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RELATION OF REGIONAL WALL MOTION TO PERFUSION DEFECT ASSESSED BY SPECT IN MYOCARDIAL INFARCTION.

S.Katsushika,F.Ohsuzu,H.Seguchi,S.Yanagida, M.Akanuma,M.Sakurada,N.Aosaki,H.Nakamura, T.Shishido,T.Hoshina,S.Sueoka,T.Takeshita, H.Takanashi and E.Takenaka. National Defense Medical College, Tokorozawa.

The relation of left ventricular regional wall motion to perfusion defect was evaluated by multigated blood pool imaging and SPECT in 9 patients with myocardial infarction(MI). SPECT data was collected for 32 views with gamma camera rotated from LPO to RAO position. Tomographic sections oriented perpendicular and parallel to the long axis of left ventricle were reconstructed. The sections were divided into five regions, where perfusion defect was semiquantified by four-step scoring method (from 0:no defect to 3:perfect defect). Total defect score(TDS) was calculated as the sum of the points in each patients. On the other hand, planar imaging was obtained with gamma camera oriented in LAO 45° position. Left ventricular ejection fraction(EF), radial chord shortening and regional ejection fraction(REF) were calculated by computed analysis. In anteroseptal MI, reverse relation existed between TDS and EF($r=-0.57, p<0.1$). Moreover, there was a negative correlation between septal defect score and septal REF($r=-0.72, p<0.05$). In inferior MI, significant relation was not found as the cases were less. These results suggested that regional wall motion abnormality was quantitatively speculated by regional perfusion defect using SPECT.

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QUANTITATIVE EVALUATION OF ROTATIONAL TL-201 TOMOGRAPHY AND THE UTILITY OF BULLSEYE FUNCTIONAL IMAGE.

N.Watanabe,E.Kathono,H.Abe T.Tanaka,K.Shima,F.Tsuda,M.Takeuchi. Oota General Hospital. K.Oowada,K.Ono,S.Kariyone. Fukushima Medical College,Fukushma.

To evaluate quantitatively the size and degree of myocardial perfusion defects from Single Photon Emission Conputed Tomography(SPECT) images, Tl-201 studies were performed in 26 patients with myocardial infarction using circumferential profile(CP) analysis sampled at 40 segments on short axis image. Normal CP curve was established by data of 10 normal cases(normal CAG and LVG). We calculated a deviated value between CP curve of patient and the curve of normal case. The parameter was used as Defect Score(DS),which represented the size of perfusion defect. The sum of DS was compared with the % perimetric circumference(%PC), % sectional contraction fraction(%CF) and LVEF obtained by LVG. The correlation between DS and %PC was high($r=0.834$).The correlation between DS and %CF was low($r=-0.869$).The correlation between DS and LVEF was low too($r=-0.775$). These result showed that DS can accurately the size and degree of infarcted area. And then we made an image of BULLSEYE functional map,which indicated a good correlation between DS and the size of perfusion defect showed by BULLSEYE. Thus, it would be useful method to comprehense the size of perfusion defect 3-dimensionaly.

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A NEW METHOD EVALUATING INFARCT SIZE WITH SPECT: WITH SPECIAL REFFERENCE TO THE INFARCTION MAP WHICH WE DEVISED.

Y.Sekiai,M.Sawai,S.Murayama,A.Mikuniya and K.Onodera.2nd Dept.of Int.Med.,Hirosaki Univ.,Hirosaki.K.Nishizawa.Dept.of Radiol., Hirosaki Univ.,Hirosaki.K.Okamoto.Dept.of Int.Med.,Hirosaki Municipal Hospital, Hirosaki.H.Kamata.Dept.of Radiol.,Hirosaki Municipal Hospital,Hirosaki.

We devised the infarction map for evaluating infarct size in patients with myocardial infarction using SPECT. Following injection of 4 mCi of thallium, the gamma camera was rotated around the heart and 30 projections were obtained over 180° in 10 normal subjects and in 11 patients with myocardial infarction. Seven shortaxis sections in left ventricle were reconstructed continuously from apex to base with SPECT, and circumferential profile curve was created in each section. At first, normal limits values were derived from 36 points in each section, and every 7 sections in normal subjects. Decision of infarct point was defined in circumferential profile curves as one which was lower than the 2 standard deviations (SD) of the mean in 10 normal subjects. Afterwards, infarction map was constructed with the infarct points defined above and the percent defect was calculated from the ratio of infarct area to total area in left ventricle. We conclude that this method with infarction map may be useful in assessing non-invasively the extent of myocardial infarction.

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EVALUATION OF SPECT WITH ATTENUATION CORRECTION METHOD.

J.Nagashima.H.Nishino.A.Yamagata.M.Tanno. K.Chiba and H.Yamada. *H.Toyama. Devision of nuclear medicine. Tokyo Metropolitan Geriatric Hospital.Tokyo. * University of Tukuba.Ibaraki.

Tl-201 myocardial perfusion scan with planar and SPECT images was evaluated for detecting myocardial infarction(MI) or fibrosis. SPECT images were generated using radial post correction method(RPC) developed by Tanaka(1984) and non-attenuation GE-STAR method. In patients. SPECT images with RPC(correction factor=0.18) showed disagreement from planar and non-attenuation correction images. False positive was frequently observed at anteroseptal portion of short axial images on SPECT with RPC. causing a trouble for clinical diagnosis of MI. The most appropriate value of attenuation correction of 0.14 was obtained by Hosoba using computer simulation. Therefore in human myocardium. SPECT images with RPC were evaluated with various correction values. High quality image. especially at posterobasal portion of left ventricle. was also obtained at correction value of 0.14. But images with complete uniformity could not be obtained by this method.