DIAGNOSTIC ABILITY OF HEPATOBILIARY SCINTIGRAPHY

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Summary

Morphological aspects of biliary images were observed by the hepatobiliary scintigraphy using $^{99m}$Tc-PI (pyridoxylidene isoleucine). Our study was made mainly on the diagnostic ability of the scintigram in various hepatobiliary diseases.

Diagnostic findings were observed in 53.8% of the cases with intrahepatic stones and all cases with cholangioma. In the stone of the common bile duct and extrahepatic biliary cancer, the diagnostic findings were observed in 42.3% and 37.5% respectively. Hepatobiliary scintigraphy was less reliable for the diagnosis of the lesions in the gallbladder.

The findings by hepatobiliary scintigraphy were as same as those by X-ray basically. In the cases showing the diagnostic finding by hepatobiliary scintigraphy, it seems to be possible to distinguish the stone from the cancer. Contrary to X-ray picture, scintigram is inferior in the image. So, it is necessary to perform ERCP or PTC to investigate fully the hepatobiliary lesions.

Key Words: hepatobiliary scintigraphy, gallstone, biliary cancer.

Introduction

Recently, $^{99m}$Tc-labeled substances as the new radiopharmaceuticals for the hepatobiliary scintigraphy have been developed. Especially, $^{99m}$Tc-labeled substances such as $^{99m}$Tc-PI (pyridoxylidene isoleucine)$^{1,2}$ or $^{99m}$Tc-HIDA (N-substituted iminodiacetic acid)$^3$ are excellent for the visualization of the biliary system. The purpose of the present study is to evaluate the diagnostic ability of the hepatobiliary scintigraphy using $^{99m}$Tc-PI in various hepatobiliary diseases.

Materials and Methods

Ninety one cases including 20 cases with cholelithiasis, 26 cases with choledocholithiasis, 13 cases with intrahepatic stones, 5 cases with cholangioma, 14 cases with cancer of the gallbladder, 8 cases with extrahepatic biliary cancer and 5 cases with pancreatic head cancer were employed for this study. The diagnosis of them was established by operation or autopsy.

As for the method, 5 mCi of $^{99m}$Tc-PI was injected intravenously to the patients in the fasting state. The pictures were taken every 5 minutes after the injection of the radioisotope in the front image up to 30 minutes, and thereafter, three times, 30 minutes, 60 minutes and 90 minutes in three positions, front, first and second oblique. As a rule, 15 mg of pentazosin...
was injected intramuscularly to the patient 15 minutes before the test.

To confirm the abnormal findings obtained by this scintigram, computed tomography (CT), endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous transhepatic cholangiography (PTC) were employed.

Results

1. Biliary image of gallstone

Out of 20 cases of cholelithiasis, 2 cases showed the circular filling defect in the gallbladder. Gallbladder was not visualized in 10 cases leaving the image of the bile duct clear. Nothing was visualized in a case, and other 7 cases did not show any abnormality.

In 26 cases with choledocholithiasis, 11 cases showed the abnormal findings in the common bile duct. Slit-like defect (Fig. 1, top) and circular filling defect (Fig. 1, bottom) were observed in 8 and 3 cases respectively. In the remaining 15 cases, nothing was visualized in 2 cases, and 13 cases did not show any abnormal findings or showed non-specific findings such as the delay in excretion of the contrast media from the common bile duct or dilatation of the bile duct.

In the intrahepatic stones, 7 out of 13 cases showed distinctly abnormal findings, in which 2 cases showed the duct-like defect in the liver (Fig. 2), and other 5 cases the shadow defect of the intrahepatic bile duct with dilatation of the distal tree (Fig. 3). No abnormal findings were observed in 4 cases whose stones were smaller and localized in the right lobe. In the remaining 2 cases, scintigram showed non-specific abnormalities such as the delay in excretion of the

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Fig. 1. Choledocholithiasis. The top shows the slit-like defect and the bottom the circular filling defect in the common bile duct respectively. Large stone in the common bile duct is observed clearly by ERCP.

Fig. 2. Intrahepatic stones. The duct-like defect is seen in the left lobe of the liver. The right bottom shows the X-ray by ERCP of the same case. The left bottom shows the image of the intrahepatic biliary tree after having removed the stones by surgery.