

## Early Diagnosis of Pancreatic Cancer Report of Five Cases of the Small Pancreatic Cancer

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Received for publication, February 8, 1984

Eighty-nine cases of pancreatic cancers were experienced during the last 12 years. Among them, 5 cases (5.6%) were small pancreatic cancer (below 2cm in diameter); 3 cases were pancreas head cancer, 1 case body cancer and 1 case tail cancer. These cancers were all resectable. The patient of the small pancreatic cancers were survived comparatively long; the average period was 18 months. All of the 3 cases of pancreas head cancers were started with jaundice, 1 case of body cancer was started with elevation of urinary amylase output and 1 case of tail cancer was started with continuously high level of serum amylase value indolently. In this report, the 5 cases of small pancreatic cancers as well as the positive rate of laboratory data are first outlined. The clue for diagnosis and the details are stated herewith, and regarding a patient of body cancer (2.0×1.5 cm) who survived comparatively long for 36.3 months after surgery and also a patient of tail cancer (0.7×0.6 cm) who, 45 months after surgery, is still survived without relapse.

Key Words: Early diagnosis, Pancreatic cancer, ERCP, Small pancreatic cancer, Serum and urine amylase level

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## INTRODUCTION

With the progress of diagnostic methods of pancreatic diseases, the detection of pancreatic cancers has become comparatively easier lately. However, the progress has not contributed much to the advance in treatment, since most of pancreatic cancers were, when detected, progressive and thus unresectable. In 1969, the endoscopic retrograde cholangiopancreatography (hereinafter ERCP) was developed and put into clinical<sup>1-3)</sup> use. Since then, the diagnostic capabilities of pancreatic cancers have made rapid progress. However, no such favorable results of surgery as first anticipated have been obtained.<sup>4)-6)</sup> The number of death from pancreatic cancers, with ranks 4th after that of gastric cancers, lung cancers, and hepatocellular carcinoma<sup>8</sup>, tends to be on the rise year after year. These days, the ultrasonic diagnostic method and the CT scanning method are widely used. These methods are, however, not help for detection of small pancreatic cancers which less than 2cm in diameter, particularly of small body and tail pancreatic cancers. Extremely few authors have reported on them.<sup>7)-12)</sup> For early diagnosis of small pancreatic cancers, daily practice, with attention paid always on pancreatic cancers, is primarily important. However, the correlation between the initial symptoms patients of pancreatic cancers show and laboratory findings is non-specific, chiefly causes a delay in the early diagnosis of pancreatic cancers. Importance is, for better therapeutic results of pancreatic cancers, how efficiently we should get the clue for the diagnosis of small pancreatic cancers less than 2cm in diameter.

## SUBJECT

Subjects were 89 cases of pancreatic cancers confirmed histologically by surgery or autopsy from among the 95 cases of malignant pancreatic tumors which we experienced at Second Dept. of Internal Medicine, Nagasaki University School of Medicine and Second Dept. of Internal Medicine, Medical College of Oita during the last 12 years (Table 1). Table 2 shows the rate of resection by lesion for these cases; 9 (22.5%) out of 40 cases of pancreas head cancers, 6 (16.2%) out of 37 cases of body and tail cancers, and 12 cases of diffuse cancers; all of the cases being unresectable. Among the total 89 cases, 5 cases (5.6%) had small pancreatic cancers less than 2cm in diameter; all the cases being resectable.

Table 1. Cases of the pancreas tumors

Pancreatic cancer	89 cases ( 93.8%)
Pancreatic isletcell tumor	3 cases ( 3.1%)
Pancreatic cystadenocarcinoma	3 cases ( 3.1%)
total	95 cases (100.0%)

(1970. April-1982.October)

**Table 2.** Cases of pancreatic cancer and resectability

	case number (frequency)	resectable cases (rate)
head	40 ( 44.9%)	9 ( 22.5%)
body & tail	37 ( 41.6%)	6 ( 16.2%)
diffuse	12 ( 13.5%)	0 ( 0%)
total	89 (100.0%)	15 ( 16.9%)

### ANALYSIS OF SMALL PANCREATIC CANCERS

Five cases of small pancreatic cancers less than 2cm in diameter are outlined in Table 3; 4 male and 1 female patient with average age at 54 years old. By lesion, 3 cases were pancreas head cancers, the diagnosis of which was started by jaundice. One case was pancreas body cancer, the diagnosis of which was started by elevation of the

**Table 3.** Cases of small pancreatic cancers (below 2 cm in diameter)

No	sex	age	position	size	clue of the diagnosis	operation method	prognosis (cause of death)
1	M.	64	body	2.0×1.5	urine amylase output	D. P.	36.3M.(relapse)
2	F.	68	head	2.0×1.5	jaundice	P. D.	0.2M.(bleeding)
3	M.	35	head	1.6×1.4	jaundice	T. P.	10.9M.(relapse)
4	M.	58	tail	0.7×0.6	serum amylase	D. P.	45.0M.(survived)
5	M.	45	head	2.0×1.0	jaundice	T. P.	0.8M.(bleeding)

\*size: cm \*\*D.P.: distal pancreatectomy P.D. :pancreatoduodenectomy  
T.P.: total pancreatectomy

**Table 4.** Laboratory data in cases of small pancreatic cancer

No	position	size	CEA	urine amylase output	serum amylase	50gOGTT	T.bil.	Al-phos
1	body	2.0×1.5	(-)	(+)	(-)	(+)	(-)	(-)
2	head	2.0×1.5	(-)	(-)	(+)	(+)	(+)	(+)
3	head	1.6×1.4	(-)	(+)	(+)	(-)	(+)	(+)
4	tail	0.7×0.6	(-)	(+)	(+)	(+)	(-)	(-)
5	head	2.0×1.0	(-)	(+)	(+)	(-)	(+)	(+)
positive rate			0/5	4/5	4/5	3/5	3/5	3/5

\* size: cm

urinary amylase output, and one case was pancreas tail cancer, the diagnosis of which was started by elevation of the serum amylase level and urinary amylase output. Table 4 shows laboratory findings on 5 cases of small pancreatic cancers, no cases showed positive serum CEA values; the urinary amylase output and serum amylase value were positive in 4 (80%) out of 5 cases, and 50g OGTT was positive in 3 (60%) out of 5 cases. Positive value of the total serum bilirubin and alkaline phosphatase were found only in 3 cases of pancreas head cancer, and no anomalous values were found in the body and tail cancers. Summarized herein are on patient of small pancreas body cancer who alived comparatively long, and also one patient of small pancreatic tail cancer who had survived 45 months after surgery without relapse.

## CASE REPORT

**Case 1;** A 64-year-old male

*Chief complaint:* Obtuse pain in the left hypochondrium

*Past history:* He was diagnosed of wet pleurisy 20 years ago.

*Present illness:* In early June 1978, he felt the sensation of fullness from epigastrium down to the left hypochondrium. In July, he had an obtuse pain in the same regions and a burning sensation in the left side of his back. Upper G-I tract series showed no abnormal findings, and he was admitted for further examination.

*Present status:* No jaundice and anemia were found. No tenderness and mass were palpabel in the abdomen. The liver was palpabel 1/2 fingerbreadth below the right costal margine, smooth and of normal consistency. Splenic dullness were slightly enlarged.

*Laboratory findings:* Urinanalysis and stool examination showed no abnormal findings, and



**Fig. 1.** ERCP of case 1 demonstrated a cut off of the pancreatic duct at the body of the pancreas. Pancreatic cancer was suspected.

the liver function was proved normal by biochemical analysis. CRP was negative. The serum amylase and CEA level were normal at 280 I.U./l and 1.0ng/ml respectively. 50g OGTT showed the boundary type. The oneweek long test of urinary amylase output showed markedly high levels for 6 days. Some pancreatic disorder was suspected and ERCP was performed (Fig. 1). ERCP demonstrated a cut off of the pancreatic duct at the body of the pancreas. Pancreatic cancer was suspected and distalpancreatectomy of body and tail was performed. It was small pancreatic cancer with the size of 2.0×1.5cm, histologi-

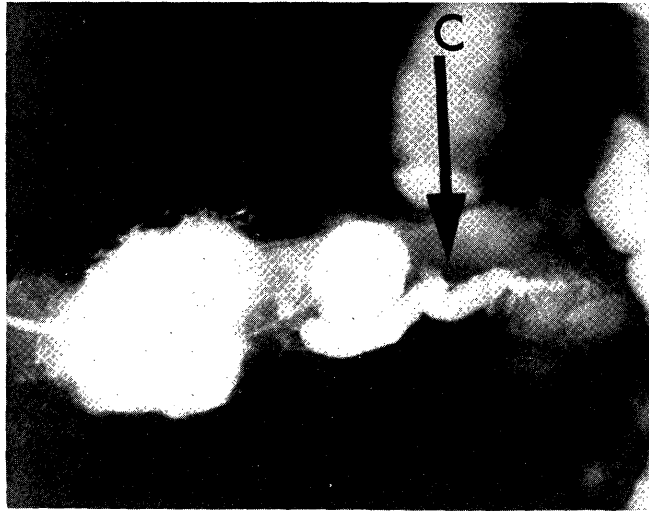


Fig. 2. Pancreatography of the resected pancreas of case 1. Severe pancreatitis accompanied by the cyst at the body and tail was seen. A: Stenosis due to pancreatic cancer. B: Pancreatic cyst. C: Histological specimen was taken at an arrow C (revealed Fig. 3).

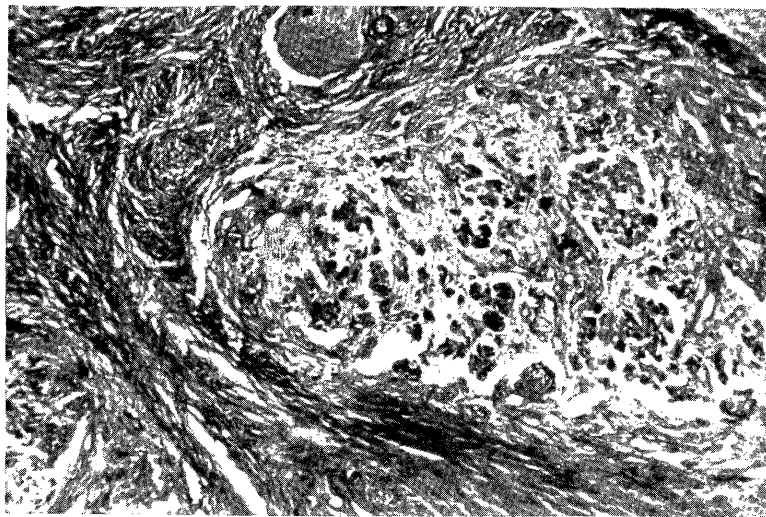


Fig. 3. Histological findings at the pointed region of arrow C (Fig. 2) shows chronic pancreatitis with severe interlobular fibrosis (case 1).

cally being well differentiated adenocarcinoma. Fig. 2 shows the pancreatography of the resected pancreas. Severe pancreatitis accompanied by the cyst at the body and tail was seen in this picture. The histological findings of the pointed region by an arrow C is shown in Fig. 3. The findings were chronic pancreatitis with severe interlobular and intralobular fibrosis. In this case, the cues that lead to the diagnosis of pancreatic cancer was the elevated urine amylase output due to the accompanying pancreatitis by the carcinomatous stenosis of main pancreatic duct. The patient died 36.3 months after surgery due to the relapse.

**Case 2;** A 58-year-old male

*Chief complaint:* General malaise

*Past history:* He was admitted for treatment of pulmonary tuberculosis in 1971.

*Present illness:* He noticed general malaise and anorexia from around April 1979 and was admitted for further examination and treatment of hepatitis since liver function test showed abnormalities. No abdominal pain was noticed during the hospitalization, and laparoscopic findings and liver biopsy determined the diagnosis of chronic active hepatitis.

*Present status:* No anemia and jaundice were found. The abdomen was flat and soft, liver, spleen, and kidney were not palpable. Laboratory findings: Serum GOT and GPT level being slightly elevated to 88 and 77 respectively. The serum amylase level which was normal on admission showed marked elevation later (Fig. 4). Hyperamylaseuria was

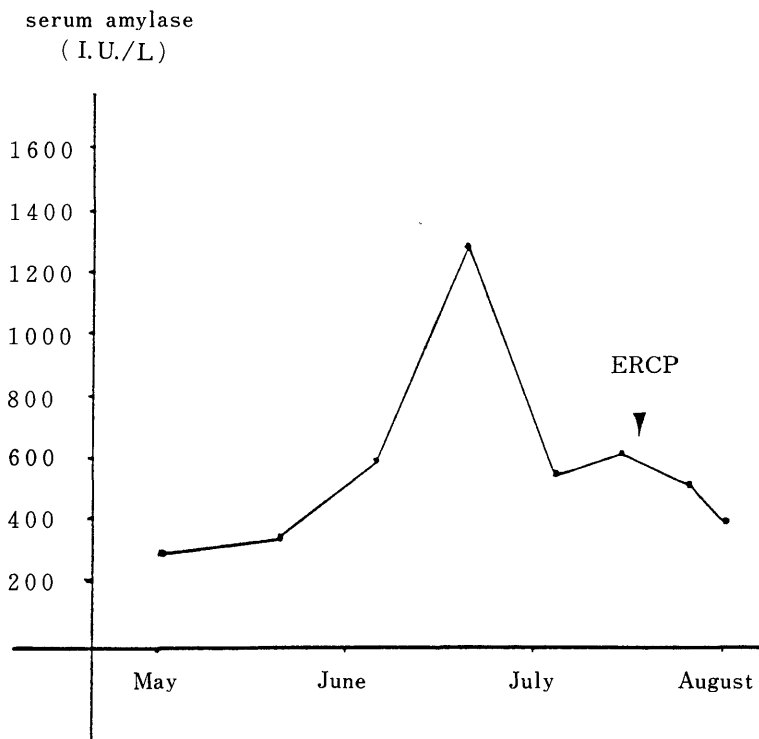


Fig. 4. Clinical course of serum amylase value. All of the clinical course was indolent. (case 2)

confirmed from the urine amylase output. The serum CEA value were normal at 2.1ng/ml and 50g OGTT showed the boundary type. Pancreatic disease was thus suspected and ERCP was performed (Fig. 5). ERCP revealed severe stenosis at body of the pancreas, and the marked dilatation of main pancreatic duct and branches was found at the tail of the pancreas. Pancreatic cancer was suspected and distal pancreatectomy of the body and tail was performed. Fig. 6 shows pancreatography of the resected pancreas. Histological findings of the part of arrow A showed severe chronic pancreatitis, but not of carcinoma (Fig. 7). Fig. 8 shows histological findings of the point of arrow B-E. The histology showed hyperplasia of the epithelium of the pancreatic duct which became severe toward the pancreas tail, and well differentiated adenocarcinoma was found at the region point-

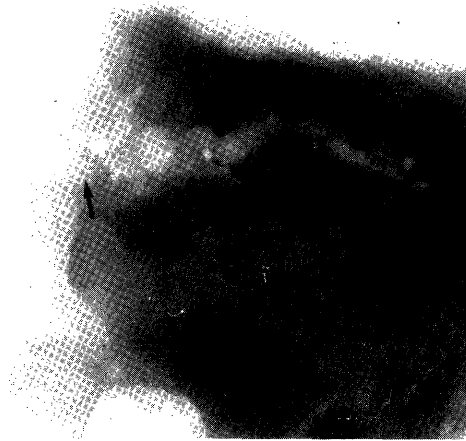


Fig. 5. ERCP revealed severe stenosis at the body of the pancreas (pointed arrow), and the marked dilatation of main pancreatic duct and branches was found at the tail of the pancreas.

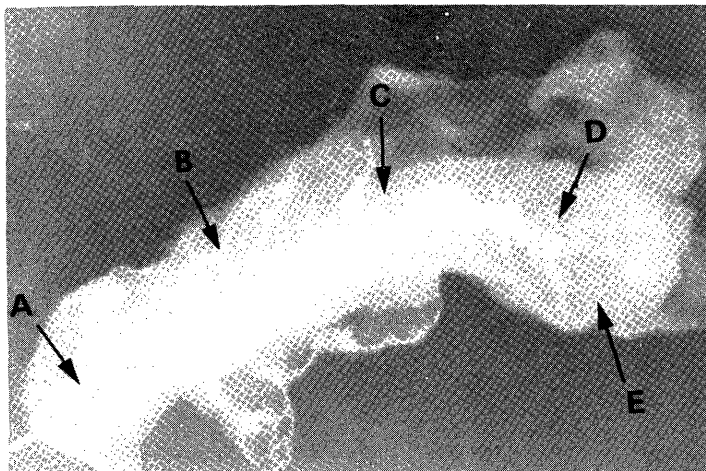


Fig. 6. Pancreatography of the resected pancreas (case 1). Histological examination were done at the arrow of A,B, C, D, and E.

ed by the arrow E. Fig. 9 shows the sliced specimen of the region pointed by the arrow E. It was small pancreatic carcinoma with the size of  $0.7 \times 0.6$  cm. In this case, severe

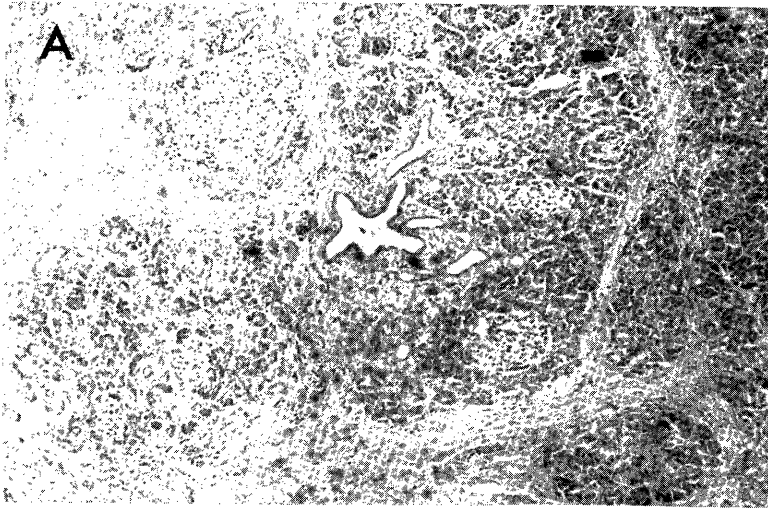


Fig. 7. Histological findings of the part of arrow A (Fig. 6) showed severe chronic pancreatitis, but not carcinoma.

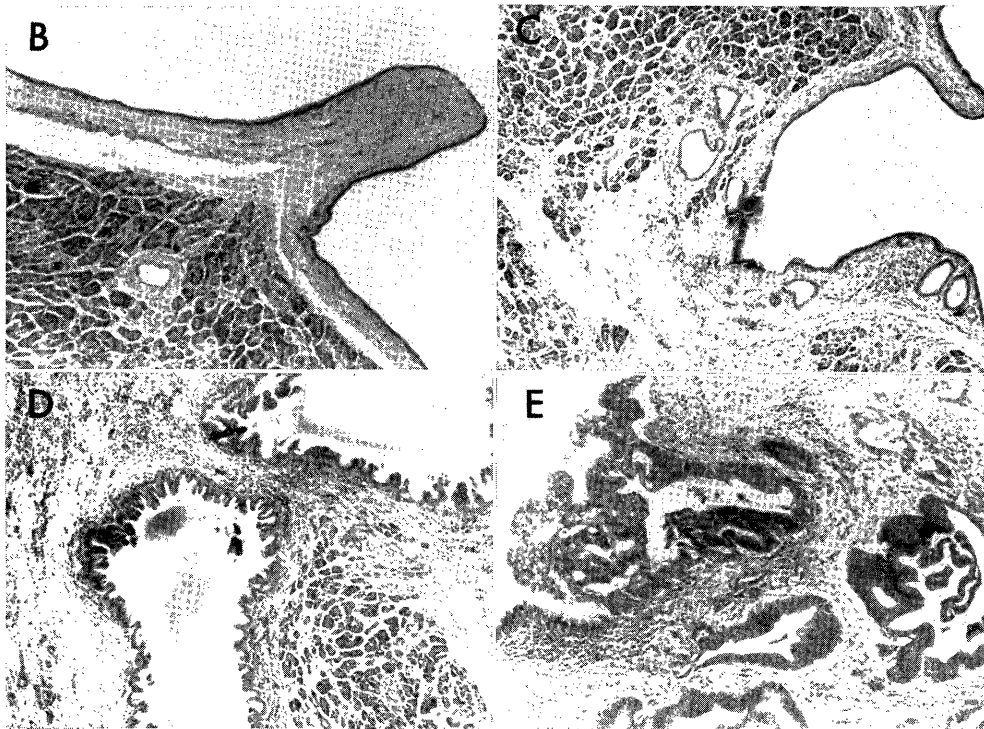


Fig. 8. Histological findings of the part of arrow B-E (Fig. 6). The histological findings showed hyperplasia of the epithelium of the pancreatic duct which became severe toward the pancreas tail, and well differentiated adenocarcinoma was found at the pointed region of arrow E (Fig.6) (case 2).



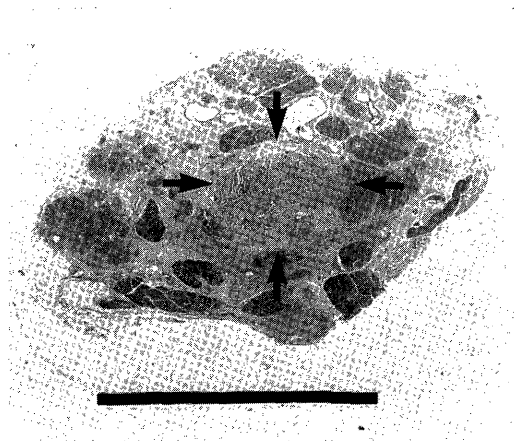


Fig. 9. The sliced specimen of the part of arrow E. Well differentiated adenocarcinoma was found inside of the small arrows. Under line indicates the length of 1 cm.

stenosis which was caused by pancreatitis was found in the main pancreatic duct, and the clues that led to the diagnosis of the pancreatic cancer was the elevated serum and urine amylase output due to the accompanying pancreatitis. It is interesting, in this case, that the hyperplasia of the epithelium of the pancreatic duct became severe toward the pancreas tail. The patient is still alive during 45 months after surgery without relapse.

## DISCUSSION

The diagnosis of pancreatic carcinoma has become comparatively easier with the clinical use of ERCP. However, most of carcinoma were, when detected, already progressive and result in poor prognosis. TAKAGI and ABE *et al.*<sup>8)9)11)</sup> reported that ERCP for cases of elevated serum and urine amylase was helpful for early detection of pancreatic carcinoma. The author and his colleagues<sup>13)</sup> also reported on the importance to measure the serum amylase level and urine amylase output as a screening method for early diagnosis of pancreatic carcinoma and explained that ERCP for those cases could give us a clue for early diagnosis of pancreatic carcinoma. Among 89 cases of pancreatic carcinoma in this studies, 5 cases of small pancreatic carcinoma less than 2cm in diameter had long average survival period of 18 months. Otherwise, as authors were previously reported<sup>13)</sup>, 84 cases of advanced pancreatic cancer which we experienced were very low rate of resection (16.9%), and average survival period was also very short (2.8 months). This suggests the importance of the diagnosis of small pancreatic cancer in less than 2cm to get better result of the surgery. Laboratory findings for the 5 cases of small pancreatic cancers revealed that total serum bilirubin and serum alkaline phosphatase levels, which were only positive in pancreas head cancer, are not significant as the screening method for early diagnosis of body and tail cancers. On the other hand, high

serum and urine amylase levels, which were positive in 4 (80%) out of 5 cases of small pancreatic cancer, are useful as a screening method. Several authors have lately reported on small pancreatic cancer, but almost all the cases were pancreas head cancer, and jaundice was the sign for diagnosis. Few reports are available on small pancreatic cancer of body and tail, but cases of long-term survival are very few. Among 89 cases of pancreatic cancer which we were experienced, laboratory findings and the clue for diagnosis on 5 cases of small pancreatic cancer less than 2cm in diameter have been reported. The importance to perform the measurement of serum and urine amylase levels, which can be done easily in daily clinical practice on cases with unidentified abdominal complaints, has been emphasized, and details were reported on one patient of pancreas body cancer who alived comparatively long after surgery. The correlation between the hyperplasia of the epithelium of the pancreatic duct and cancer which was shown in case 2, as reported by KOZUKA<sup>14)</sup> *et al*, PARVIZ<sup>15)</sup> *et al* and CUBILLA *et al*<sup>16)</sup> seems to be interesting to solve the mechanism of carcinogenesis of pancreas. (The summary of this studies was published at the 40th Kyushu Symposium of the Society of Gastreterology of Japan)

## REFERENCES

- 1) OI I; Endoscopic pancreatocholangiography. *Saishin Igaku* 25: 2292, 1970. (in Japanese)
- 2) OI I, KOBAYASHI S, KONDO T: Endoscopic pancreatocholangiography. *Endoscopy* 2: 103, 1970.
- 3) TAKAGI K, IKEDA S, NAKAGAWA Y, *et al*: Retrograde pancreatography and cholangiography by fiberduodenscope. *Gastroenterology* 59: 445, 1970.
- 4) HICKE RE, *et al*: Total pancreatectomy for ductal carcinoma, *Surg. Gynecol. Obstet.* 133: 16, 1971.
- 5) PLIAM MB, *et al*: Further evaluation of total pancreatectomy. *Arch. Surg.* 110: 506, 1975.
- 6) RE MINE WH, *et al*: Total pancreatectomy. *Ann. Surg.* 172: 595, 1970.
- 7) ARIYAMA J, *et al*: The diagnostic process of the small resectable pancreatic carcinoma. *I to Cho (Stomach and Intestine)* 15(6): 611, 1980. (in Japanese)
- 8) TAKAGI K, *et al*: Diagnosis of carcinoma of the pancreas For detection of small carcinoma *I to Cho (Stomach and Intestine)* 15(6): 595, 1980. (in Japanese)
- 9) TAKAGI K, *et al*: Small carcinoma of head of pancreas discovered by the clue of transitory elevation of urinary amylase level. *I to Cho (Stomach and Intestine)* 15(6): 637, 1980. (in Japanese)
- 10) GO, V. L. W., TAYLOR, W. F., DIMAGNO, E. P.: Efforts at early diagnosis of pancreatic cancer; The Mayo Clinic Experience. *Cancer* 47: 1698, 1981.
- 11) ABE M, *et al*: Early diagnosis of body of the pancreas. *Japanese journal of gastroenterology* 78(8): 1976, 1981.
- 12) MOOSSA, A. R., LEVIN, B.: The diagnosis of "early" pancreatic cancer; The University Chicago experience. *Cancer* 47: 1688, 1981.

- 13) NAKAMURA N, FUJIOKA T, *et al*: Screening method for detection of early pancreatic carcinoma. *The biliary tract & pancreas* 3(10): 1339, 1982. (in Japanese)
- 14) KOZUKA S, SASSA R, TAKI T, *et al*: Relation of pancreatic duct hyperplasia to carcinoma. *Cancer* 43: 1418, 1979.
- 15) PARVIZ, M POUR M. D., SOAD SAYED M. D., GABR SAYED M. D.: Hyperplastic, preneoplastic and neoplastic lesions found in 83 human pancreases. *Amer. J. Clin. Pthol.* 77(2): 137, 1982.
- 16) CUBILLA, A. L., FITZGERALD, P. J.: Morphological patterns of primary nonendocrine human pancreas carcinoma. *Cancer Res.* 35: 2234, 1975.