

## Summary

### Reduction of the Influence of the Liver Uptake to the Myocardial Uptake on Technetium-99m Myocardial SPECT; Usefulness and Problems of a Mask Processing Method

Akihiro TAKAKI\*, Kazuhiro OKADA\*, Johji URATA\*, Hirofumi MATSUDA\*\* and Yuji TAKAO\*\*

*\*Division of Diagnosis Imaging Center, Saiseikai Kumamoto Hospital*

*\*\*Division of Cardiology, Cardiovascular Center, Saiseikai Kumamoto Hospital*

The aim of this study is to evaluate the usefulness of a mask processing method for obtaining the true myocardial tracer distribution by eliminating the influence of the liver uptake to the myocardial uptake on myocardial SPECT images by using technetium-99m ( $^{99m}\text{Tc}$ ) blood flow agents.

A SPECT imaging was performed with a two-head SPECT system (GCA-7200A/DI) in both phantom and clinical studies. The mask processing method was applied to the reconstructed and projection images. The phantom consisted of heart, lung, liver and spine. A defect was located in the inferior wall of the left ventricle and other parts of the heart and liver were filled with  $^{99m}\text{Tc}$  solution. For clinical study 10 patients with difficulty in the interpretation of the inferior wall were selected for the evaluation of usefulness of the mask method.

In the phantom study, the mask processing method applied to the reconstructed images was able to remove the overlapped liver from the heart, but was not able to remove the influence of the liver uptake to the

myocardial uptake. Nevertheless, the mask processing method applied to the projection images successfully eliminated not only the overlapped liver but also the influence of the liver uptake to the myocardial uptake.

In the clinical study, the liver uptake could be removed from the uptake in the inferior wall in 8 of 10 patients with the mask processing methods. In 2 patients, the overlapped liver uptake could not be eliminated from the uptake in the inferior wall because the distance between the liver and heart was too short. The mask processing method applied to the projection images was thought to be superior to that applied to the reconstruction images in both phantom and clinical studies.

The mask processing method, especially applied to the projection images, seems to be useful for the elimination of the liver uptake from the inferior wall of the myocardium on myocardial SPECT images using  $^{99m}\text{Tc}$  blood flow agents.

**Key words:** Artifacts, Mask processing, Cardiac SPECT,  $^{99m}\text{Tc}$ -MIBI,  $^{99m}\text{Tc}$ -tetrofosmin.