

9 groupes according to final diagnosis. These included 28 aortic aneurysmas, 11 anomalous and/or aberrant vessels, 5 aortitis syndrome, 10 thromboarteritis obliterans and arteriosclerotic obliteration, 2 Leriche's syndrome, 14 arterio-sclerosis without aneurysmas and/or obstruction and hypertension, 7 thoracic tumors and 16 nonvascular patients.

Diagnostic accuracy of aortic aneurysmas was 86%, however, that of aortic aneurysmas except dissecting aneurysmas was improved to be 94%. Diagnostic accuracy of anomalous and/or aberrant vessels was 73%, that of obstructive arterial dis-

eases was 83%, aortitis 100%, and whole of the arterial disorders 82%.

RN angiography was useful for screening of various vascular disorder as aortic aneurysmas, anomalous and/or aberrant vessels, vascular lesion of aortitis syndrome, thromboarteritis obliterans and arteriosclerotic obliteration. However, detection of small arterial lesions distal to popliteal and axillar arteries were difficult and thought to be limitation of present RN angiography. Blood pool image was generally not useful, however, it may be useful in patients with left-to-right intracardiac shunt.

Clinical Experiences on First Transit Radioisotope Angiocardiography Using Autofluoroscope System 77

Kikuo MACHIDA, Junichi NISHIKAWA, Tohru MACHIDA and Akira TASAKA
Department of Radiology, Faculty of Medicine, University of Tokyo, Tokyo

Left ventricular function was studied in 91 cardiac patients using ^{99m}Tc -pertechnetate and autofluoroscope system 77. A small volume of ^{99m}Tc -pertechnetate of 15~20 mCi was injected into the right antecubital vein and was flushed consecutively with 20 ml of physiological saline. The counts over the region of the left ventricle were recorded at 50~100 msec intervals during the first transit of radioisotope. In seventy-two patients left ventricular ejection fraction (LVEF) was obtained from the first transit of radioisotope through the heart. They were divided into the four groups according to the functional classification of New York Heart Association (I:21 cases, II:34, III:15, IV:2). LVEF was 55.3 per cent in group I, 42.1 in II, 29.8 in III, and 18 and 40 in

two cases of group IV. The difference of mean values are statistically significant. In twenty cases the change of left ventricular volume pattern was calculated from the average value of four beats. The pattern of group I reveals the initial sharp decrease of volume (high dv/dt) with rapid and slow diastolic filling period. In group III, the change of volume is small (low dv/dt) and in some cases the rapid and slow filling period was difficult to recognize. The group II showed the mixed pattern of I and III.

In conclusion, this method is useful and reliable in clinical cardiology to assess the hemodynamic function and the simplicity and safety of nuclear angiocardiography is suited for sequential studies in the cardiac patients.

Correlation between Ejection Fraction and Pulmonary Mean Transit Time

S. HATAKEYAMA*, H. SHIDA**

**Department of Radiology, School of Medicine, Gunma University*

***Department of Radiology, Rosai Hospital for Silicosis*

Ejection Fraction (E.F.) and Pulmonary Mean Transit Time (P.M.T.) were evaluated in 60 patients of various heart and lung disease by using System 70 gamma camera.

Significant correlation was not noted between them. For this result, each measurement must be investigated separately. Even in the same disease, each value was various by the degree of the lesion.

In the case of myocard infarction, E.F Was corresponding to the degree of coronary artery stenosis, but P.M.T was within normal limits unless there was the evidence of pulmonary lesion. Lung lesions such as silicosis and chronic obstructive lung disease showed the tendency of prolongation of P.M.T, but E.F was unremarkable, at least, in early stage. Abnormal E.F was considered to be secondary heart disease damage by lung lesion. P.M.T was also prolonged in the various valvular heart disease. This might be due to increased blood volume in pulmonary circulation or decreased in body. Left-to-Right cardiac shunt disease showed no significantly

specific pattern, but a given tendency was noted, corresponding to the shunt rate and the degree of pulmonary hypertension. There was not also correlated between E.F and P.M.T in the patients of congestive heart failure and primary myocardial disease. This might be considered that these patients were well controlled by the treatment at the time of study.

As described above, there was not correlation between E.F and P.M.T, however, evaluation of them is indispensable to get the objective data compatible with other clinical findings, evaluating the effect of treatment, prognosis of the disease and follow-up study.

Effect of Exercise on Left Ventricular Performance: Comparison between Athlete and Non-Athlete

Hajime MURATA, Masahiro IIO, Hinako TOYAMA, Shinichiro KAWAGICHI,
Kazuo CHIBA, Hideo YAMADA, Kengo MATSUI and Katsumi ASANO
Tokyo Metropolitan Geriatric Hospital

Left ventricular function was examined before and after the exercise with bicycle ergometer. Two cases of non-athletes and 10 cases of amateur athletes were evaluated, the latter group had history of daily road training for years.

High temporal resolution ECG gated analysis was performed after intravenous injection of ^{99m}Tc -albumin to visualize intracardiac pool. Using scintillation camera-computer system and LIST mode data acquisition, sequential events during 20 msec intervals were continuously recorded for 1800 cardiac cycles before the exercise and for 350 cycles immediately after the exercise. From these sequential data, such indices were obtained as relative volume curve ($V(t)/VED$), ejection fraction (EF), relative volume velocity ($dV(t)/dt/VED$), maximum systolic volume velocity (MSVV) and maximum diastolic volume velocity (MDVV).

The mean value of EF before and after the exercise were 70.4 and 68.2% for middle-aged athletes, 61.3 and 70.6% for aged athletes, and 70.1 and 77.8% for middle aged non-athletes. The mean MSVV before and after the exercise were 3.7 and 5.6/sec in middle aged athletes, 3.7 and 4.6/sec in aged athletes, 5.0 and 7.0/sec in non-athletes. The mean MDVV before and after the exercise for three groups were 3.8 and 5.1/sec, 3.0 and 3.9/sec, 4.3 and 4.5/sec, respectively. Ejection fraction of non-athletes and aged athletes were increased significantly by the exercise, whereas EF remained normal in middle-aged athletes after the exercise. These results showed the significant effect of athletics on the left ventricular performance and the method proved to be of value for the evaluation of physiological function of the left ventricle.