

## Ampullectomy of Carcinoma of the Papilla of Vater in an Elderly Patient without Jaundice

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### ABSTRACT

A 79 year-old woman was admitted to Aioi City Hospital for a closer examination of hepatic dysfunction. A filling defect was observed at the distal end of the intrapancreatic common bile duct by computed tomography combined with drip infusion cholangiography. The diagnosis of adenoma with dysplasia at the papilla of Vater was obtained by a biopsy performed during duodenoscopy. As a result, we performed an ampullectomy. Histologic examination revealed a papillary adenocarcinoma which partly extended just beyond the muscle of Oddi. The patient made an uneventful recovery and was discharged on the 35th postoperative day.

Here, based upon our experience, we discuss such problems as the accuracy of preoperative diagnosis and the indications for ampullectomy.

**Key words:** Periampullary cancer, Ampullectomy, Pancreatoduodenectomy

Recently, the age of patients is rising progressively. Consequently, it is becoming important to decide what kind of operative procedure should be selected for periampullary tumors.

Pancreatoduodenectomy (PD) is considered as the only possible curative treatment for cancer of the periampullary region<sup>2)</sup>. However, this major surgical procedure is associated with detrimental effects on the patient's health, namely, the occurrence of serious complications and the deterioration in the quality of life (QOL) after hospital discharge. Considering the above findings, local resection is considered to be a viable alternative to pancreatoduodenectomy for patients of advanced age.

We performed ampullectomy for a 79 year-old female patient with early carcinoma of the papilla of Vater. In this report, we present our experience concerning operative techniques, and discuss indications for the use of ampullectomy by comparing the present case with those reported previously.

### CASE REPORT

A 79 year-old woman was visiting Aioi City Hospital because of hypertension. Since an abnormal shadow was pointed out in the lung after a health screening, CT of the thorax was performed. Although both lungs were found to be normal, a

slight dilation of the intrahepatic bile duct was revealed. Her hepatic functions were found to be normal on blood biochemical tests. As a result, she was put under medical surveillance. As an hepatic dysfunction was recognized after five months, she was admitted to Aioi City Hospital for a closer examination.

The patient was 150 cm in height, 46 kg in weight and well nourished. The bulbar conjunctiva was not icteric. Operation scars were found on the right lower abdomen and the right shoulder. The chest was normal. The abdomen was flat and soft. The tumor was not palpable.

Laboratory data on admission (Table 1): The values of GOT, GPT and T.Bil. were within the normal limits, but the values of ALP and  $\gamma$ -GTP had increased markedly. The serum amylase level

**Table 1.** Laboratory data on admission

RBC	405 × 10 <sup>4</sup> /mm <sup>3</sup>	LDH	331 IU/litter
Hb	12.5 g/dl	ALP	1025 IU/litter
WBC	10000 /mm <sup>3</sup>	$\gamma$ -GTP	534 IU/litter
Plt	27.8 × 10 <sup>4</sup> /mm <sup>3</sup>	ChE	317 IU/dl
Glucose	149 mg/dl	T. Bil	0.7 mg/dl
(Fasting time)			
Total protein	7.6 g/dl	S-Amylase	77.0 IU/litter
GOT	32 IU/litter	CRP	1.0 mg/dl
GPT	45 IU/litter	CEA	4.7 ng/ml

was normal. The number of WBC and the value of CRP had increased slightly. Her fasting blood sugar was elevated moderately. The value of CEA

was in the normal range.

Ultrasonography: An enlargement of the gallbladder and a dilation of the common bile duct were found. Images reflecting the presence of a tumor at the distal end of the common bile duct were not obtained.

CT of the abdomen: A dilation of the common bile duct and an enlargement of the gallbladder were found. No tumor was detected at the distal end of the common bile duct by plain CT (Fig. 1-a) but its presence was enhanced by enhanced CT (Fig. 1-b). The tumor was revealed as a filling defect by drip infusion cholangiography (DIC)-CT (Fig. 1-c).

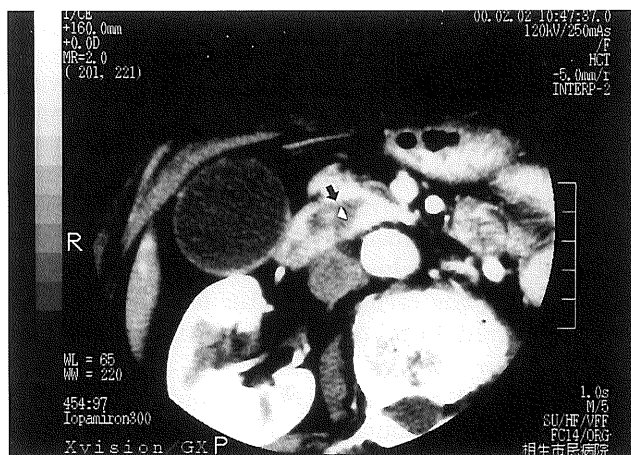
Endoscopic retrograde cholangiopancreatography (ERCP): The common bile duct was markedly dilated up to a maximum of 3cm in diameter and a filling defect was recognized at the distal end of the common bile duct (Fig. 2-a). The main pancreatic duct was free of stenosis, irregularity and dilation (Fig. 2-b).

Biopsy by endoscopy: The papilla was enlarged. The orifice of the papilla of Vater was of a red color and edematous. Its surface looked granular. A biopsy revealed the presence of adenoma with dysplasia. From the above findings, the presence of an adenocarcinoma was strongly suspected in the adenoma. We decided therefore to resect it. Ampullectomy was selected as the procedure, because the patient was 79 years old and her family preferred an operation with minimum operative damage.

Operative procedures and intraoperative findings: Laparotomy was performed through an upper midline incision. Both the common bile duct and the cystic duct were markedly dilated, the maximum diameter being 3.0 cm in the former



**Fig. 1-a.** Plain abdominal CT: A dilation of the common bile duct (arrow) and an enlargement of the gallbladder were shown.



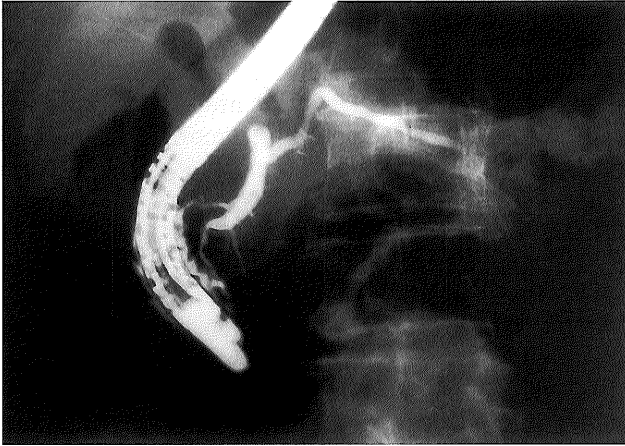
**Fig. 1-b.** Enhanced abdominal CT: A slightly enhanced tumor (arrow head) was detected at the distal end of the common bile duct (arrow).



**Fig. 1-c.** DIC-CT of the abdomen : The tumor was recognized as a filling defect (arrow head) at the distal end of the common bile duct (arrow).

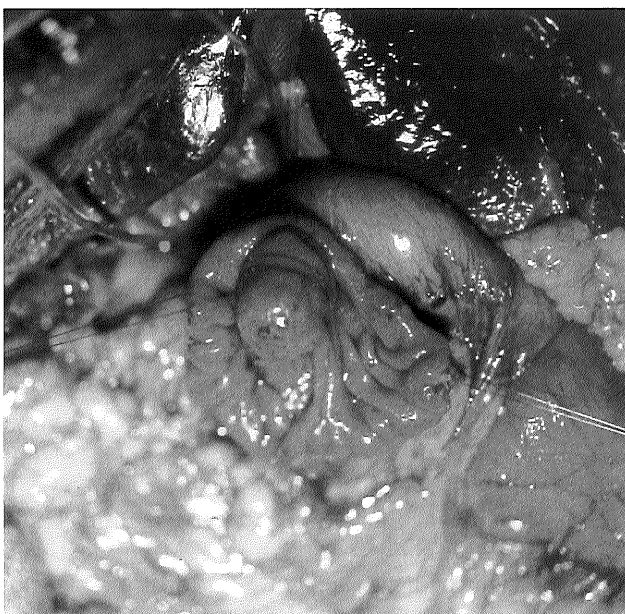


**Fig. 2-a.** A filling defect (arrow) was recognized at the distal end of the common bile duct by ERCP.



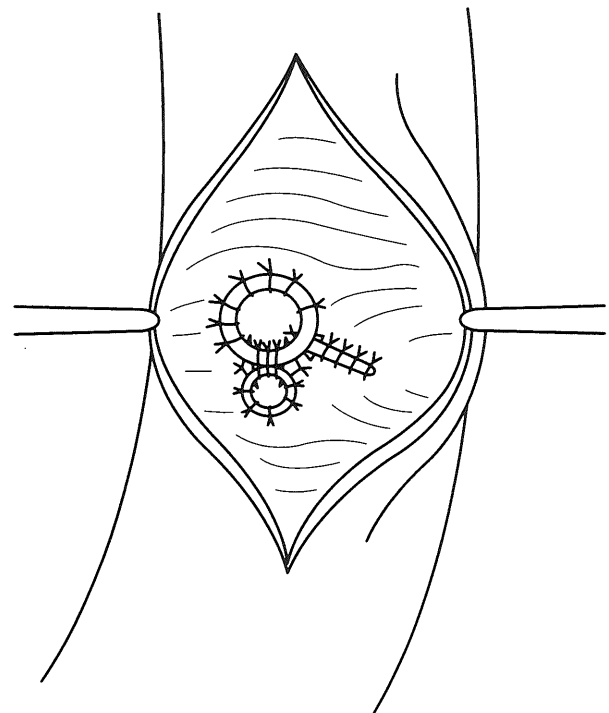
**Fig. 2-b.** No abnormal findings were observed in the pancreatic duct by examination with ERCP.

and 1.5 cm in the latter. After mobilization of the duodenum by Kocher's maneuver, cholecystectomy was performed. The tumor was observed from the inside with a choledochoscope introduced into the common bile duct through the cystic duct, and the absence of tumor extension to the intrapancreatic bile duct was confirmed. Then, a Nelaton catheter inserted into the cystic duct was advanced beyond the papilla of Vater down to the duodenum. The introduction of the catheter allowed the exact location of the papilla to be ascertained. A longitudinal duodenectomy 3 cm in length was performed opposite the region of the papilla. The papilla was enlarged but appeared to be covered with the normal duodenal mucosa. A part of the tumor was visible through the orifice as shown in Fig. 3. No lymphnode swelling suggestive of metastasis of

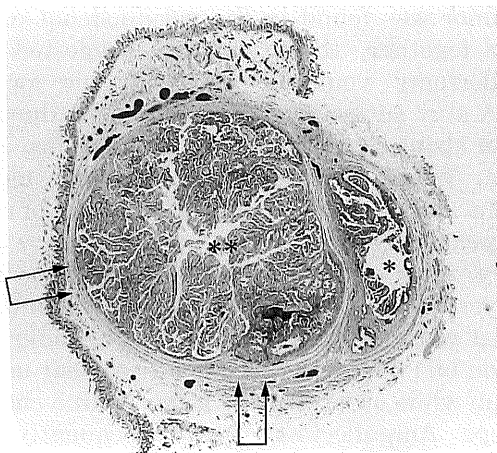


**Fig. 3.** An enlarged ampulla of Vater covered by duodenal mucosa was observed. A part of the papillary tumor was visible through the orifice of papilla Vater.

the tumor was found in the periduodenal region. Taken together, these findings suggested that ampullectomy would be most suitable for this case. A stay suture was placed into the duodenal mucosa about 2 cm proximally to the orifice of the papilla. While retracting the duodenal mucosa with the stay suture, the mucosal margin of resection measuring  $3 \times 1$  cm was marked with a cautery. After excision of the duodenal mucosa at the layer of submucosa, the common bile duct was exposed with the aid of a Nelaton catheter. The common bile duct was divided with a clear margin of 5 mm while observing the tumor with a choledochoscope. Ampullectomy was subsequently completed by exposing and dividing the main pancreatic duct. For reconstruction, first the common bile duct and the main pancreatic duct were sutured together with three stitches using 5-0 absorbable synthetic sutures. Thereafter, reconstruction was continued by approximating the posterior wall of the duodenum, including partially the muscularis propria of the duodenum, to the joined pancreatic and common bile duct openings. Then, the free cut-edges of the duodenal mucosa were sewn together as shown in Fig. 4. An 8 Fr atom-tube was placed in the common bile duct and extended outside the body through the cystic duct.



**Fig. 4.** Reconstruction of the divided ducts and duodenal mucosa: Reconstruction is started by approximating the common bile duct and the main pancreatic duct. Then, a circumferential approximation of the duodenal mucosa to the pancreatic and bile ducts is undertaken with absorbent monofilament sutures. Thereafter, the free cut-edges of the duodenal mucosa were sewn together.



**Fig. 5.** Histologic examination showed a papillary adenocarcinoma which extend to the intrapancreatic bile duct (\*\*\*) and the main pancreatic duct (\*). Invasion of the cancer just beyond the muscle layer of Oddi (arrow) was observed. (Haematoxylin and eosin,  $\times 4$ )

In addition, a 5 Fr tube placed in the pancreatic duct was extended outside the body through the anterior wall of the stomach. Finally, the duodenum was closed transversely.

Pathological examination (Fig. 5): The size of the tumor was  $3.0 \times 0.7$  cm. Histologic examination revealed a papillary adenocarcinoma which extended to the intrapancreatic bile duct and the main pancreatic duct. The invasion of the cancer minimally extended just beyond the muscle of Oddi. No cancerous cells were observed in the cut edges of the common bile duct and the main pancreatic duct.

## DISCUSSION

The clinical symptoms in this patient were nothing in particular. Usually, in patients with small ampullary tumors, no clinical symptoms are recognized. However, laboratory findings of increased serum bilirubin or alkaline phosphatase level or image findings of dilatation of the intrahepatic bile duct are observed frequently at this stage, as experienced in our case<sup>11</sup>. Although we were able to reveal a tumor at the distal end of intrapancreatic common bile duct by CT, generally it is difficult to reveal small tumors by imaging. Duodenoscopy with ERCP is recommended for the diagnosis. Endoscopic ultrasonography (EUS) presents high-resolution images of the ampulla, bile duct, pancreatic duct, pancreatic head, and neighboring lymphnodes. However, the definite representation of the muscle layer of Oddi is difficult to achieve. Itoh et al<sup>9</sup> reported the usefulness of intraductal ultrasonography (IDUS) for representing Oddi's muscle layer. On the basis of these reports, accurate judgement of tumor extension is considered to be possible by combined use of EUS and IDUS<sup>8,17,18</sup>.

The postoperative diagnosis was revealed as papillary carcinoma in the present case. Our experience suggests the necessity of intraoperative frozen section. Stolte et al<sup>16</sup> and Alstrup et al<sup>17</sup> reported that the incidence of tumors diagnosed as adenoma preoperatively by biopsy which turned out to be cancer postoperatively were 60% and 33% respectively. Considering these results, it is difficult to rule out malignancy even if the diagnosis of adenoma is obtained by preoperative biopsy.

The adenoma-carcinoma sequence is well known in cases of colon cancer<sup>12</sup>. The close relationship between adenoma and carcinoma has been reported by several authors in cancers of the papilla of Vater as well<sup>13,19</sup>. Consequently, much attention is being focused on adenoma as a premalignant lesion. According to Perzin et al<sup>13</sup>, cancer in adenoma was observed in 79 % of tumors of the papilla. Furthermore, the presence of adenomatous lesions near cancer lesions was reported in 18 % of cases by Yamaguchi et al<sup>19</sup> and 82% of cases by Kozuka et al<sup>11</sup>. In addition, the close relationship between adenoma and cancer is suggested by a study analyzing p-53 mutation in those tissues<sup>14,15</sup>. On the basis of these results, ampullary adenomas may be considered to be premalignant lesions. Therefore, it is important to excise at the adenoma stage, especially in cases accompanied by dysplasia. In the present case the coexistence of cancer was strongly suspected preoperatively because a biopsy showed the finding of adenoma with dysplasia.

As for the surgical treatment of tumors in the periampullary region, it is generally considered reasonable to select one of the following three operative procedures depending upon the characteristics and extent of the tumor: ampullectomy, for benign tumors; local resection which includes ampullectomy and local lymphnode dissection, for early cancer; PD, including pylorus preserving PD, for other cancers. PD is, therefore, most suitable as a radical treatment for cancers in the periampullary region. As a result, PD is preferable from the point of curability when the diagnosis of periampullary carcinoma is made<sup>2</sup>.

The mortality rate of PD performed in elderly patients ranges from 5 to 35%<sup>5,6</sup>. The rate of major postoperative complications ranges from 14 to 48%<sup>5,6</sup>. Mortality and morbidity rates reported so far vary widely among different authors. Although operative mortality for PD has declined in recent years, the safety of PD for elderly patients still has not been established. On the other hand, Knox and Kingston<sup>10</sup> reported a zero operative mortality rate following local excision. In addition, taking the QOL after hospital discharge into consideration, it seems preferable to select a less invasive operative method for elderly patients especially those with preoperative complications.

Endoscopic or surgical papillectomy was consid-

ered as a less invasive procedure. In this case, the tumor spread to the intrapancreatic bile duct, therefore complete resection of the tumor by endoscopic papillectomy seemed to be impossible<sup>4)</sup>.

The procedure of local resection for ampullary tumors was first described by Halsted in 1899<sup>7)</sup>. The prognoses of patients with small papillary carcinoma who underwent local resection compared favorably with the prognoses of those underwent PD<sup>3,10)</sup>. These literatures indicate that local resection is of some significance for certain cancer patients. A strict selection of patients suitable for local resection would be necessary to guarantee long-time survival. Patients with tumors of a papillary form may be indicated, because tumors of this kind have the tendency to remain the muscle layer of Oddi and are known to have a low incidence of histological lymphnode metastasis<sup>19)</sup>. If EUS and IDUS are used for preoperative examination, it is possible to perform a precise staging of the malignancy preoperatively<sup>8,17,18)</sup>.

We selected ampullectomy rather than PD for the following reasons. First, even if the cancer existed, the tumor is considered to be at an early stage from the papillary growth. Second, a high incidence of postoperative complications was predicted in view of the patient's advanced age and the preoperative complication of hypertension and diabetes mellitus. Furthermore, her family requested an operation with minimal damage to her physical condition.

When we observed that the tumor extended to the intrapancreatic bile duct, we made arrangements for an additional resection following the procedure of Yamamoto et al<sup>20)</sup>.

The patient made an uneventful recovery as the damage incurred by the operation was minimal.

The probability of the recurrence of cancer after local resection is considered to be higher than after PD. Therefore, a periodical follow-up is required using magnetic resonance and ERCP for tumor surveillance.

In conclusion, EUS and IDUS should be performed preoperatively to clarify the characteristics of ampullary tumor. Furthermore, intraoperative frozen section should be performed even in cases where preoperative biopsy has suggested a diagnosis of adenoma.

The indications for surgical ampullectomy are considered as follows. Surgical ampullectomy is deemed most suitable in cases where ampullary cancer is detected at an early stage, namely, when it is restricted to the inside of Oddi's muscle layer and there is no lymphnode metastasis, and local resection offers a good chance of cure. Moreover, local resection of malignant ampullary tumors may become palliative when the patient is unfit for PD because of advanced age or high operative risk.

(Received June 9, 2000)

(Accepted August 8, 2000)

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