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## DETECTION OF MYOCARDIAL LESIONS OF COLLAGEN DISEASE BY SERIAL Tl-201 IMAGING AFTER DIPYRIDAMOLE.

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Myocardial lesions of progressive systemic sclerosis (PSS) or systemic lupus erythematosus (SLE) may be attributed to the involvement of small coronary arteries (SCA). We studied the functional capacity of coronary vasodilation in response to an intravenous administration of dipyridamole (Dip) using Tl-201 myocardial imaging. Myocardial images after Dip (0.56 mg/kg) and 2 hours after were obtained in 7 patients (pts) with PSS, 5 pts with SLE and 8 control subjects. Persistent defect and reverse redistribution which may reflect localized myocardial injury were observed in 6 pts. Transient defect was detected in 3 pts. The ratio of myocardial (M) to lung (L) Tl-201 activities (M/L ratio) and regional washout rate (WR) which can be closely related to the myocardial flow response were calculated. Mean M/L ratio and mean WRs were significantly lower in the pts group than in the control subjects. Seven of 12 pts showed diffusely decreased WR. Thus, in pts with PSS or SLE, the coronary flow reserve was frequently limited presumably due to the involvement of SCA. These results suggest that Tl-201 imaging after Dip is useful to assess myocardial injury and the functional capacity of coronary vasodilation in these diseases.

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## BASIC EXAMINATION OF CARDIAC SPECT BY ELLIPTICAL ORBIT.

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Formerly, it is impossible for the revolutionary type of the  $\gamma$ -camera to keep its detector closing on patient's body because of a circular orbit. We examined orbit in cardiac muscle, using the characteristic table (Programable Body Contour GE) of ECT imaging spatial resolution. At first, we measured of FWHM, contrast resolution and uniformity and compared basic efficiency between an elliptical orbit and circle's making use of Tl-201 and ECT phantom. Secondly we examined a faculty resolution of deficient of myocardium phantom. Finally we came to the conclusion as the following. As for contrast resolution, using the myocardium phantom, the elliptical orbit is superior to the circular, and contrast improvement rate differs from each parts. Especially they were notable in the front and side wall.

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## A NEW METHOD OF PHASE ANALYSIS FOR MULTI GATED MYOCARDIAL IMAGES. H.Toyama, R.Hatake yama, T.Takeda, R.Ebihara, N.Ishikawa, M.Akisada, R.Azizaka, Y.Sugishita and I.Ito. Inst. Clinical Med. Univ. Tsukuba, Ibaraki.

A new method of phase analysis for multi gated myocardial image with Tl-201 was developed in order to evaluate the regional contraction of myocardium. Multi gated myocardial images were taken at the 40 msec interval in the LAO view during several minutes. Normal controls (2) and three cases of HCM were examined. A time-activity curve for whole myocardium was shown almost constant in time during a cardiac cycle. A total count on the line drawn radially from the center of the heart was varied depending on the contraction, which is corresponded to the wall thickness change of the heart. Fourier analysis was performed for eight curves, respectively, which were generated from the radially drawn lines on the myocardium. The maps of amplitude and phase consisted of eight sector regions were depicted in color images. The map of amplitude reveals the regional distribution of the value of percent thickness. In a case of HCM with EF=75% and septal thickness=15 mm mildly decrease of amplitude in the septum was shown compared with normal one. In another case of advanced HCM (EF=79%, septal thickness=24mm), the amplitude in the septum decreased severely. In conclusion, the amplitude image reflects the regional contractility of the myocardium.

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## Dynamic studies of Tl-201 myocardial perfusion image using ring-type SPECT.

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Dynamic study was performed in 16 patients with coronary artery disease (CAD) using ring-type SPECT and in vivo kinetics of Tl-201 in the ischemic myocardium was observed successfully. As to the examination method, submaximal exercise was loaded with ergometer and 2-4 mCi of Tl-201 was injected. 5 min scan was serially repeated 5 times from 5 min later after injection and 10 min scan was carried out 3 times, every hour later. Results obtained showed that findings of CAD patients were classified into 3 types, that is, persistent defect which corresponds to myocardial infarction, hypoperfusion area where Tl-201 uptake is decreased and washout is slow and homogeneous distribution which washout rate is reduced. The former two are consistent with previous knowledge but it seemed necessary that whether delayed washout is really suggestive of diffuse ischemic state of heart should be further investigated.