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STUDY OF METHOD FOR COMPARISON OF DISTRIBUTION OF 111 IN–DTPA IN CISTERNAL SPECT (USEFULNESS OF METHOD EMPLOYING SEGMENTED DISTRIBUTION CURVES)

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Cisternal SPECT employing 111In–DTPA was performed on patients with hydrocephalus. Conventionally, the method for evaluating cisternoscintigrams has involved determining the count for the whole image and preparing a clearance curve, which was then evaluated. In the present study, we employed a 3-head gamma camera, and, in order to evaluate the intracerebral distribution of 111In–DTPA from reconstructed transverse images, we established the following regions of interest (ROI): The counts in each of the segmented ROIs were shown on a distribution curve prepared for each ROI. Intracerebral distribution curves were prepared in the same manner with the passage of time, and we then investigated the usefulness of this approach as a method for evaluating the intracerebral distribution of 111In–DTPA.

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Dynamic Pulmonary Xenon-133 SPECT in Patients with Lung Cancer. K. Shimizu, K. Suga, K. Nishigauchi, N. Kume, K Takano, S. Koike, T. Matsumoto, N. Matsunaga. Yamaguchi University, Ube, Japan.

We investigated the utility of dynamic pulmonary xenon-133 SPECT for evaluating regional ventilation abnormality in 33 patients with lung cancer.

Following rebreathing of xenon-133 gas, equilibrium and washout SPECT during spontaneous breathing were acquired every 30 sec for 5-7 min, using triple-detector system (GCA 9300 A/HG, Toshiba) with the continuous repetitive rotation acquisition mode. Regional xenon-133 washout was assessed by the real half-time (T1/2) and mean transit time (MTT) images.

Xenon-133 retention adjacent to the tumors was more intensive in central-type tumors than in peripheral-type tumors, with significantly prolonged clearance-time (T1/2: 221.1 ± 127.5 sec, n=21 vs. 73.2 ± 7.9 sec, n=12; P< 0.01). Other retention was also seen in the remaining lungs in 15 patients, which reflected emphysematous change or bronchiectasis. Superimposition of functional image of mean transit time and chest CT offered better localization of ventilatory abnormalities, with or without abnormalities on CT. Follow-up SPECT quantified improved ventilation by radiotherapy.

This new modality is valuable to detect ventilation abnormalities in patients with lung cancer.

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COMPARATIVE STUDY OF XENON-133 GAS DYNAMIC SPECT AND HIGH-RESOLUTION CT IN PULMONARY EMPHYSEMA.
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To assess the usefulness of Xenon-133 dynamic SPECT (Xenon SPECT) by comparing Xenon-133 washout axial images with high-resolution CT (HRCT) in patients with pulmonary emphysema. Thirteen patients inhaled 370 MBq Xenon-133 and held their breath for 15 seconds. Xenon SPECT images were obtained continuously every 60 seconds for 6 minutes. Retention time of Xe-133 greater than three minutes during washout imaging was considered abnormal. Xe-133 functional maps (T1/2 , MTT) were made from axial images. In all patients, more detailed information was obtained using Xenon SPECT than using HRCT. In some patients, there were significant correlations between CT number and T1/2 and MTT. Xenon SPECT was more effective than HRCT in assessing the extent of pulmonary emphysema.

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ASSESSMENT OF CORONARY FLOW RESERVE BY DIPYRIDAMOLE THALLIUM–201 IMAGING IN PATIENTS WITH KAWASAKI DISEASE: COMPARISON OF PERFUSION AND CORONARY ARTERY ANEURYSM SIZE.
Morita, and N. Hayabuchi. Kurume University School of Medicine, Fukuoka, Japan.

To evaluate coronary flow reserve, myocardial washout rate of thallium–201, and the relationship of perfusion defects to coronary aneurysm size in children with Kawasaki disease. Children with Kawasaki disease can develop myocardial ischemia. Fifty-four children with Kawasaki disease were studied by thallium–201 tomography and compared to 10 control subjects. The children were divided into four groups: group I had significant coronary stenosis; group II had coronary artery aneurysms without stenotic lesions; group III had regressed coronary aneurysms with angiographically normal coronary arteries ; and group IV had angiographically normal coronary arteries and never had an aneurysm. Coronary aneurysms were classified into three groups; giant aneurysm, coronary aneurysm, and regressed coronary aneurysm. Myocardial perfusion defects were identified in 15 of 20 patients in group I and 2 of 18 patients in group II. Global thallium–201 clearance was 60.8+3.7% (n=10) in the control group, 39.6+7.2% (n=20) in group I, 51.2+4.2% (n=18) in group II, 52.0+8.3% (n=6) in group III, and 52.9+3.1% (n=10) in group IV. Clearance was significantly different between the control group and group I (p<0.001), groups I and II (p<0.001), and group IV and the control group (p<0.01). In comparing the types of coronary artery aneurysms, only giant aneurysms showed perfusion defects. Our data suggest that the myocardial-bed thallium clearance does not identify abnormal distal coronal flow reserve in established, progressive or regressed coronary aneurysms, despite the presence of a proximal epicardial abnormality. We found that only giant aneurysms had perfusion defects.