LOCALIZATION OF $^{99m}$Tc IN THE CHOROID PLEXUS

OF THE FOURTH VENTRICLE

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Choroid plexus localization of $^{99m}$Tc-pertechnetate in the fourth ventricle was noted in two patients in the lateral and posterior brain scans. This localization was blocked by potassium perchlorate on subsequent scanning. Such localization in the fourth ventricle could be mistaken for a midline posterior fossa tumor.

Witkofski (1) and Webber (2) reported the localization of $^{99m}$Tc-pertechnetate in the choroid plexus of the lateral ventricles in 1965. The purpose of this paper is to describe two cases that show the visualization of the choroid plexus in the fourth ventricle and to point out the problems in differential diagnosis.

CASE REPORTS

Case 1. M.P., a 59-year-old white housewife, has been seen frequently at the University of Iowa Hospitals. She first presented in 1962 with a diagnosis of carcinoma of the cervix, Stage I. She was treated with radiation therapy with no known recurrence over the next ten years. She was subsequently seen for postirradiation proctitis, hypothyroidism, arteriosclerotic heart disease, and diabetes mellitus with neuropathy and myelopathy. Her most recent hospitalization was in June 1972. She had been bedridden for the past two years because of the neuropathy and myelopathy and had developed decubitus ulcers. The patient had three seizures during this hospitalization and EEG and brain scan were obtained.

The EEG revealed no focal abnormality. A brain scan done 2 hr after injection of $^{99m}$Tc-pertechnetate showed activity in the choroid plexus of the lateral ventricles. Activity was also seen beneath the anterior end of the transverse sinus in the lateral views; this activity was noted midline at the base of the posterior fossa in the posterior view (Fig. 1, top row). The brain scan was repeated with potassium perchlorate and the previously seen localized activities were blocked (Fig. 1, bottom row). The brain scans were therefore interpreted as normal. No further studies were carried out and the patient was placed on diphenylhydantoin for her seizure disorder.

Case 2. K.B., an 8-month-old white girl, was admitted to the University of Iowa Hospitals because of failure to thrive. She was unable to hold up her head. The circumference of the head was normal for the child's age but it was large in relationship to the body size. She had generalized hypotonia.

Cultures of the throat, blood, and CSF were negative. Skull films revealed slight sutural spreading.

Received Oct. 27, 1972; original accepted Dec. 7, 1972.
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FIG. 1. Top row of two lateral and one posterior scans shows activity in choroid plexus of lateral ventricles. Activity is also seen beneath anterior end of transverse sinus in lateral views; this activity is noted midline at base of posterior fossa in posterior view (arrows). Three bottom scans were obtained after potassium perchlorate. Note blocking of choroid plexus activity.
The x-rays of the long bones were interpreted as normal and the chest film showed slight scoliosis with no other abnormalities. The EEG showed abnormal paroxysmal slow irregular spikes and sharp waves in both temporal regions. Ventriculogram revealed the ventricles to be normal in size and in communication with the subarachnoid space. There was some cortical atrophy of the frontal lobe.

A brain scan done 2 hr after injection of $^{99m}$Tc-pertechnetate revealed activity in the choroid plexus of the lateral ventricles. Activity was also seen beneath the anterior end of the transverse sinus on the lateral views. This activity was noted at midline to the base of the posterior fossa in the posterior view (Fig. 2, top row). A repeat brain scan with potassium perchlorate showed blockage of the localized activity including the activity in the midline posterior fossa (Fig. 2, bottom row). The brain scans were interpreted as normal and the final diagnosis was failure to thrive on the basis of environmental deprivation.

DISCUSSION

Choroid plexus are present in all four ventricles but only the plexus in the lateral ventricles have been reported as showing on $^{99m}$Tc-pertechnetate brain scans. The problems of differential diagnosis, descriptions of the characteristic configuration, and the mechanism of localization have been presented in the literature (3–5).

These two cases show the visible uptake of $^{99m}$Tc-pertechnetate in the choroid plexus of the fourth ventricle in the lateral and posterior views where this appearance of uptake could be misconstrued as a midline posterior fossa tumor. This is not a common observation and it could be a potential source of error in brain scan interpretation unless the examiner is aware of the existence and the appearance of this finding.

A midline posterior fossa tumor, situated in the fourth ventricle, could easily resemble the two cases reported. The fact that the choroid plexus of the lateral ventricles are also visualized indicates that the additional activity noted midline in the posterior fossa might be the choroid plexus of the fourth ventricle. The only way to differentiate between the two is to repeat the brain scan after premedication with potassium perchlorate. This problem, of course, would not be present in laboratories which premedicate routinely with potassium perchlorate.

The occipital sinus is also situated midline in the posterior fossa in a high percentage of cases, as shown by a recent study (6); however, one can usually exclude it in the differential diagnosis because this structure is seen only in the posterior view of the brain scan.

REFERENCES