TRANSAXIAL TOMOGRAPHIC OBSERVATION OF REGIONAL CEREBRAL BLOOD FLOW (rCBF) IN THE PATIENTS WITH ISCHEMIC CVD BY Kr-81m AND HEADTOME. K. Uemura, S. Takahashi, T. Kawata, T. Kanno, S. Miura and Y. Miura, Division of Radiology, Research Institute of Brain and Blood Vessels, Akita.

Three diemntional regional cerebral circulation can be evaluated by tomographic imaging using the Headtome and continuous intracarotid infusion by Kr-81m solution. Modern imaging of rCBF in the patients with ischemic CVD: Seventeen patients with ischemic CVD were studied. The results: 1) the advantage of the method was visualization of 3-D-rCBF distribution in the brain with excellent spatial resolution; 2) distribution of ischemic areas observed clearly on all the subjects; 3) the study consistently detected hypoperfusion in the broad zone that appeared to be structurally normal.

II. Calibration of mean rCBF by the Kr-81m clearance study: One of the disadvantage of the Kr-81m infusion method has been considered that the method did not provide any flow value of the brain. For the relationship curve between Kr-81m counts of the brain tissue and the rCBF, average ECT value of the whole slices is calibrated by the mean hemispheric CBF which is obtained by the intracarotid injection. With the calibration, rCBF value of the each pixel of the Kr-81m ECT is estimated. Quantitative tomographic mapping of rCBF on the patients with CVD were presented.


A cerebral positron CT system (Positologic) was used for obtaining tomographic brain images following intravenous injection of N-13-ammonia and inhalation of C-11-carbonmonoxide. The images of normal volunteers revealed high accumulation of N-13-ammonia in gray matter and a little uptake of N-13-ammonia in white matter. Large vascular structures of the brain were clearly seen in tomographic images with C-11-carbonmonoxide gas. Deficit of N-13-ammonia images obtained from a patient with old cerebral infarction appeared to be larger than the low density areas on the XCT image. The images of a patient with cerebral infarction revealed high accumulation of N-13-ammonia in the lesion. This finding probably showed "luxury perfusion syndrome" in the case of meningioma N-13-ammonia was markedly taken up. The reduced uptake of C-11-carbonmonoxide was in the center of the tumor, though the high uptake of C-11-carbonmonoxide was in the peripheral region of the tumor. From these preliminary results, it is suggested that tomographic images of N-13-ammonia and C-11-carbonmonoxide provided the pathological information about hemodynamics.