showed little difference in their pulmonary blood flow.

6. In experimental pulmonary blood volume decreased temporary, but after three weeks, it increased again. It was thought that it correlated to the remarkable increase of bronchial arterial blood flow, added increased pulmonary blood volume in non-diseased lung.

A Study of Radiocardiogram During General Anesthesia

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A very few litratures have been reported on variations of mean pulmonary circulating time during anesthesia with relatively new anesthetics such as Fluothane or Penthrane. Therefore, comperative study was carried out by the author on the radiocardiograms which were traced during fluothane, penthrane, ether or thiamylal anesthesia and their emergence after a rapid infusion of RISA (50 μCi at each time) using experimental animals. From those radiocardiograms, the author analysed mean pulmonary circulating time, pulmonary blood volume and cardiac output with the Stewart-Hamilton's method. Circulating blood volume was measured by a Well typed counter.

The following results were obtained from the above experiments.

1) Under spontaneous respiration, mean pulmonary circulating time in Fluothane or Penthrane anesthesia was prolonged twice to 3 times the normal value.

2) Circulating blood volume decreased during surgical stage and increased on emergence in either anesthetics. The author presumes that probably this phenomenon may be caused by primary congestion (pooling) of circulatory blood volume in some organs during anesthesia.

3) Cardiac output reduced during deep anesthesia and increased on emergence without distinction of anesthetics.

4) Pulmonary blood volume increased rate was penthrane, fluothane and thiamylal. On the contrary, pulmonary blood volume was not so reduced on emergence from fluothane or penthrane anesthesia though it was markedly decreased on emergence from ether or thiamylal anesthesia.

Several Considerations on Continuous Recording of Pulmonary Blood Volume Using with External Counting Method of RISA

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We have already reported the continuous recording technique of pulmonary blood volume.

In order to explain the physiopathological behavior of pulmonary circulation in normal subjects and chronic pulmonary diseases (bronchial asthma, chronic bronchitis and so on), we tried the continuous recording of PBV with above method.

When 4% CO_2 gas was given, PBV in each group decreased gradually and then maintained almost steady levels until CO_2 was removed.

Analising these behaviors in each groups which was brought with 4% CO_2 inhalation, we found some prominent drifts of PBV re-

duction as follows.

The one was recognized in the difference of minimal levels of PBV after CO_2 inhalation.

We defined this difference as the magnitude of maximum reduction of PBV, and this magnitude of maximum reduction of PBV, when 4% CO_2 gas was given, was much larger on normal subjects than that on chronic pulmonary diseases in young adults.

The same results was obtained in aged group, having statistical significance.

The second drift of PBV reduction with CO_2 inhalation was found in a difference of maximum reduction rate of PBV between normal subjects and chronic pulmonary diseases.

This appreciable decrease of maximum reduction rate was recognized in chronic pulmonary diseases as compared with normal subjects in aged.

The third drift was found in some prolongations of the time of duration until reached to maximum reduction, and it was absorbed in chronic pulmonary diseases, especially in aged one as compared with normal subjects.

After removal of 4% CO_2 gas inhalation PBV returned to preinhaling level, but in some cases PBV was more 5% increased than that of pre-inhaling level. This rebound phenomena, as we called, was showed in 4 cases in 9 chronic pulmonary disease in the young adults and 2 cases in the aged, in consequence the time duration of these phenomena were prolonged in the aged.

We considered from our results that limited changes of pulmonary hemodynamics in the aged and the chronic pulmonary disease when 4% CO_2 was given, were due to organic and functional changes of pulmonary circuratory vessels and lack of circulatory adaptability.

An Experimental Study on Bronchial Circulation Using RI

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The bronchial circulatory system takes important part in pulmonary circulatory movements, but observation on its haemodynamical aspect seems to be not sufficient enough to clarify the physiological or pathophysiological aspect of pulmonary circulation.

We have induced several kinds of respiratory diseases such as pulmonary suppuration, pulmonary embolism, pulmonary infarction, bronchiectasis and terebene pleurisy in dogs lung, and determinated bronchial circulatory flow (BAF) of dogs in such pathological conditions. In order to make time-course observation, we made measurements applying indicator dilution method using RISA as the indicator, because of reduced surgical injury. Experimental Subjects: 86 male dogs, 10~22 Kg in weight (10 normal, 15 pulmonary suppuration, 15 pulmonary embolism, 24 pulmonary infarction, 11 bronchiectasis, 11 terebene pleurisy) were used as experimental subjects.

Experimental Method: BAF was calculated from dilution curves constructed by plotting radioactivity in each samples taken from two cardiac catheters (one inserted into pulmonary artery and the other into femoral artery) as serial sampling.

Experimental Results: Percentage of BAF against left ventricular flow (BAF%) in normal dogs ranged 0.06~4.48%, (average 1.56%).

In pulmonary suppuration, we made measurements on 3rd, 15th and 25th day after secondary sensitization, and average BAF% were 2.49, 4.93, and 11.19% respectively. Remarcable increase of BAF was observed on 25th day.

In pulmonary embolism, we determinated BAF on 10th minutes, 7th and 14th day after inducement, and average BAF% were 6.93, 8.05 and 7.75% respectively. In this case mild increase of BAF was observed from very early state, but time-course changes were