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STUDIES OF VENTILATION AND PERFUSION IN RABBITS WITH EXPERIMENTAL PULMONARY EMBOLISM. I. Narabayashi, H. Terashima, S. Yanagimoto and Y. Ito Department of Radiology, Kobe University Hospital and Division of Nuclear Medicine, Kawasaki Medical School. Kobe and Kurashiki

Ventilation and perfusion studies were performed on 48 rabbits with experimentally produced multiple pulmonary emboli formed from thrombin, lipiodol ultrafluide, gelfoam, ivalon, iron powder and VX-2 cancer. The emboli of thrombin and lipiodol had completely disappeared from perfusion images after 24 hours. Those from combined injection of ivalon and iron powder persisted perfusion defects scintigraphically after 24 hours. Immediately after the embolization, Xe-133 washout study was begun with the intravenous injection of dissolved xenon. Thereafter, perfusion images were obtained using Tc-99m MAA. In areas of absent blood flow temporary abnormality of ventilation was detected as delayed xenon clearance, showing bronchoconstriction. In rabbits with diffuse oily microemboli, the washout studies after equilibrium breathing of xenon gas demonstrated remarkable delay in clearing the gas from the whole lung. Perfusion images showed the fissure sign as a linear area of decreased radioactivity which corresponds to the interlobar fissure.

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PULMONARY PERFUSION IMAGE IN VENTRICULAR SEPTAL DEFECT: EVALUATION IN CONSIDERING PULMONARY HYPERTENSION. F. Nakanishi, T. Kasuga, T. Kobayashi, H. Sida, K. Inokawa, S. Takamoto and K. Hirano Department of Radiology, Department of Surgery, Technological Service of Radiology, Shinshu University School of Medicine. Matsumoto

Eighty six patients with ventricular septal defect were classified into three groups according to the grade of pulmonary arterial pressure. Group 1; $P_p/P_s < 0.45$, group 2; $0.45 \leq P_p/P_s < 0.75$, group 3; $P_p/P_s \geq 0.75$. Left/Right ratio was calculated in computer processing image of posterior view.

Decreased perfusion of the left lung was seen in 24 of the 31 cases of group 3, in 13 of the 24 cases of group 2 and in 2 of the 31 cases of group 1. Bilateral irregular accumulation and perfusion defects were observed in patients with P_p/P_s ratio ≥ 0.6 . An inverse correlation was found between P_p/P_s ratio and L/R ratio in 42 patients with P_p/P_s ratio < 0.6 . In 44 patients with P_p/P_s ratio ≥ 0.6 , the correlation was poor.

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SCINTIGRAPHIC DIAGNOSIS OF PULMONARY EMBOLISM. N. Uehara, J. Fujioka, M. Shigeyasu, O. Doi, K. Mitsudoh, K. Ohnaru and K. Ueda Department of Surgery, Radiology and Internal Medicine, Kurashiki Central Hospital, Kurashiki

Perfusion lung imaging is a safe and simple means of detecting pulmonary embolism (PE). We experienced 9 cases of PE in the past three years. Two were complicated with pulmonary infarction. In 7 out of 9 cases, emboli were located in more than two lobes. Perfusion defects were segmental or subsegmental, triangular in shape, and distributed in all lobes, most frequently in LLL, and RML. Additional embolus was found in 4 cases. Kr-81 studies of regional ventilation and close observation of chest X-rays revealed little or no change in the area of perfusion defects, except in that of pulmonary infarction.

A retrospective analysis was performed in 52 patients who presented obvious perfusion defects in MAA-TC-99m studies. Though segmental or segmental-like defects were recognized in various diseases, meticulous observation of X-P disclosed abnormal shadow which matched the perfusion defect. Asthma, bronchial stenosis and some of COPD, fibrotic change, small bulla and hilar tumor showed only slight change in X-P, but disclosed V/P match. Aortitis syndrome, Becet disease and peripheral PS showed V/P mismatch, and could not be distinguished from PE by scintigraphic examinations.

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ESTIMATION OF POSTOPERATIVE RESPIRATORY FUNCTION BY PERFUSION SCAN. T. TAKAO, T. KITANO, Y. FUKUNAGA, T. NAKASUJI, S. KIMURA, K. FUKUDA AND A. ICHINOSAWA Osaka Prefectural Habikino Hospital.

We studied whether postoperative ventilatory functions, such as FVC, %VC, FEV_{1.0} and FVE_{1.0}%, of lung cancer cases can be predicted by estimation of perfusion scanning. Perfusion scintigrams were obtained with scinticamera after intravenous administration of 2mCi TC-99m MAA. The scintigram was divided into four ROI's by median line and by horizontal line at the height of 3rd intracostal space. Estimation was made by counting each ROI and following calculation:

predicted FVC etc. = observed FVC etc.

$$x \left[1 - \frac{\text{counts of ROI (region of operation)}}{\text{total count}} \right]$$

Predicted ventilatory functions were compared with those observed in every cases of pneumonectomy or lobectomy. Both values were coincident significantly. As a result of these observations, we see that our estimation for the postoperative respiratory functions by perfusion scan is clinically available.