I. Digestive Tracts
(GI Tract and Pancreas)

Pancreas Scintigraphy Using “Area of Interest” (Second Report)

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At the twelfth annual meeting we reported the clinical usefulness of pancreas scintigraphy using “Area of Interest (AOI)”. The present paper concerns with a study of scintiphotos of the pancreas phantom using AOI and the results of 178 patients.

A pancreas phantom was made according to the measurement of normal pancreas of 111 corpses. Various columnar Mix-Dp targets were placed in the head, body and tail of the phantom. A liver phantom was prepared as the major background. The pancreas phantom was submerged in $^{75}$Se-selenomethione solution to simulate the normal ratio of radioactivity of the pancreas, liver and background. After pancreas images in AOI were confirmed by a persistence scope, Polaroid scintiphotos were obtained with $6 \times 10^4$ counts in each exposure. The exposures with AOI improved the resolution of a 15 mm diameter target better than those without AOI. A 10 mm target in the tail was suggestively seen in scintiphotos with AOI. But it was concluded that a 15 mm diameter target was the smallest one detectable. Without AOI, scintiphotos diagnosis was difficult in 25 of 48 patients with 200–250 $\mu$Ci $^{75}$Se injected. With AOI, in contrast, the readout was difficult only in 18 of 130 cases with 150 $\mu$Ci $^{75}$Se.

Conclusion: With AOI, more distinct scintiphotos were obtained in patients with lesser doses of 150 $\mu$Ci $^{75}$Se given intravenously. Clinically, it seemed possible to detect tumors as small as 15 mm in diameter. Pancreas scintigraphy using AOI is superior to the conventional one because of the lesser dose of $^{75}$Se required, thus a higher radiation safety and more distinct pancreas images.

Clinical Evaluations of Pancreas Scintigram

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During the past 2 years, we have carried out the pancreatic scintigraphy of 170 patients suggestive of pancreatic disorder.

Method: Scinticamera (102 type, toshiba) with 1,000 paralleled hole collimator was used. Serial scintigrams were obtained at 30 and 60
min. after the injection of selenomethionine of 250 μCi.

Result:
(1) Normal pancreatic configuration in 86 cases was pistol shape (32.5%), horseshoe shape (31.3%), high transverse shape (17.4%), sigmoid shape (10.4%), and dumbbell shape (8.0%).
(2) Scintigraphically, pancreas image was overlapped with the hepatic image in 66 of 86 cases (76.8%).
(3) Diagnostic category of pancreas scintigram was divided into 4 types by generalized reductions in uptake throughout the gland: Type I (severe), Type II (moderate), Type III (mild), Type IV (normal).
(4) Ninety Percent (9 of 10 cases) of pancreas carcinoma was diagnosed as Type I, II, and 24% (3 of 12 cases) of chronic pancreatitis was also the same type.

The Scintigraphy of the Carcinoma of the Pancreas in the Radically Removed Cases

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Several approaches are now available for detecting the pancreas tumors, such as the hypotonic duodenography, intravenous cholangio-cholecystography, endoscopic pancreatico-cholecystography, angiography, and scintigraphy. But it usually happens to find far advanced and non-removable carcinomas of the pancreas even with these artful approaches.

The purpose of this report is to specify the scintigraphic features of the carcinoma of the pancreas which had been radically removed, and to evaluate the pancreas scintigraphy for detecting such early carcinomas.

Seven cases with the carcinomas of the pancreas which had been radically removed were reviewed. They consist of 3 carcinomas of the head of the pancreas, 2 carcinomas of the body and tail of the pancreas, and 2 carcinomas of the periampullary area of the pancreas. All of these carcinomas were less than 5 cm in diameter. They were histologically adenocarcinomas except one case of the embryonal carcinoma. Their final diagnoses were principally obtained by the cholangiography. The scintigraphic findings of those cases were the limited defects in the pancreas, loss of sharpness of the pancreas outline, irregularly narrowing of the pancreas, and the complete loss of pancreas image. Among these findings, the limited defects in the pancreas and the complete loss of the pancreas images strongly suggest the presence of the carcinoma in the pancreas. The other findings, however, do not specifically suggest the carcinoma. They also suggest the chronic pancreatitis. In order to detect the carcinoma of the pancreas in early stage, therefore, one must suspect presence of the carcinoma and go further investigation even though the scintigraphic findings indicate the