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AN EVALUATION OF METHODS TO CALCULATE LEFT VENTRICULAR EJECTION FRACTION.

K. Koizumi and I. Tatsuno. Department of Radiology, Kanazawa National Hospital. Kanazawa.

Recent advance in nuclear medicine computer system has given us easy methods to calculate ejection fraction of the left ventricle. But many of them are not so reliable because different conditions to acquire data or to analysis data may easily modify ejection fraction values. We discussed how to acquire data or to analysis data in order to make ejection fraction values reliable. Image acquisition interval, collimator, left ventricular determination, back ground area and so on were discussed. According to constant methods, we determined a normal range in our hospital as 66.4 ± 5.4 % (n=10).

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ASSESSMENT OF THALLIUM 201 UPTAKE IN MYOCARDIUM AND CORONARY CIRCULATION.

S.Suzuki,M.Fukumoto,Y.Kawamura, J.Yamazaki,S.Iida,T.Shindo and T.Morishita. 1st Internal Medicine,Toho University School of Medicine. Tokyo.

In order to assess the Thallium 201 (^{201}Tl) uptake in myocardial scintigram and the coronary circulation in coronary cineangiography, we performed quantitive assessment of TL-201 myocardial scintigram.
The patient included 19 with ischemic heart disease, 5 with other heart disease and 5 control subjects.
These patients were given intraveneous injection of TL-201 and myocaldial scintigrams were obtained from three different views. (anterior, left lateral and left anterior oblique.)
The data was processed by an on line miniconputer system.
Our study suggested that the TL uptake in myocardial scintigram, reflected collatelal circulation, recanalization and run off of coronary artery in cineangiocardiogram, but the change of the left ventricular wall motion did not correspond with the degree of the TL uptake in myocardial scintigram.

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QUANTITATIVE ASSESSMENT OF MYOCARDIAL SCINTIGRAPHY WITH THALLIUM-201 CHLORIDE.

F.Shishido, Y.Tateno, S.Kaneko, Y.Masuda, and Y.Inagaki. National Institute of Radiological Sciences and Chiba Univ. Chiba

The efficacy of thallium-201 myocardial scintigraphy was evaluated by comparison with coronary angiography. Normal subjects and patients with myocardial ischemia, which were confirmed by coronary angiography, were examined by Tl-201 scanning. In each case, anterior, LAO at 30° 45° and 60° and left lateral views were examined by MaxiCamera II and Med IV (GE). Interpretations were made by three different methods, that is unprocessed images, background-subtracted images, and indeces calculated from ROIs over myocardial images. These images were interpretated independently without the knowledge of clinical and laboratory findings. The background for subtraction was defined at the left lung field. ROIs of 10x10 matrix were defined at a tangential myocardial wall for the ROI method. The calculation methods were: (i) ROI in the center of the heart image / total counts of the heart image, (ii) each ROI / ROI in the center of the heart image, (iii) each ROI / total of each ROI. Indeces beyond the confidence limits (p=0.95) of normal were interpreted as abnormal.

The sensitivities of three methods were 0.26, 0.56, 0.64 respectively, and the specificities were 0.81, 0.74, 0.78, respectively. The sensitivity of the ROI method was superior to other methods, while the specificities of the three were almost same.

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EVALUATION OF MYOCARDIAL ISCHEMIA BY QUANTITATIVE ANALYSYS OF 201-Tl MYOCARDIAL SCINTIGRAPHY.

T.Ohtomo, H.Kunishige, M.Sakanaka, Y.Kira, Y.Kohno, C.Yamada, K.Takagi, H. Adachi. 3rd. Dept. Int. Med., Matsushita Hospital, 2nd. Dept. Int. Med., Kyoto Pref. Univ. of Med., Osaka and Kyoto.

The purpose of this study was to introduce a new computerized method which we devised to make an accurate evaruation of thallium activity in the respective myocardial segments. We obtained a total of 600,000 counts images in the anterior, left anterior oblique 30°, 45°, 60°, left lateral and right anterior oblique 30° projections. A total of 34 subsegments was set up for calcuration of the "subsegmental uptake index"(SSUI) on the left ventricular images obtained in 6 projections. The myocardial perfusion of a subsegment was relatively represented by SSUI. The myocardial wall was anatomically classified into 6 segments, namely septal wall, anterior wall, lateral wall, posterior wall, apical part and inferior wall. Then "segmental uptake index" (SUI) was computed. Each SUI was consisted of several SSUI's weighted with a maltiplier of 1, 2 or 3 in order that its directivity was magnified. In 34 cases for which SUI's were computed,individual segments of diminished activity were graded into 5 ranks by unanimous agreement of 7 physicians. Our method showed a good semi-coincidence rate (82%) with the diagnosis of 7 physicians in total segments.