

A SCINTIGRAPHIC STUDY OF POSTOPERATIVE DEVELOPMENT OF PULMONARY FUNCTIONS IN INFANTS AND CHILDREN WITH BOCHDALEK'S HERNIA AND VARIOUS SURGICAL LUNG DISEASES.

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Postoperative changes of pulmonary functions in Bochdalek's hernia and various surgical lung diseases of infants and children were investigated by scintigraphy using ^{131}I MAA, $^{99\text{m}}\text{Tc}$ MAA, $^{81\text{m}}\text{Kr}$ gas and ^{133}Xe solution. In 11 cases with Bochdalek's hernia, radiographical improvement was seen from 5th to 12th postoperative days, however, improvement of alveolar bed seemed to require months or more, and that of vascular bed seemed to require much longer period. Perfusion-ventilation scintigraphy using ^{133}Xe solution performed at various period of 15 days to 5 years after the surgical correction showed almost equal rate of washout in both lungs. This fact suggested that initially un-aerated or markedly hypo-aerated small lung could develop normally in relatively short period after surgical correction of hernia. In 12 cases with lobectomy or segmental resection, two different courses of postoperative development were observed. In a group those lung resection was performed during infancy and early childhood, relatively rapid improvement of vascular bed was observed from immediately after the surgery. While in a case whose lung resection was performed at 6 years of age, no apparent improvement of vascular bed took place during the observation period of 3 years. This fact suggested that the age is an important factor to anticipate the future development of the pulmonary function after the surgical procedures.

STUDIES ON THE METHOD TO DETERMINE THE PULMONARY BLOOD VOLUME IN HEART-LUNG MODEL, WITH USE OF "RI ANGIOCARDIO-GRAPHY".

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It is clinically important to determine the pulmonary blood volume (PBV). PBV has been usually obtained with use of invasive techniques, but this approach is occasionally impractical and repeated measurements are not feasible especially in seriously ill patients. To obliterate these disadvantages, as the first step to the clinical use, we attempted to obtain "PBV" in heart-lung model by use of noninvasive method, "RI angiocardiology". Following results were obtained. (1) Calculated volume ($\Delta\text{MTT} \times \text{Flow}$) was consistently in agreement with the actually measured volume with error less than 2%. (2) Peak to peak time (PPT) of large area of radiocardiogram was almost identical with the MTT from the pulmonary origin to left atrium.