

Evaluation of breath-hold ^{201}Tl SPECT in the differential diagnosis of solitary pulmonary nodules

Tsuyoshi KOMORI,* Isamu NARABAYASHI,* Masuo HAYASHI,* Shoji HORIUCHI,** Itaru ADACHI,*
Yasuharu OGURA,* Hitoya OHTA* and Keita UTSUNOMIYA*

*Department of Radiology, Osaka Medical College

**Department of Radiology, Osaka City Juso Hospital

The aim of this study was to evaluate the usefulness of deep inspiration breath-hold SPECT (BrST, a method for ^{201}Tl SPECT) in the diagnosis of solitary pulmonary nodules (SPN). **Methods:** Ten patients with malignant lesions and five with benign lesions were enrolled in this study. Early SPECT acquisition was performed 15 min after injection of ^{201}Tl , while delayed SPECT images were acquired 3 h after injection. The first 15-sec acquisition was done using the BrST technique, and the second with the conventional free breathing (FB) method. We performed this technique alternately, and therefore, the odd data were from BrST and the even data were from FB. We referred to the T/N ratio of the early images as the ER and to the T/N ratio of the delayed images as the DR. To semi-quantitatively evaluate the degree of retention in the lesion, the retention index (RI) was calculated. **Results:** The RI of BrST indicated greater accuracy than that of FB in the differential diagnosis of SPN. For the benign and malignant lesions, the RI of BrST was -3.07 ± 31.51 and 29.86 ± 25.01 , respectively ($p < 0.05$). The sensitivity, specificity, and accuracy of BrST (80%, 80%, and 80%, respectively) were significantly higher than those of FB ($p < 0.05$). **Conclusion:** The BrST method is more accurate than that of the conventional FB method in the differential diagnosis of SPN.

Key words: thallium-201, solitary pulmonary nodule, breath-hold