

## A Case of Pancreatico-Colo-Cutaneous Fistula; Management Guided by Endoscopic Retrograde Cholangio-Pancreatography

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*A report of a 67-year-old man, who had been suffering from an enterocutaneous fistula after a left hemicolectomy due to colon cancer is presented. He had sudden intermittent upper abdominal pain and a high amylase level in the drainage fluid. The fistulogram showed a colocutaneous fistula with an abnormal cavity in the left upper quadrant. ERCP was performed to demonstrate the relationship between the pancreatic duct and the colocutaneous fistula connected with the abnormal cavity, and showed a pancreatico-colo fistula which was connected with the abnormal cavity. From the results of the above two studies, a diagnosis of the pancreatico-colocutaneous fistula could be drained, and a distal pancreatectomy, splenectomy and closing of the colonic opening were performed. After the operation, the patient was discharged without problem. We report herein a case of pancreaticocolocutaneous fistula which was confirmed by ERCP preoperatively and surgically treated successfully.*

**Key Words:** *Endoscopic retrograde cholangiopancreatography(ERCP), pancreas, colon, fistula*

### INTRODUCTION

**Pancreatic** fistulae may follow a variety of surgical procedures, including external drainage of the pancreatic abscess or cysts, enucleation of islet-cell tumors, or follow pancreatic resection(Poloyan et al., 1977), and the majority of pancreatic fistulae will close spontaneously with appropriate conservative therapy(Jordan, 1970).

However, pancreatico-colonic fistula is dangerous because the massive bacterial seeding that follows colonic perforation activates and potentiates pancreatic enzymatic activity and its proteolytic effect on tissue (Berne and Edmondson, 1966). With the introduction of endoscopic retrograde cholangio-pancreatog-

raphy(ERCP), many authors have reported its advantage for use in patients with pancreatic fistula(Poloyan et al., 1977; McLachie et al., 1985; Ihse et al., 1987). If the ERCP study is successful, not only may the site of the fistula be demonstrated or its probable origin identified, but based on the nature of the fistula, a rational decision can be made regarding the likelihood of spontaneous closure (poloyan et al., 1977). We report herein a case of pancreatice-colocutaneous fistula confirmed by ERCP preoperatively and surgically treated successfully.

### Case

A 67-year-old man was admitted to Severance Hospital, Yonsei University College of Medicine, under the suspicion of having an entero-cutaneous fistula. He was well 2 months earlier, when he experienced left lower quadrant pain. He visited a hospital where

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he underwent a left hemicolectomy and an end-to-end anastomosis under the diagnosis of colon cancer. Ten days after operation, an entero-cutaneous fistula was developed and the amount of fluid draining from the fistula was 50 ml/day. He received chemotherapy after the operation. Ten days before admission, sudden intermittent upper quadrant pain which worsened on coughing (admission, sudden intermittent upper quadrant pain which worsened on coughing) or change of position was noted. At that time, the fluid from the fistula changed from clear to fecal material with a foul odor. Thus, the patient was referred to this hospital. He complained that he lost 14 kg during the 3 months period.

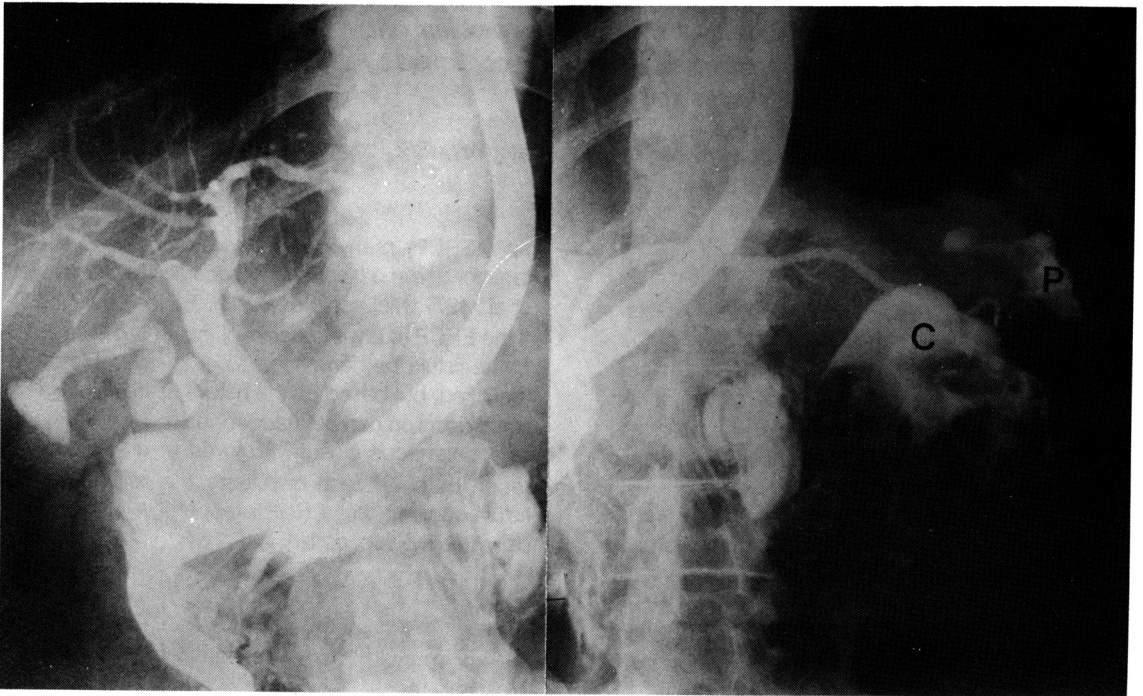
On admission, his temperature was 37°C, pulse rate was 92/min, respiration rate was 22/min, and blood pressure was 180/90 mmHg. He did not appear to be very ill. A long paramedian skin incision scar was noted on the abdomen. Foul odored purulent drainage was observed via the Nelaton's catheter which was inserted in the left lateral portion of the abdomen. Direct tenderness of the left upper quadrant abdomen was noted without palpable mass.

The hematocrit was 35.1 per cent, white-cell count was 4,900/mm<sup>3</sup> with 70 per cent neutrophils, 29 per

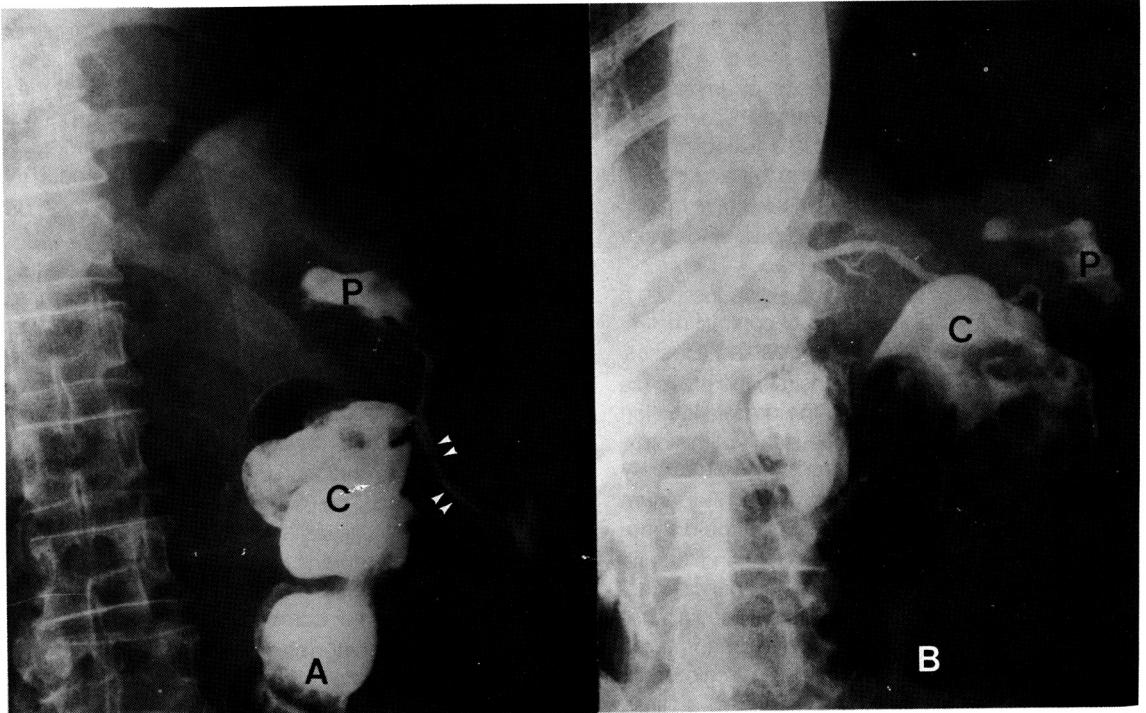
cent lymphocytes, and 1 per cent monocyte. *E. coli* was cultured from the drainage fluid of the fistula. Serum amylase level was 90 U/dl, and the amylase level in the drainage fluid was 7780 U/dl.

On the 1st admission day, a fistulogram was performed and showed a colcutaneous fistula with an abnormal cavity in the left upper quadrant (Fig. 1). To demonstrate the relationship between the pancreatic duct and the colo-cutaneous fistula connected with the abnormal cavity, endoscopic retrograde cholangiopancreatography (ERCP) was performed on the 7th admission day. ERCP showed a pancreatico-colo fistula which was connected with the abnormal cavity seen in the fistulogram with normal proximal pancreatic duct and normal bile duct (Fig. 2). From the results of the above two studies, a diagnosis of pancreatico-colo-cutaneous fistula could be made.

On the 5th admission day, the patient's fever increased to 38.4°C. At that the white-cell count rose to 19,300/mm<sup>3</sup> with 72 percent neutrophils. However, the fever subsided soon after the administration of antibiotics. On the 14th hospital day, an operation was performed. Entering the peritoneal cavity, the splenic flexure of the colon was found to be densely adhered to the fistulous tract. On dissecting the adhesion care-



**Fig. 1.** Fistulogram (A) showing a colo-cutaneous fistula (White arrow heads) connected with loculated area in the peritoneal cavity (P) and colon (C). Endoscopic retrograde cholangiopancreatogram (B) showing a normal main pancreatic duct, and extravasation of contrast agent into the free peritoneal cavity (P) and colon (C).



**Fig. 2,** Endoscopic retrograde cholangiopancreatogram showing a normal common bile duct, main pancreatic duct, and extravasation of contrast agent into the free peritoneal cavity (P) and colon (C).

fully, a small opening, 5mm in diameter, in the colonic wall was found and the colonic lumen was directly opened to the fistulous tract. Dissection of the fistulous tract revealed that it was adherent to the inferior portion of the distal pancreas. The distal pancreas was edematous and hyperemic but the pancreatic duct could not be identified. The colonic opening was sutured and a distal pancreatectomy with splenectomy was performed. The postoperative course was relatively smooth, and the patient was discharged on the 32nd admission day.

## DISCUSSION

The majority of pancreatic fistulae and follow a variety of surgical procedures (Poloyant et al., 1977). Less well recognized by clinicians are the fistulae that drain internally into the peritoneal or pleural cavities (Cameran et al., 1976; Moon et al., 1979), pericardium, gallbladder, stomach, jejunum, or colon (Davidson et al., 1979; Nix, 1981; Dean et al., 1980; Chaikhouni et al., 1980; Alsumait et al., 1978). External trauma was the most common cause of pancreatic fistula, and pancreatic fistula was the most frequent complication of pancreatic trauma (Jordan, 1970).

In Jordan's series (1970) of 101 consecutive pa-

tients with fistulas, the common causes were trauma, 44; pseudocysts, 27; pancreaticoduodenectomy, 16; pancreatitis, 5; excision of benign lesion, 4; pancreatic abscess, 1; and pancreatic biopsy, 1.

Colonic fistulization after pancreatitis usually occurs in a middle-aged man, often with a history of alcoholism, biliary disease, or recurrent attacks of pancreatitis, with an acute episode of a few weeks duration, manifesting fever, epigastric pain, nausea, vomiting, probably a tender palpable upper abdominal mass, leukocytosis, elevated bilirubin and normal serum amylase. The development of hematochezia, or an unusual rectal drainage of pus or liquid material in such a patient should arouse suspicion about colonic fistulization of a pancreatic pseudocyst, or abscess (Chaikhouni et al., 1980).

In our case, there was left upper quadrant abdominal pain and drainage of foul odored purulent material from the existing enterocutaneous fistula after the left hemicolectomy with end-to-end anastomosis due to colon cancer. There was no fever, leukocytosis, abdominal mass or hematochezia, and the serum amylase level was normal.

Pure pancreatic juice is clear or opalescent and is highly alkaline. The volume can be as high as 1800 ml/day with a pure fistula and even higher with a com-

bined one (Jordan, 1970). The concentrations of pancreatic enzyme vary from day to day and from patient to patient, and the presence of amylase or lipase verifies the presumptive diagnosis of pancreatic fistula. Electrolyte concentrations are variable; sodium is usually about 145 mEq/liter and the bicarbonate ion ranges from 30 to 80 mEq/liter (Baker et al., 1967). In our patient, 50 ml of fluid drained daily and it contained an amylase level of 7780U/dl.

External pancreatic fistulae can be diagnosed by a fistulogram, obtained by instillation of contrast material into the fistula from its external opening (Bockus, 1985). ERCP can not only demonstrate the presence of a fistula, but it can also show the precise location of ductal disruption as well as the status of the proximal duct, which may help to predict the probability of spontaneous closure (Poloyan et al., 1977). Barium or Gastrografin enema can be helpful in the diagnosis and localization of colonic fistulization, and the use of colonoscopy in cases with suspected pancreaticocolonic fistula may be helpful but hazardous (Chaikhouni et al., 1980). In our case, we first performed a fistulogram, which showed a cutaneous-colonic fistula, and then performed ERCP, which showed a fistula involving the main pancreatic duct and connected to the colon and skin. These results influenced us to proceed directly with surgical correction of the fistula.

The majority of pancreatic fistulae will close spontaneously with suspected pancreaticocolonic fistula may be helpful but hazardous (Chaikhouni et al., 1980). In our case, we first performed a fistulogram, which showed a cutaneous-colonic fistula, and then performed ERCP, which showed a fistula involving the main pancreatic duct and connected to the colon and skin. These results influenced us to proceed directly with surgical correction of the fistula.

The majority of pancreatic fistulae will close spontaneously with appropriate conservative therapy (Jordan, 1970). accordingly, a trial period of watchful is indicated (Bockus, 1985). Baker et al. (1967) demonstrated that atropine is effective in inhibiting pancreatic flow, but they could not confirm the usefulness of acetazolamide. Patients with small and moderate output fistulae will tolerate a regular diet without difficulty, but with high output fistulae, combined fistulae or if associated intra-abdominal problems are presented oral feeding is best managed with parenteral hyperalimentation or elemental diets (Dudrick et al., 1970; Kune et al., 1978; Voitk et al., 1973). Pederzoli et al. (1986) had been carried out upon 45 patients with a high output external pancreatic fistula with various methods and reported that patients treated with total parenteral nutri-

tion (TPN) plus intravenous infusion of somatostatin (8 patients) had the fistulas close (7 patients) within a significantly shorter period of time ( $6.57 \pm 2.99$  days) than TPN plus calcitonin (closure: 6 of 7 patients, period:  $23.16 \pm 19.61$  days), TPN plus glucagon (closure: 12 of 12 patients, period:  $29.58 \pm 15.32$  days) and TPN only (closure: 17 of 18 patient, period:  $31.82 \pm 21.08$  days).

There have been sporadic reports of fistula closure after radiation therapy (500 to 2000 rad) to the pancreatic bed, but the indications and utility of his modality remain to be defined (Culler, 1920; Morris et al., 1979; Greenwald et al., 1979). Baker et al. (1976) recommended that surgical closure be performed if a fistula continues to drain more than 1000ml/day for more than 60 days, or if major complications develop. The choice of surgical treatment of distal pancreatic fistula is distal pancreatectomy because the procedure is simple, good results are expected and pancreatic functions will be preserved normally. The major complications of the fistula are infection and hemorrhage; and once hemorrhage develops, the mortality is high (Jordan, 1970). In our case, pus was drained from the fistula but fortunately hemorrhage was absent.

In conclusion, we suggest that ERCP be considered in patients with suspected pancreatic fistula to confirm the fistula, and to decide the method of treatment, medical or surgical, and the operative method.

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