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

R. Ogawa and T. Fujita

Dept. of Anesthesiology, School of Medicine, Gunma University, Gunma

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.