120

QUANTITATIVE ANALYSIS OF MYOCARDIAL PERFUSION IN ISCHEMIC HEART DISEASE BY SPECT.

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To evaluate the detection of perfusion defect in myocardial infarction with SPECT, quantitative analysis was applied in this study. Circumferential profile analysis was performed in 10 normal cases to determine normal values (mean+SD). In SPECT, apical, septal area showed slight lower activity in normal cases, therefore, these findings were considered in order to interpretate perfusion defect in myocardial infarction. Sensitivity and specificity of detection of perfusion defect by SPECT was 95% and 88%, whereas 95% and 76% by planar imaging. Then, ROC (receiver operator curve) analysis was also performed in these cases. ROC analysis showed advantage in the detection of perfusion defect compared to that of planar imaging.
Furthermore, circumferential analysis was also performed to the detection of ischemia by stress thallium imaging with SPECT.
In conclusion, SPECT was superior than planar imaging in the detection of perfusion defect in ischemic heart disease.

121

USEFULLNESS OF TWO LONG AXIS SECTIONAL VIEWS AND A SHORT AXIS SECTIONAL VIEW IN ECT WITH Tl-201 IN MYOCARDIAL INFARCTION. -RELATIONSHIP WITH ABNORMAL WALL MOTION IN LVG -

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ECT was performed in 55 patients with myocardial infarction(MI)at least 2 weeks after the attack.From projection images,6 series of sections were reconstructed,i.e.,in horizontal,frontal and sagittal sections of the body,in 2 long axis sections and in a short axis section of the left ventricle(LV), at section intervals of 6mm.
We studied the relationship among the area of perfusion defect,the abnormal Q waves in ECG(inverted T waves in subendocardial infarction)and localization of abnormal wall motion of LV,confirmed by LVG with radiopaque contrast medium.By making the judgement with both the 3 tomographic sectional views("3 views")and 6 tomographic sectional views("6 views"), and comparing these 2 assessments,we clarified the usefullness of performing the 3 series of sections,using 2 long axis and short axis sections of LV in addition to the conventional horizontal,frontal and sagittal sections.(1) incidence of sensitivity between ECG and ECT in part-to-part matching was 76% for "3 views" and 84% for "6 views",between LVG and ECT in part-to-part matching was 80% for"3 views" and 88% for"6 views".(2)It became easier with "6 views" to localize the area of perfusion defect and that of surviving myocardium.

122

STRESS ^{201}Tl MYOCARDIAL SPECT FOR THE DETECTION OF MULTIVESSEL DISEASE IN PATIENTS WITH PREVIOUS MYOCARDIAL INFARCTION.

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To evaluate clinical usefulness and limitation of stress ^{201}Tl myocardial SPECT in ditecting multivessel disease (MVD), 72 patients with previous myocardial infarction (MI) were studied. Transaxial, sagittal and coronal tomographic images were examined qualitatively. The results were as follows.
1)Sensitivity for detection of MI was 100%, and sensitivity & specificity for detection of individual coronary arterial lesions by segmental analysis of SPECT images were fairly high.
(sensitivity : LAD 88%, LCX 66%, RCA 92%,
specificity : LAD 93%, LCX 92%, RCA 82%)
2)Sensitivity in detecting both single vessel disease (29/34 : 85%) and MVD (27/38 : 71%) were fairly high.
3)In 31 patients with MVD (excluding 4 cases of LCX+RCA lesions), detectability of infarcted vessel and concomitant affected vessel was studied.
In patients with previous anterior MI, concomitant LCX or RCA lesions were detected in only 4 of 11 cases (36%), whereas in those with previous postero-inferior MI, sensitivity for LAD lesion was 75% (15/20).
Thus, stress SPECT is a useful noninvasive technique for the detection of MVD in the patients with previous MI, especially in postero-inferior MI, but have a limitation to detect MVD in the patients with anterior MI.

123

CLINICAL SIGNIFICANCE OF EXERCISE-INDUCED ST-SEGMENT CHANGES IN PATIENTS WITH PRIOR MYOCARDIAL INFARCTION - EVALUATION WITH SPECT FOR TL-201 MYOCARDIAL IMAGING.

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To ascertain the clinical significance of exercise (Ex)-induced ST-segment changes post-infarction, we performed Ex Tl-201 SPECT in 93 patients with prior myocardial infarction (MI) and compared ST changes with SPECT,coronary arteriographic and left ventriculographic findings. 30 out of 93 cases (32%) had ST depression, 20 (21.5%) had ST elevation, 9 (10%) had both ST depression and elevation and remaining 34 (36.5%) had no significant ST changes. ST depression and transient perfusion defect (PD) in SPECT were noted in 29% and 52% respectively in single vessel disease, while 53% and 75% respectively in multivessel disease. 35 out of 39 cases with ST depression (90%) had transient PD and in cases with marked ST depression more than 3 mm, persistent PD was also noted in non-MI area and it seemed to represent the presense of severe ischemia. No apparent relation was noted between ECG leads with ST depression and PD. All of 28 cases with ST elevation were noted in anterior MI cases (58%), and 26 out of these showed severe LV wall motion abnormality and broad permanent PD. Only 15 cases (54%) showed redistribution phenomenon.
Thus, we conclude that in patients with prior MI, Ex-induced ST depression seems to reflect myocardial ischemia and ST elevation possibly relates abnormal LV wall motion.