deposition in lung field. The mixed type is madara + bronchial type.

Pulmonary function tests were perceived, the lung-field type is normal, the bronchial type is % F E $V_{1.0}$ reduced and respiratory resistance increased, the mixed type is as same as the bronchial type, the madara type is % F E $V_{1.0}$ reduced but respiratory resistance is normal or increased.

Normaly aerosols easily pass through air ways, but increasing respiratory resistance and decreasing % F E $V_{1.0}$ make the madara type and bronchial type.

By comparison, ^{99m}Tc aerosols and ^{133}Xe gas inhalation scintigram are similar each others, in the lung-field Type, but are different in the rests. These differences are supposed to be made by stratifiction of ^{133}Xe gas and viscosity of ^{99m}Tc aerosols particles.

Dynamic Pulmonary Function Study Using a Simultaneous Double Tracer Method

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We used a simultaneous double tracer technique with ^{133}Xe-solution and ^{131}I-MAA in detecting various pulmonary diseases in a total of 37 cases.

From serial scintiphotographic images and VTR computor on line system we detected different pulmonary function disorders.

We discussed the significance of this double tracer technique.

With the patient in a supine position, 300 μCi ^{131}I-MAA and 3 mCi ^{133}Xe-solution with a one-shot-injection technique was injected simultaneously.

The lung images were obtained from the Anger camera with diverging collimator of 1000 holes, storing the findings on the computor system in a form of 128 × 128 matrix.

From the image of ^{131}I-MAA perfusion scan, ^{131}I-MAA uptake curve and perfusion index (K pa) were calculated.

Moreover from the computor scintiphoto (50 × 50 matrix), the distribution of the radioactivity was known using the histogram display method.

On the other hand, ^{133}Xe images were obtained in a form of perfusion and ventilation.

Using the "region of intrest" technique, regional pulmonary ventilation function was calculated from the regional ^{133}Xe wash out half time.

Compared with the single injection method of ^{133}Xe, this simultaneous double isotope tracer technique with ^{131}I-MAA has the advantage of detecting the regional pulmonary diffusion function.