

## Using the spleen for time-delay correction of the input function in measuring hepatic blood flow with oxygen-15 water by dynamic PET

Hiroki TANIGUCHI, Akihiro YAMAGUCHI, Satoshi KUNISHIMA,  
Toshimori KOH, Mamoru MASUYAMA, Hiroshi KOYAMA,  
Atsushi OGURO and Hisakazu YAMAGISHI

*First Department of Surgery, Kyoto Prefectural University of Medicine*

By the spleen, we calculated a time-delay correction of the input function for quantitation of hepatic blood flow with oxygen-15 water and dynamic positron emission tomography. The time delay ( $\Delta t$ ) between the sample site and the spleen was calculated based on nonlinear multiple regression analysis when splenic blood flow was determined. Then hepatic blood flow was quantified by a method using the input function and incorporating  $\Delta t$ , which was assumed to be equal to the time delay between the sample site and the liver. Then hepatic arterial and portal blood flows were estimated separately as well as the delay time for passage within the organs of the portal circulation. The mean coefficient of variation and the mean sum of squares of errors decreased to about 70% when total hepatic blood flow was calculated from the results for regions of interest in three slices of the same liver segment. We concluded that using the spleen for time-delay correction of the input function for measuring hepatic blood flow by this method gave satisfactory results.

**Key words:** regional hepatic blood flow, oxygen-15 water, positron emission tomography, spleen