spinal tap (9%) and images of leakage (13%) were observed even in the successful cases of cisternography. The fact indicates that the factor of the patient himself described in (3) plays much higher role than appeared in the figure.

(5) Follow up study of same cases showed 3 types, such as continuously successful cases (A), mixed cases (B) and continuously unsuccessful cases (C). There found no specific reason and difference between these groups. As one of important reasons for the unsuccessful cisternography, technical factor plays some important role as weas indicated in the follow up studies which showed as much as 11 cases out of 30 had both successful and unsuccessful results in short interval studies.

(6) Continuously unsuccessful cases were only 4 cases. It is important that the needle of spinal tap should be inserted precisely into the subarachnoidal space. The cases with images of leakage or malinfusion should be examined further. Even in the unsuccessful case reexamination with some interval should be performed since frequent successful second examination can be expected.

Radionuclide Examinations of Ventricular Atrial or Ventricular Peritoneal Shunt Examination of Patency, Blocked Site and Cerebrospinal Fluid Flow Rate

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A small volume of $^{99m}TcO_4^-$ was injected into the reservoir and scintiphoto was taken after few minutes with polaloid camera. When shunt was patent, the photo showed the radioactivity in the reservoir and didtal tube. In obstructed case, radionuclide in the reservoir was flushed by digital pressure or reinjection of saline. We examined the possibility of csf withdrawal from the reservoir, too. When distal tube was block, the photo after flushing showed ventricular tube in Rickham Holter system, and only reservoir in Pudenz system. Csf was easily withdrawed into syringe, too. When ventricular tube was block, photo after flushing showed distal tube in each type, and csf was not withdrawed.

We performed phantom experiments to determine csf flow rate through the shunt system, Rickham Holter system and Pudenz system. In the first experiment, flow rate was set by siphon, and in the second one, flow rate was set by infusion pump. Radioactivity clearance half time at the reservoir and flow rate showed linear relationships on double-log scale in each experiment. The data of the second experiments are shown. In Rickham Holter system, the regression equation is $\log_{10}(F) = -1.8 \log_{10}(T1/2)$, and the experimental variation is $-1.9 \log_{10}(T1/2) - 0.03 \leqq \log_{10}(F) \leqq -1.7 \log_{10}(T1/2) + 0.02$. In Pudenz system the regression equation is $\log_{10}(F) = -1.3 \log_{10}(T1/2) + 0.086$, and the variation is $-1.26 \log_{10}(T1/2) - 0.047 \leqq \log_{10}(F) \leqq -1.26 \log_{10}(T1/2) + 0.1$. These data of the second experiment are almost same values as that of the first one.

Correlation with Radionuclides Cisternogram and Computed Tomogram

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With a use of computed tomography, the morphological informations of the ventricles, basal cisterns and cerebral sulci can be easily obtained. On the other side, radionuclides cisternography is an excellent method to know the flow of the cerebrospinal fluid. In this study, radionuclides