

Keimyung University in South Korea Verifies our Prior Findings.



Five-minutes post-stress gated myocardial perfusion SPECT using Tc-99m tetrofosmin

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Objectives

Generally gated myocardial SPECT was been performed by comparing rest and stress scan 40-60 minutes after injection of radiopharmaceutical. But in one recent study, the authors proposed new protocol comparing 5-minutis and 1-hour post-stress images using Tc-99m sestamibi, which is better than rest/stress protocol to detect ischemia and vulnerable plaque. Aim of this study was to evaluate this new protocol of gated myocardial SPECT, using Tc-99m tetrofosmin.

Materials and Methods

We prospectively applied the new protocol to total 72 patients (34 males and 38 females, mean age, 66.3±12.0) from June 2011 to July 2011. The new protocol was intravenous injection of Tc-99m tetrofosmin 1500 MBq during adenosine stress, and two stress studies were performed 5 minutes and 1 hour each after injection. We assessed image quality by semiquantitative analysis divided into three groups. Myocardial perfusion was evaluated visually, and left ventricular function was assessed by EDV, ESV, and EF. Fourteen patients underwent coronary angiography after gated myocardial SPECT.

Results

Normal SPECTs of 30 patients were shown between 5MPS and 1HPS without discrepancy. Of abnormal SPECTs of the rest 42 patients, 16 (38.0%) studies revealed increased size or severity of perfusion defect in the 5MPS than that of 1 hour image, 2 (4.8%) studies showed new lesion in the 5MPS only, 8 (19.0%) studies revealed conversely, and 20 (47.8%) studies showed concordance. Image quality of 5MPS were worse than that of 1HPS in 23 (31.9%) cases due to hepatic and bowel uptake, the reverse was none. EDV, ESV, and EF were statistically no significant differences between two stress images.

Table 1. Comparison of perfusion defect severity in abnormal patients between 5MPS* and 1HPS**

Severity	5MPS						
	mild	mid to moderate	moderate	moderate to severe	severe	severe to absent	absent
1HPS mild	4	1					
1HPS mid to moderate	2	5	6	1			
1HPS moderate		2	2	3			
1HPS moderate to severe				2	1		
1HPS severe						1	
1HPS severe to absent					2	5	2
1HPS absent							

*5MPS: 5-minute post-stress image, **1HPS: 1-hour post-stress image

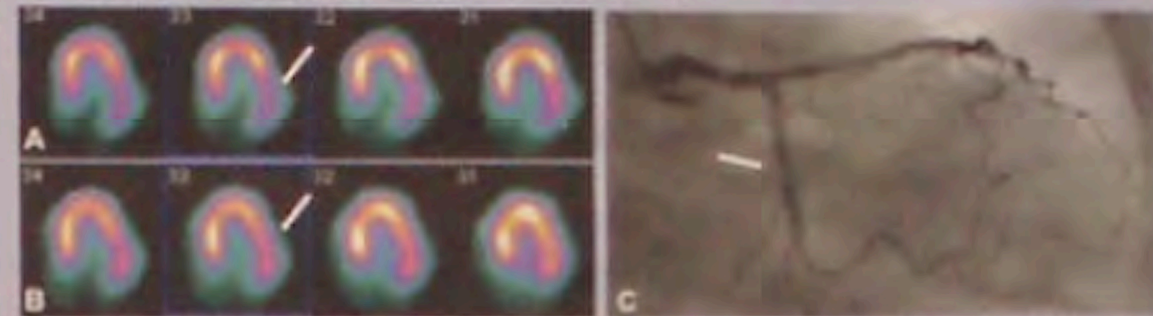


Figure 1. 92-year-old woman with atypical chest pain and elevated cardiac enzyme underwent gated myocardial SPECT. It revealed medium-sized moderately decreased perfusion in the mid-basal lateral wall on 5MPS (A). However, no definite abnormal perfusion defect was seen on 1HPS (B). Coronary angiography showed a focal stenosis (72%) in the left circumflex artery (C), and the stent insertion procedure was done.

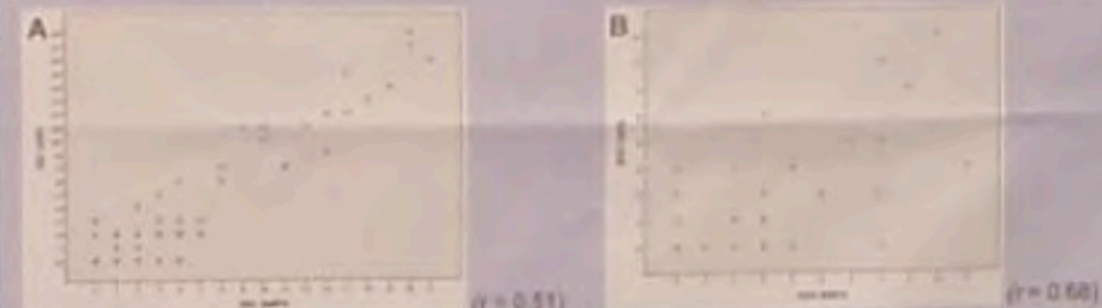


Figure 2. Correlation of summed stress score (SSS, A) and summed difference score (SDS, B) between 5MPS and 1HPS. 5MPS was more sensitive than 1HPS in the patient with low SSS.

Conclusions

Although image quality of 5MPS was worse than that of 1HPS due to extracardiac uptake, there was no case unable to interpret. In about 40% of abnormal SPECTs, 5MPS showed increased extent of perfusion defect or new lesion compared with 1HPS. Thus, 5MPS might be helpful to detect the suspicious or hidden lesion on 1HPS.

References

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