

### **The Diagnosis of Renal Cortical Lesions by $^{99m}\text{Tc}$ -DMSA Renal Imaging in Patients with Chronic Pyelonephritis due to Primary Vesicoureteral Reflux**

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The primary vesicoureteral reflux (VUR) is one of the causes of chronic pyelonephritis. In the patients with chronic pyelonephritis due to VUR, renal function are impaired gradually. Therefore early diagnosis of VUR is strongly requested. In the past, chief advantage of intravenous pyelography is that it permits visualization of the urinary tract, however is limited for visualization of renal parenchyma.

In this study, value of renal imaging by  $^{99m}\text{Tc}$ -DMSA was evaluated on patients with chronic pyelonephritis due to VUR.

The twenty one cases (29 kidneys) consisted of 15 females and 6 males ranging from 4 to 48 years old (mean 28.4 years old) were examined by  $^{99m}\text{Tc}$ -DMSA renal imaging.

Pho/Gamma IV with parallel hole high resolution and pinhole collimators was used. The images were obtained at 1 to 6 hours after intravenous injection of 1 to 5 mCi of  $^{99m}\text{Tc}$ -DMSA.

The grade of  $^{99m}\text{Tc}$ -DMSA renal imaging were compared with the grade of intravenous pyelography. Grade of renal images and intravenous pyelography were graded according to the following scales respectively:

Grade of  $^{99m}\text{Tc}$ -DMSA renal images: Grade 0 = normal renal image, Grade 1 = renal image normal in size with cold area (s), Grade 2 = small renal image with cold area(s).

Grade of intravenous pyelogram: Grade 0 = normal pyelogram, Grade 1 = caliceal clubbing without other findings, Grade 2 = caliceal clubbing and parenchymal scarring, Grade 3 = contracted kidney with clubbing and scarring.

The results were as follows:

- 1) In 18 kidneys with pyelogram grade of more than 2, all demonstrated cold area on renal image (scintigram grade more than 1).
- 2) The four kidneys out of 6 kidneys with pyelogram grade of 0 demonstrated cold area on renal image.
- 3) One of the 5 kidneys with pyelogram grade of 1 indicated grade 0 on renal image.

Therefore more abnormal lesions were found by  $^{99m}\text{Tc}$ -DMSA scintigraphy than by intravenous pyelography.

In summary, renal imaging by  $^{99m}\text{Tc}$ -DMSA were found to be useful aid for the diagnosis of renal parenchyma in cases with chronic pyelonephritis due to primary VUR.

### **Estimation of Renal Cortical Function Using $^{99m}\text{Tc}$ -DMSA and $^{197}\text{Hg}$ -Chlormerodrin**

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In clinical studies, the cortical morphology of the normal kidney appeared in the image as a thin peripheral rim of  $^{99m}\text{Tc}$ -DMSA activity,

while in the case of renovascular hypertension or hydronephrosis, cortical scars were clearly seen in the scintigrams as cortical images. Furthermore,