of the dilution curve can be calculated from this build up curve. In order to clarify this theoretical manipulation, an experiment was performed with anesthetized dog. The right ventricle and lung field were simultaneously scanned following the rapid injection of ^{131}I-MAA through a catheter inserted into the right ventricle. Each data calculated from the right ventricle dilution curve was plotted in the semilogaristhmic graph. The two lines has obtained showed parallel and straight, and straight, and each λ value was approximately equal. It was evidenced that the ^{131}I-MAA curve reflects the right ventricular dilution curve and it is emphasized that this dilution process at the right ventricle can easily estimated upon analyzing the ^{131}I-MAA build up curve. The presently described method is useful as one of indicators of the right heart function in its clinical application.

According to this principle, 5 normal subjects, 12 patients with cardiac diseases, of which the majority consisted of mitral valvular diseases, and 4 patients with various pulmonary diseases were studied. λ values ranged from 0.45 to 0.52 in the normal subjects, on the contrary the λ values in the majority of the cardiac diseases were relatively lower in comparision with normal subjects, ranging from 0.15 to 0.42, and in the pulmonary diseases the values were widely ranged. The effent of inhalation of oxygen of low concentration (12% O_2 for about 10 minutes) were studied in two normal subjects and five cardiopulmonary diseases. All of these subjects showed lower values in λ. These data were considered to indicate an increase in the residual volume of the right ventricle.

Pre and Postoperative Hemodynamics in Cyanotic Congenital Heart Diseases on External Counter Technique

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Pre- and postoperative hemodynamic status of cyanotic congenital heart diseases, especially of tetralogy of Fallot, was examined repeatedly with the use of external counter technique of radioisotope. The data drawn out by this method was compared with those of cardiac catheterization, angiocardiogram and dye dilution curve.

The cases on which radical operation and pre- and postoperative examinations of the above methods were performed are as follows; Tetralogy of Fallot 21, Pulmonary stenosis with R-L shunt 1, Two-chambered right ventricle with R-L shunt 1.

The postoperative change of R-L or L-R shunt was followed up at decided intervals by the simultaneous recording with scintillation counter pointed to the carotid artery and lung field. While, the majority of the cases revealed a prolonged down slope immediately after surgery, suggesting a remainder of L-R shunt, the lung curve became rapid gradually, suggesting disappearance of the shunt. It is noteworthy, on the other hand, that the completely normal curves immediately after surgery in 3 of the cases resulted their death by the 1st postoperative day.

It is apparent that the down slope of radiocardiopulmogram is reflected by blood flow of coronary and bronchial arteries besides intracardiac shunt. Postoperatively, remaining shunt or leak from the attached patch should also be put into consideration.

The postoperative normalization of the down slope pattern cannot be due to remaining intracardiac shunt nor coronary circulation when compared with the cardiac catheterization data. This may be better explained by the following, i.e., the well developed collateral route through the bronchial arteries,

which had been recorded as extracardiac L-R shunt preoperatively, remained to some extent immediately after surgery, and some of the route disappeared as the postoperative hemodynamic status became improved. The possible cause of normal curves in 3 postoperative deaths is markedly decreased blood flow of bronchial arteries due to low aortic pressure and elevated left atrial pressure as the resultants of postoperative low output syndrome and the elevated expiratory resistance rather than to the under-developed collateral route of bronchial arteries prior to surgery.

Measurement of Endocardial Shunt of the Left to the Right by Extracorporeal Counting

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Authors followed Braunwald's method to measure endocardial shunt of the left to the right by extrathoracic counting by $R^{125}ISA$ and compared its value to ^{99m}Tc, the latter was used by Braunwald originally in 1964.

One inch NaI crystal scintillation detector was collimated on the right upper chest, the radiogram has been recorded by YEW-62 type photocorder through spectrometer Aloka Model TDC-I, and scaler Aloka Model TSM-1 respectively.

$R^{125}ISA$ 20 μc has been administered through saphenal vein. The radiogram on the right upper chest was composed a peak and recirculation in case of normal subjects, however, the doubled peak appeared before recirculation and masked the tail of the first peak in case of the left to the right shunt existed.

Thus, the shunt index was calculated by the ratio of the initial peak height and its bottom height. Braunwald reported by ^{99m}Tc its value was less than 0.38 in normal subject, authors' norms, however, was less than 0.36.

In series of 17 cases of ASD or VSD, authors values were 0.49 ± 0.04 preoperatively and 0.38 ± 0.02 four weeks after the radical repairment. When the surgery completed quite successfully in seven cases among them, the shunt index was 0.35 compared to 0.51 preoperative ones.

As non-shunted subject, four cases of mitral stenosis were selected and their values were 0.29 ± 0.01 preoperatively, and 0.31 ± 0.004 postoperatively.

The sizes (X) of ASD or VSD were compared to the shunt index (Y), there has been observed a linear relation of

$$Y = 0.0118X + 0.321$$

and their coefficient of correlation was

$$\gamma = 0.986 \pm 0.008$$

Further ^{99m}Tc-pertechnetate given followed $R^{125}ISA$ on the same subject, to compare the efficiency and the norms.

The norms by $R^{125}ISA$ was less than 0.36, on the other hand, it was less than 0.40 by ^{99m}Tc.

On evaluation of extracorporeal counting, the lower energic one is preferred because of the better resolution and collimation. ^{125}I is a weak γ-ray emitter of 34.5 Kev and its energic half decay throughout the human tissue is 2cm, compared to 9cm of ^{99m}Tc which emitts γ-ray of higher energy, 140.3 Kev. Thus authors' method is preferred to Braunwald's one on clear resolution and better collimation. There is a drawback of longer half life by ^{125}I to ^{99m}Tc, however, using $R^{125}ISA$, circulation Blood Volume, Cardiac Output and mean circulation time are able to obtain simultaneously.