its normal position. The cavity was filled with air and stereopaque, and the needle hole sealed with some Oxycel (Fig. 2). Staphylococcus pyogenes was cultivated from the pus in abundant growth.

Postoperatively there was some improvement, especially in the conjugate eye movements, but the patient still had decerebrate posturing. Over the next few days her condition further deteriorated and in view of this a repeat exploration was undertaken in an attempt to excise the abscess.

Second Operation. The swollen left superior cerebellar peduncle was split vertically. The abscess lay symmetrically across the midline in the midbrain and extended into the upper pontine region reaching the surface anteriorly between the peduncles. It was attached to the third nerve on the right side. The lesion was detached from the third nerve and removed in its entirety except for a small fibrous extension of the capsule.

Postoperatively respiratory distress was alleviated, swallowing improved, and the patient gained weight. The squint diminished but the decerebrate rigidity remained. The bizarre symmetrical paddling movements of all the limbs that had been present preoperatively disappeared.

Discussion

The clinical diagnosis of this condition is difficult, but it should be considered in brain-stem swellings where the clinical history or CSF is suspect.

When the abscess is of metastatic origin the primary infection is probably in the lungs. Various authors stress the fact that metastatic suppuration occurs much more commonly in the distribution of the middle cerebral than that of any other intracranial arteries. This is in contradistinction to intracranial tumor metastases which have a greater predilection for posterior fossa structures. Presumably the relative invulnerability of the vertebrobasilar system accounts for the rarity of metastatic suppuration in the brainstem.

In the vast majority of reported cases, death has been rapid, occurring within 1 to 3 weeks after the onset of relevant clinical signs, except for the patient of Weickhardt and Davis who survived for 3 months. When last seen, our patient was still alive 8 months after the demonstration and drainage of the abscess. Because of its position, the abscess irreparably destroyed vital cranial nerve nuclei and tracts, and although mortality was prevented, the patient has suffered severe sequelae.

A definite preoperative radiographic diagnosis of this condition is probably impossible even with the aid of contrast radiography. Hitherto, the diagnosis has been made only at autopsy. Therefore, to the best of our knowledge, this is the first time that an abscess cavity in this region has been demonstrated radiographically at operation.

This case is instructive since it stresses that not all brain-stem swellings in children are necessarily gliomas and the possibility of other causes should always be entertained.

References


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