

## Imaging of the Choroid Plexus with Prior Administration of Sn(11)-pyrophosphate

A. KOMATANI\*, K. YAMAGUCHI\*, K. UEMURA\*\*

\**Department of Radiology, Yamagata University, School of Medicine, Yamagata*

\*\**Department of Radiology, Research Institute of Brain and Blood Vessels, Akita*

A clear image of the choroid plexus was obtained unexpectedly in a brain scintigraphy by  $^{99m}\text{Tc}$ -pertechnetate, 24 hours before which a bone scintigraphy had been performed using  $^{99m}\text{Tc}$ -pyrophosphate. If RI-imaging of the ventricular system become possible, its information must be very useful for the diagnosis of the brain. This situation led us to investigate the intentional imaging of the choroid plexus by prior administrations of Sn(11)-pyrophosphate.

(Method) Prior administration of Sn(11)-pyrophosphate used in radiopharmaceutical preparations was made. Three to forty eight hours later,  $^{99m}\text{Tc}$ -pertechnetate was injected and from this time the sequential image of the brain was stored into a data recorder system with a gamma camera. Thereafter, time course of the RI accumulation in the choroid plexus was analyzed.

(Result and discussion) The peak of count rate in the choroid plexus was noted between the range from 60 to 90 min after  $^{99m}\text{Tc}$ -pertechnetate

injection. The count rate ratio of the choroid plexus to the outside region increased gradually and reached plateau about 120 to 180 min after the injection. In such a time range we can get the clearest image of the choroid plexus.

The mechanism of the selective concentration of  $^{99m}\text{Tc}$ -pertechnetate to the choroid plexus with prior administration of Sn(11)-pyrophosphate is still obscured. But, we may consider that the tin in the pyrophosphate accumulate at first into the choroid plexus and then the tin collects the  $^{99m}\text{Tc}$ -pertechnetate by reducing process.

Clear image of the choroid plexus is very effective to detect the displacement of the ventricular system of the brain. Especially, it is useful for the diagnosis of some space-occupying lesions which are not visualized by ordinary scintigraphy only with  $^{99m}\text{Tc}$ -pertechnetate administration. Actual clinical cases were also presented to show the advantage of our method.

## Clinical Evaluation of Radioimmunoassay for Astroprotein in Cerebrospinal Fluid

Akira MATSUMOTO\*, Tatsuro AKIOKA\*, Shuzo OKUMURA\*, Shojiro OKAO\*\*  
and Kousuke OHTA\*\*

\**Neurosurgical Service, National Hospital in Okayama*

\*\**Neurosurgical Service, Fukuyama Ohta Hospital*

Mori et al. (1970) revealed an astrocyte-specific cerebroprotein and designated it as astroprotein. They also established the radioimmunoassay method for measuring astroprotein in cerebrospinal fluid and reported that this technique might be applicable as a screening test for glioma. At the same time there is a possibility astroprotein in cerebrospinal fluid may be increase following cerebral tissue damage, because it exists in a fibrillary astrocyte of normal brain. The purpose of the present study is to detect astroprotein in cerebrospinal fluid by radioimmunoassay, attempting to

clarify the diagnostic value of astroprotein for cerebral tissue damage. A hundred patients with head injuries as well as other non-tumor diseases has been examined and the following results were obtained:

1) Astroprotein in cerebrospinal fluid from patients of control group without organic cerebral tissue damages, such as cervical spondylosis, Mènière's disease, neurosis and so on, was found generally under 30 ng/ml.

2) Astroprotein in cerebrospinal fluid from patients with cerebral concussions was also found

under 30 ng/ml.

3) Remarkably high amounts of astroprotein were detected in patients with cerebral contusions, cerebral hemorrhages and acute subdural hematomas.

4) Serial measurement of astroprotein in cerebrospinal fluid showed it reached to the maximum value within several hours after cerebral damage and then gradually decreased to the control

value in 7–14 days.

From these results, it might be concluded that measuring astroprotein in cerebrospinal fluid is clinically valuable in the cases with cerebral tissue damages as an examination not only for making diagnosis but also for evaluating the grade of tissue injuries and the prognosis.

### **Re-examination of Regional Time-activity Curve with $^{99m}\text{Tc}$ -Pertechnetate in Cerebral Disease**

K. HORIBE\*, K. AKAGI\*, T. IKEDA\*\*, T. KONDO\*\*, M. HAYASHI\*\*\*, K. KUSUMI\*\*\*, S. TAKEDA\*\*\*\* and M. KAWANISHI\*\*\*\*

*\*Department of Neurosurgery, Osaka National Hospital*

*\*\*Department of Neurosurgery, Osaka University*

*\*\*\*Department of Radiology, Osaka University*

*\*\*\*\*The Institute of Scientific and Industrial Research*

Several parameter which reflect changes in regional circulation has been measured. Regional cerebral circulation is commonly evaluated by imaging the first transit of  $^{99m}\text{Tc}$ -pertechnetate, a relatively nondiffusible radiotracer, following an intravenous bolus injection, because of simplicity and safety as screening test for an out-patient.

Wagner et al. reported that the mean transit time (MTT) of ROIs can not be determined from the T/A curve because the shape of the T/A curve is a function of the physical shape of bolus of radiotracer as it enters the ROI as well as its mean transit time through the ROI.

The time in the ROI from injection to positive and negative peak by differentiating the T/A curve were measured. (MAT, MDT).

Difference of MAT, MDT were measured for each cerebral hemisphere as linear index of MTT whereas the detection of bolus division in the aortic arch was difficult clinically (dMAT, dMDT). (Methods)

A-gamma-camera interfaced to computer was used to monitor the head from vertex position. Data frame were accumulated at a rate of 1/sec for about 50 sec after injection by Oldendorf's method.

Thirty cerebral dynamic records were studied in 11 patients with brain tumor, 19 patients with cerebrovascular disease.

#### **(Results)**

dMAT (difference of Mode of Appearance time) increased in the group of cerebrovascular disease in affected hemisphere except one patient.

dMDT (difference of Mode of Disappearance time) increased in the group of brain tumor in affected hemisphere except one patient.

Ratio of abnormal/normal relative volume from equilibrium count increased only the group of brain tumor. The parameter (dMAT, dMDT) presents very useful additional information to other routine examination for the screening and following study of the clinical case.