ship were found between lung scan and operability.

1) In 18 cases whose lung scans showed areas of diminished or absent activity confined to single segment same as were expected from chest x-ray film, results of surgery were all radical.

2) On the other hand, in cases demonstrating diminished or absent activity in lung scan extended to other segments or lobes than were expected from chest x-ray film, all but one of 11 surgical operation was palliative or exploratory.

Above-mentioned results show lung scan can indicate well the extent of invasion of lung cancer into the mediastinum. This is the important problem worth while to be studied in more details.

Even if the isosensitive scanner is not available, conventional scans are also useful for the comparison with x-ray film provided that anterior, posterior and lateral scans are interpreted together.

The Changes of Pulmonary Perfusion Before and After Pulmonary Resections

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Pulmonary resection is always associated with a loss of pulmonary function of varying magnitude. It is important in postoperative management to understand the postoperative changes in pulmonary function, especially the changes in pulmonary blood flow distribution. We studied the changes in pulmonary perfusion in preoperative and immediate and distant postoperative periods by means of pulmonary scintiscanning using ^{131}IMAA.

The subjects of our study consisted of 16 cases of pulmonary resections. Preoperative scanning was done with the patient in a supine position and a 200 to 250 μCi of ^{131}IMAA was injected intravenously. Immediate postoperative study was performed in the same position on the second postoperative day using 100 μCi of ^{131}IMAA. On the second postoperative day the blood flow on unaffected side showed a relative increase of 13.3%, whereas the blood flow on the operated side of the lung showed an average decrease of 19%, with the magnitude of decrease depending on the amount of lung resected. Lobectomy cases showed relatively larger decrease in perfusion. On unaffected side the postoperative increase of perfusion was generally more marked in upper lung field (mean increase 31.2%), whereas the perfusion in the lower lung field even showed a slight decrease.

When pulmonary perfusion in a distant (1 to 2 months) postoperative period is studied the perfusion on the healthy side showed a decline from 64.6% in immediate postoperative period to 58.7%, whereas the perfusion on the operated side increased from 35.5% in immediate postoperative period to 41.3% in distant postoperative period. Perfusion ratio of upper/lower lung fields on the healthy side was 0.73 in immediate postoperative period; in the distant postoperative period immediate postoperative period; in the distant postoperative period it was 0.57 and it approximated the preoperative value.

We believe the postoperative decrease of pulmonary perfusion is due to a ventilatory insufficiency of the remaining lung and resultant local hypoxemia, which in turn cause a vasoconstriction of pulmonary vascular bed

and an elevation of the vascular resistance. The elevation of vascular resistance on the operated side causes a shift of pulmonary blood flow to unoperated side, and a more marked increase of perfusion in the upper lung field is thought to indicate that the reserve of pulmonary vascular bed is present more in the upper lobe. Thus the pulmonary circulation in immediate postoperative period is characterized by an organic decrease of pulmonary vascular bed due to pulmonary resection and a functional decrease of pulmonary vascular bed in the remaining lung due to insufficient ventilation. From these results it became clear that the study of pulmonary perfusion utilizing pulmonary scintiscanning is useful in evaluating local changes of pulmonary function including ventilation.

Comparative Study of Various Scannings by Means of Selective Injection of RI into the Bronchial Artery

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Purpose:

Since collateral circulation are often formed between the pulmonary circulatory system and bronchial system in cases of chronic pulmonary disease including lung cancer, it was intended to see how these collateral circulation would change when various scannings are made.

Method:

Selective bronchial angiography was followed by temporal scanning by means of placing detectors on the lesion and other regions, and then by pulmonary scintigraphy. The findings were compared with the findings of pulmonary scintigram by means of venous injection and with the findings of angiography including cine and VTR. The apparatuses used in this study were Shimazu's Sintiscanner Model 102 and Nippon Musen's Renogram Apparatus.

Results:

It was already reported at 7th Annual Meeting of the Japanese Society of Nuclear Medicine that collateral circulation are formed between the pulmonary circulation and systemic circulation mainly rapresented by the bronchial artery in cases of chronic pulmonary diseases and that the defect of pulmonary scintigram by means of venous injection of ^{131}I-MAA was verified not to be occlusion but to be shunt from the bronchial artery to the pulmonary artery by pulmonary scintigram by means of injection of ^{131}I-MAA into the bronchial artery and by bronchial angiography (including cine and VTR).

In the present study, temporal scanning by means of injection of RIHSA into the bronchial artery was performed for the cases of same diseases and with the curve thus obtained the time of descent from the peak to the half way of asymptole was measured. As compared with that in normal regions, the time of descent was reduced in two out of four cases with large collateral circulation (shunt from the bronchial artery to the pulmonary artery) but contrarily it was elongated in three out of five cases with tumor stain. Moreover, remarkable elongation in time of descent was noted in a case of congenital heart disease with right to left shunt.