

Two Successful Cases of Treating the Severe Complications Caused by Post Pancreaticoduodenectomy Pancreatic Leakage

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ABSTRACT

AIM: Post pancreaticoduodenectomy (PD) pancreatic leakage can give rise to severe complications which have a close relationship with high mortality.

METHODS: Two post PD cases had pancreatic leakage which caused severe complications, such as severe abdominal infection, abdominal hemorrhage, and acute respiratory distress syndrome (ARDS). The patients underwent urgent abdominal exploration and pancreatojejunostomy site ruptures were found. The broken jejunum section was purse-sutured with a tube in it and the other end of tube was put out of abdominal cavity. A small catheter was put into pancreatic duct and the pancreatic juice was drained outside of the body.

RESULTS: The two patients had recovered from the severe complications. The pancreatic catheters were removed while no symptoms were seen. After several months' follow up, the patient had normal diet without any abdominal pain, distention and diarrhea. The blood sugar was normal. CT scan showed no tumor recurrence and metastasis.

CONCLUSION: Putting a small catheter in the pancreatic duct and letting the pancreatic juice out is a good way to treat severe post PD pancreatic leakage.

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Key words: Pancreaticoduodenectomy; Pancreatic leakage; Treatment

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INTRODUCTION

The incidence of post PD pancreatic leakage varies depending on the definition applied but is considered to be between 10% and 30%^[1]. Post PD pancreatic leakage is a severe complication, which can lead to severe abdominal infection, abdominal hemorrhage, intestinal fistula and vital organ dysfunction such as ARDS, septic shock *et al* Patients may have long hospital stay, high cost, severe sequelae, even death. Although the operative mortality after PD has significantly declined to 3 to 5%, pancreatic anastomotic leakage is associated with a mortality rate of 40% or more^[2-3]. How to treat post PD pancreatic leakage has always been much concerned. Recently, we have dealt with two severe post PD pancreatic leakage patients as follows:

CASE REPORT 1

A 66 years old male patient with ampullary tumor (Figure 1, figure 2) had undergone PD in the local hospital. At the 8th day post operation, the patient's abdominal incision was split with abdominal infection and he underwent the second operation. During the surgery, a small hole with the size of 1cm was found and fixed by suture according to the surgical record of the local hospital. Another 5 days later, the patient had tachypnea, cyanosis, and hypotension and was transferred to the surgical ICU in our hospital. At admission, the vital sign of that patient was: temperature: 37.4°C, R: 30 bpm, P: 90bpm, BP: 81/60mmHg. Turbid fluid was flowing out from the incision; fluid from drainage tube and T tube both had bile. The value of amylase from abdominal incision fluid was 9277u/L. Routine blood test showed WBC 23*10⁹/L, neutrophil 91%. Thoracic CT scan indicated large amount of high-density shadow in the lung and left pleural effusion (Figure 3). Abdominal CT scan suggested discontinuation at the site of pancreatojejunostomy (Figure 4). The patient's APACHE II score was 15. After admission, the patient had difficulty in breathing and arterial blood gas analysis showed the Po₂ was 50mm Hg and diagnosed as ARDS. The patient underwent urgent abdominal exploration and found dehiscence of

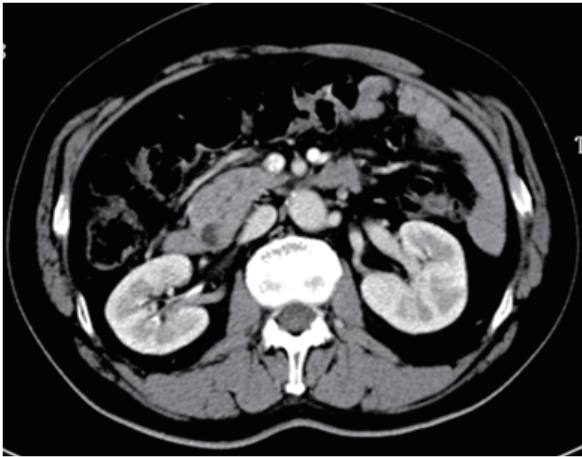


Figure 1 CT scan revealed a filling defect at the end of distal common bile duct.

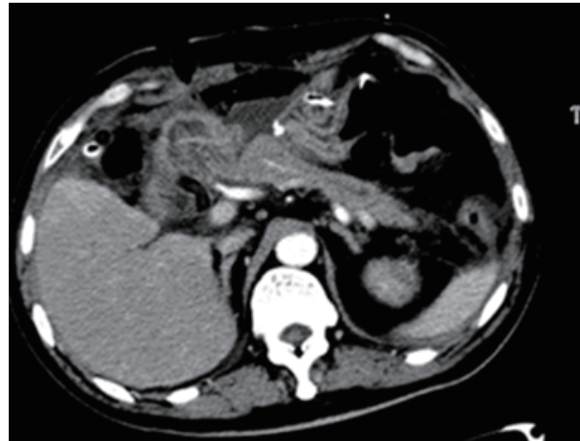


Figure 4 Abdominal CT scan suggested the site of pancreatojejunostomy was discontinuous.

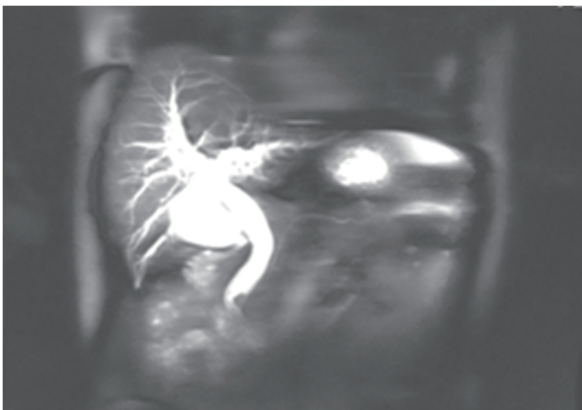


Figure 2 Magnetic resonance cholangiopancreatography showed a filling defect at the end of distal common bile duct and the biliary tree dilated.

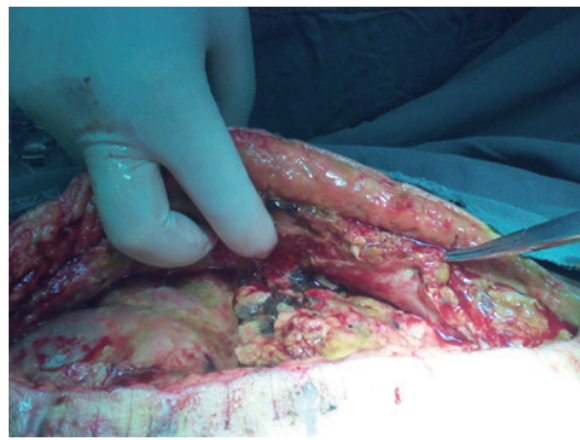


Figure 5 Abdominal fat tissue necrosis and intra-abdominal infection.



Figure 3 CT scan showed large amount of high-density shadow in the lung and left pleural effusion.

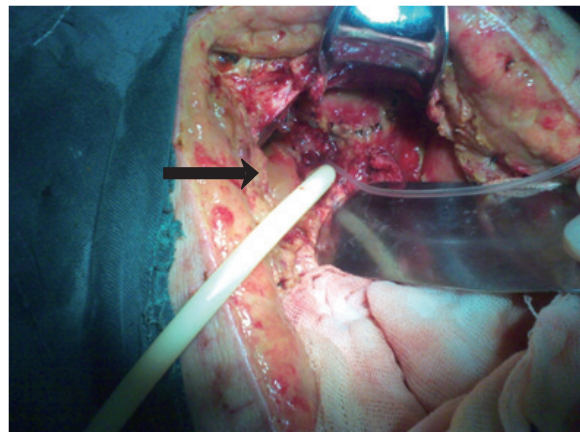


Figure 6 The broken jejunum section was purse-sutured with a tube in it and the other end of tube was put out of abdominal cavity (arrow). A small catheter size about 2mm was put into pancreatic duct and the pancreatic juice was drained outside of the body (arrowhead).

the pancreatjejunostomy, abdominal fat tissue necrosis and blood clot at lesser omentum (Figure 5). A small intestinal hole about 10mm was found directly under the incision, from which bile was flowing out. The site of hepaticojejunostomy was leaking, and the end-to-end pancreatojejunostomy with invagination had opened up. We flushed the abdominal cavity with saline water. The open end of the jejunum section was closed with a purse string suture with a tube in it and the other end of tube was put out of abdominal cavity. A small catheter size about 2mm in diameter was put into pancreatic duct and the pancreatic juice was drained outside of the body (Figure 6). We put another tube under the site of hepaticojejunostomy and put a double lumen cannula in the lesser omentum cavity for continuous flush and negative pressure drainage. After surgery, fluid resuscitation,

antibiotics, albumin, etc. were given to the patient. The pleural effusion was aspirated. The incision was opened again and dressing was changed every day (Figure 7). The patient was given nutrition from parenteral to enteral, until oral eating was possible. The patient's condition was gradually improved. Seventy six days after admission, the T tube was clamped, but the pancreatic catheter was still open with about 400 mL clear pancreatic juice flow out per day. Ninety five days after admission, the patient pulled the pancreatic drainage catheter out without caution and we put the small catheter

back from the fistula but could not put it in the previous place, only 10ml fluid drained out per day. Another 7 days later, no fluid drained out from the catheter and the patient didn't show any abdominal pain, distention and fever. Two weeks later, we gave patient contrast medium examination from T tube, which suggested patency and pancreatic catheter which was blocked (Figure 8). CT scan showed no positive findings in the abdominal cavity, we removed the T tube and pancreatic catheter. The patient's incision was healed (Figure 9). Six month later, the patient had normal diet, even with fatty food. The patient has no abdominal pain, distention and diarrhea. The blood sugar is normal. CT scan showed no tumor recurrence and metastasis. No pancreatic pseudocyst formed.

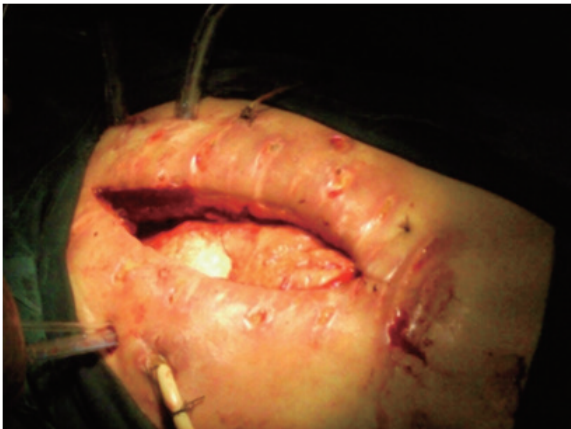


Figure 7 Abdominal incision was opened again and dressing was changed every day.

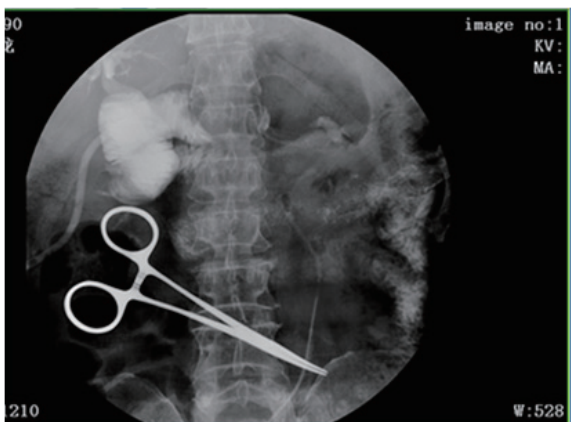


Figure 8 Contrast medium examination from T tube which suggested patency (arrow) and pancreatic catheter which was blocked.



Figure 9 The patient incision was healed.

CASE REPORT 2

A 75 years old male patient with mild abdominal pain and jaundice for one month diagnosed with tumor of ampulla underwent PD and an end-to-end pancreatojejunostomy was performed. After surgery, the patient had hematemesis, melena and light red fluid and bile juice coming out from drainage tubes. The value of amylase from abdominal fluid was 3974U/L. The patient was given fluid resuscitation, blood transfusion, antibiotics. In the 10th day after operation, the patient felt sudden severe abdominal pain, tachypnea and high fever with the temperature of 39.4°C. Physical examination showed full abdominal tenderness and muscle rigidity. The patient was immediately taken up for laparotomy and at the site of pancreatojejunostomy anastomotic rupture was found. A small vein at the end of jejunum was bleeding. The blood clot was filled in the lumen of afferent jejunum and fat tissue necrosis was found near the broken pancreatojejunostomy anastomotic site. We stitched the small bleeding vein and put a tube into the jejunum and purse string suture to the jejunum to close the opening. A small catheter was inserted into pancreatic duct which let the pancreatic juice flow outside of the body. A double cannula douche was put at the lesser omentum cavity for continuous flush and negative pressure drainage. Two other tubes were separately put at the site of hepaticojejunostomy and pelvic cavity for drainage (Figure 10). After the second surgery, albumin, antibiotics and nutrition support was given to the patient. Pleural effusion and abdominal fluid collection (Figure 11) were aspirated. The patient's temperature

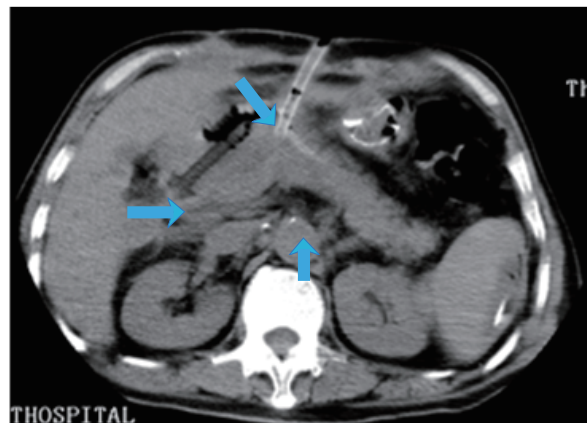


Figure 10 A tube was put into the jejunum and purse sutured to close the opening (arrow). A small catheter was inserted into pancreatic duct which let the pancreatic juice flow outside of the body (arrowhead). A double cannula douche (curved arrow) was put at the lesser omentum cavity for continuous flush and negative pressure drainage.

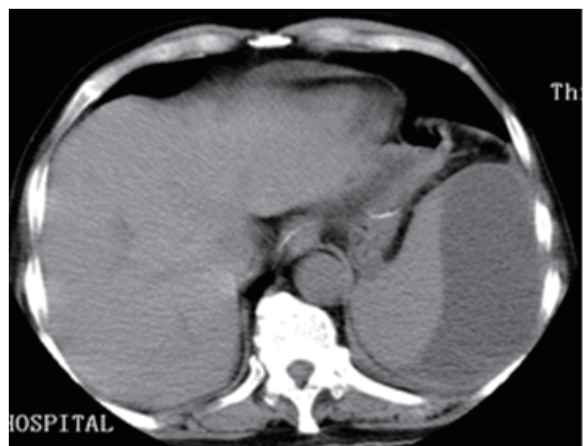


Figure 11 Abdominal fluid collection.

gradually decreased to normal and could take food orally. All the tubes were removed, except pancreatic duct catheter was kept with about 350ml clear fluid drainage per day. Five months later, the pancreatic duct was gradually retreated and was pulled out at last. In the 4 month follow up, the patient had normal diet, without abdominal pain, distension, and diarrhea. CT scan showed no tumor recurrence and metastasis.

DISCUSSION

In normal situation, pancreatic juice contains large amount of digestive enzymes which can help digest food. When pancreatic leakage occurs, the juice flows into abdominal cavity. The enzymes can be activated by bile or bacteria that can erode surrounding tissue leading to severe complications such as tissue necrosis, intestinal perforation, abdominal infection and hemorrhage^[4]. Afterwards, patients may have ARDS, septicemia, renal failure and so on, which threatens patients' life.

The way of treating pancreatic leakage

The pancreatic leakage post PD can give rise to severe complications which usually needs surgical intervention. In this situation, patients are often in critical condition, the surgical procedure should be effective, concise, causing less injury and shorter operating time. As the tissue is with high degree of edema, if the site of pancreatojejunostomy is broken, the attempt to repair it or re-anastomosis will be a failure. Putting a small catheter in the pancreatic duct and draining the pancreatic juice out can prevent its further erosion. Putting a tube into the end of jejunum to drain the intestinal juice and bile juice out can reduce fluid accumulation in the abdominal cavity. This method can prevent the subsequent complications such as tissue necrosis, intestine perforation, abdominal infection, hemorrhage. Although the two patients had severe complications caused by pancreatic leakage, they had good recovery by this method.

The use of double cannula douche

A double cannula douche at the lesser omentum cavity for continuous flush and negative pressure drainage can cure the existing abdominal infection. Because of the suction effect, the inflammatory fluid from necrosis tissue and a small amount of fluid from the possible leakage of pancreatic duct and jejunum will be sucked out, and no fluid can collect in the abdomen cavity, which can make abdominal infection easily controlled.

The management of pancreatic catheter

Pancreas has two major functions: endocrine function and exocrine function. The endocrine function is to secrete insulin, which keeps blood sugar in normal range. The exocrine is to help digestion of food.

In case 1, although the patient gradually recovered to the normal diet without abdominal pain, distension and steatorrhea, about 400ml clear pancreatic juice drained outside of the body per day. How can we treat it? We had considered injecting sclerosing agent to close pancreatic duct, but it may give rise to pancreatitis or pancreatic cyst. We also planned to perform pancreatic jejunum or stomach anastomosis, but it was a difficult procedure because of heavy adhesions. Fortunately, the patient's drainage tube dropped out of the body itself and we couldn't put it to the original position, the fistula closed and the catheter was pulled out. The patient had no symptoms. In 6-month follow up, the patient had normal diet without abdominal pain, distension and diarrhea. Abdominal CT scan showed no positive findings. In case 2, we tried gradually to retreat the pancreatic drainage catheter until it was pulled out at last. The patient's digestive function was also not affected and no other complications occurred. We didn't do any further management of the pancreatic stump of the two cases and it appears to be like a pancreatic duct occlusion method. So putting catheter into pancreatic duct and gradually pull it out can be a good way for treating the broken pancreatojejunostomy post PD, even if the patient had digestive problems, we can give them oral pancreatic enzyme drugs. Because the small sample size, the method still needs more patients to be observed to find whether if any complications may occur by pulling out the pancreatic drainage catheter.

CONFLICT OF INTERESTS

There are no conflicts of interest with regard to the present study.

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