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


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We devised the infarction map for evaluating non-invasively the extent of myocardial infarction using circumferential profile (CPF) analysis. The parameter was used as a Defect Score (DS), which represented the size of perfusion defect. The sum of DS was compared with the % metric circumference (MCP), % sectional contraction fraction (%CF) and LVEF obtained by LVG. The correlation between DS and MCP was high (r=0.834), the correlation between DS and %CF was low (r=-0.869), and the correlation between DS and LVEF was low too (r=-0.775). These results showed that DS can accurately evaluate 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 comprehend the size of perfusion defect 3-dimensionally.

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


To evaluate quantitatively the size and degree of myocardial perfusion defects from Single Photon Emission Computed Tomography (SPECT) images, TL-201 studies were performed in 26 patients with myocardial infarction using circumferential profile (CPF) 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 a Defect Score (DS), which represented the size of perfusion defect. The sum of DS was compared with the % metric circumference (MCP), % sectional contraction fraction (%CF) and LVEF obtained by LVG. The correlation between DS and MCP was high (r=0.834), the correlation between DS and %CF was low (r=-0.869), and the correlation between DS and LVEF was low too (r=-0.775). These results showed that DS can accurately evaluate the size and degree of infarcted area.

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 short-axis 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. Then, the infarct sections were defined in circumferential profile curves as one which is lower than the 2 standard deviations (SD) of the mean in 10 normal subjects. The 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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A NEW METHOD EVALUATING INFARCT SIZE WITH SPECT: WITH SPECIAL REFERENCE TO THE INFARCTION MAP WHICH WE DEVISED.

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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 short-axis 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. Then, the infarct sections were defined in circumferential profile curves as one which is lower than the 2 standard deviations (SD) of the mean in 10 normal subjects. The 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.


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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 factor (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 images, 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.