Coronary Artery Disease Assessment Using Tc-99m MIBI Gated Myocardial Perfusion Scintigraphy Prior to Kidney Transplantation

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INTRODUCTION

- Coronary artery disease (CAD) is highly prevalent in patients with end-stage renal disease and is the leading cause of death. In these patients, cardiovascular evaluation before kidney transplantation should be performed to detect CAD and determine perioperative cardiac risk, even if the patient is asymptomatic.
- Myocardial perfusion scintigraphy (MPS) is a non-invasive imaging method that has long been used in the clinical evaluation of CAD. This method identifies areas of ischemia or infarction by examining the perfusion of myocardial cells by evaluating images taken after radiopharmaceutical injection. It also provides the opportunity to evaluate parameters such as wall movements and thickening through gated images synchronized with electrocardiography (ECG).
- The aim of this study was to evaluate the clinical value of Tc-99m sestamibi (MIBI) gated MPS in the detection of CAD in patients with end-stage renal disease.

MATERIALS &METHODS

- One hundred seventy- four patients with end-stage renal disease were included in the study (76 F, 98 M, mean age 49.14±24.81 years).
- All patients underwent a one-day stress-rest Tc-99m MIBI gated MPS imaging protocol with a SPECT gamma camera (NM/CT80, GE, US) after a fast of at least 6 hours. After pharmacological stress was applied to 102 patients and treadmill exercise test was applied to 72 patients, 8 mCi Tc-99m MIBI (Medi-Radiopharma Ltd, Hungary) was injected intravenously. After approximately 45-60 minutes, the patients were placed on the SPECT gamma camera acquisition table in the supine position and 3D stress gated MPS images were obtained synchronously with the ECG. Three hours later, 25 mCi Tc-99m MIBI was administered intravenously to the patients for resting imaging, and 3D resting gated MPS images were taken 45-60 minutes after the injection under the same conditions as the stress scan. Perfusion and wall motion images of the left ventricle were evaluated visually by Nuclear Medicine physicians.
- Coronary angiography (CAG) was subsequently performed in cases with findings suggestive of CAD in Tc-99m MIBI gated MPS.

RESULTS

- Tc-99m MIBI gated MPS was completely normal in 157 of the patients. These patients were considered to be at low risk for CAD and coronary angiography was not required.
- In Tc-99m MIBI gated MPS, reversible perfusion defects (ischemia) and wall motion abnormalities (hypokinesia) were observed in 17 patients. Ischemia was observed in the anterior wall in 3 cases, in the lateral and anterior walls in 1 case, in the inferior and inferoseptal walls in 1 case (Fig.1.), in the inferior wall in 5 cases, in the anterior and inferior walls in 1 case, and in the inferior and inferolateral walls in 6 cases.
- These 17 patients then underwent CAG and the findings were determined to be compatible with the scintigraphy, then revascularization was performed.

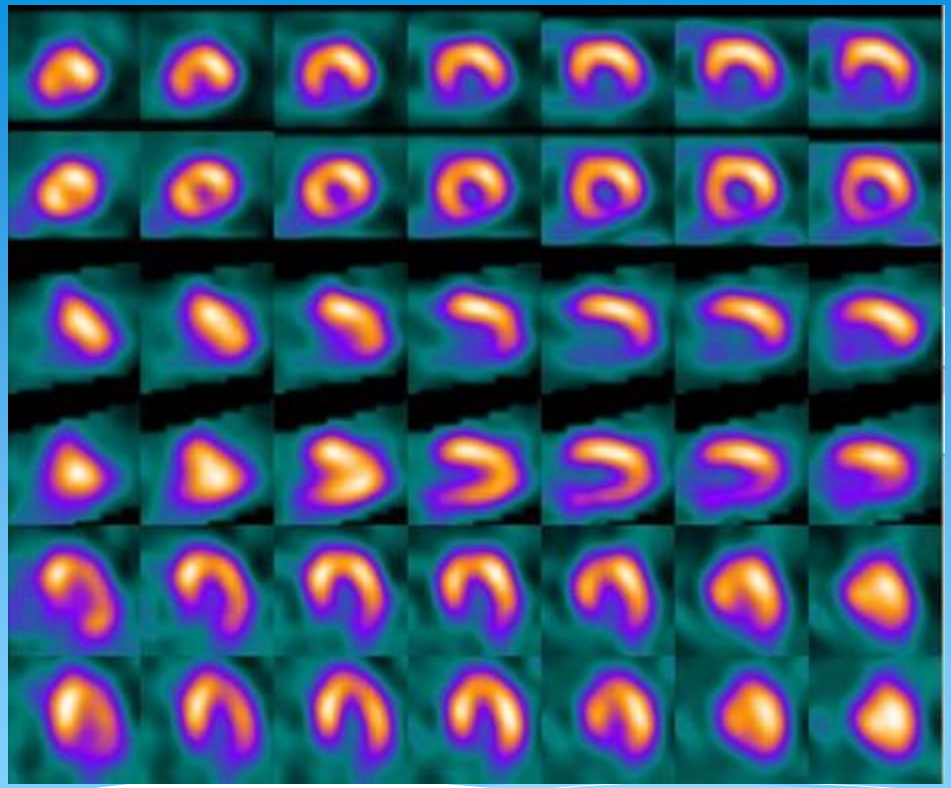

Fig.1. Stress and rest images of a 44-year-old case with end-stage renal disease in whom reversible perfusion defect (ischemia) was observed in the inferior and inferoseptal walls in the Tc-99m MIBI gated MPS study.

CONCLUSION

- In light of this study, we thought that Tc-99m MIBI gated MPS could be a preferred imaging method for pre-transplant CAD detection and CAD risk classification in end-stage renal failure patients, as it is noninvasive, easily applicable and has high diagnostic accuracy.