

## THE APPLICATION OF PTCD IN PATIENT WITH MALIGNANT OBSTRUCTIVE JAUNDICE CAUSED BY LOW-GRADE PANCREATIC CANCER:A CASE REPORT

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### ABSTRACT

**Introduction:** Pancreatic cancer is a type of high-grade malignant tumor of digestive tract, which is difficult to diagnose and treat. The obstructive jaundice induced by pancreatic cancer may lead to hepatic failure and accelerated progress of disease. On this basis, percutaneous transhepatic cholangial drainage (PTCD) and biliary tract external drainage (BTED) can relieve the symptoms of obstructive jaundice induced by pancreatic cancer, and improve patients' disease condition their quality of life.

**Materials and method:** In this research, the selected pancreatic cancer patient (who had been misdiagnosed to take gallbladder- jejunum side to side anastomosis + jejunum-jejunum side to side anastomosis internal drainage rather than take pancreaticoduodenectomy, and refused to take surgical treatment again) suffered the complication of obstructive jaundice and serious infection. interventional therapies with PTCD and BTED were performed to relieve the symptoms of obstructive jaundice and control the infection.

**Results:** Through implementing interventional treatment of complications of pancreatic cancer, patients' life quality was improved and their life time was prolonged.

**Discussion:** We believe interventional therapy is a safe and effective Conservative treatment through this case study.

**Keywords:** Pancreatic Cancer, Obstructive Jaundice, PTCD, Palliative treatment.

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### Introduction

Pancreatic cancer is a malignant tumor of pancreas. For pancreatic cancer patients who refuse to take surgical treatment or whose tumor cannot be removed by surgery, chemotherapy achieves certain therapeutic effect; however patients with pancreatic cancer and obstructive jaundice cannot tolerate chemotherapy due to poor liver function. In this research, a patient with low-grade pancreatic cancer and obstructive jaundice who refused surgery or chemotherapy obtained sound therapeutic effect via interventional treatment.

### Case Report

The selected patient, male, aged 50, was admitted to hospital for skin and icteric sclera for

half month. According to the contrast-enhanced CT of upper abdomen, it can observe enlarged pancreas caput, lower bile duct obstruction, and intra-hepatic bile duct dilation. The abdomen ultrasound showed space-occupying lesion at pancreatic head region, pancreatic duct dilation, intra-hepatic bile duct dilation, and enlarged gallbladder.

*The laboratory results showed:* ALT 208U/L, AST 81U/L, TBil (total bilirubin) 273.8umol/L, DBIL(direct bilirubin) 167.2 umol/L, IBIL(indirect bilirubin) 106.6 umol/L, CA19-9 275.5U/ml, other indexes were within normal range. Therefore, the clinical diagnosis showed obstructive jaundice induced by pancreatic cancer. The patient was regularly healthy, without history of other systemic diseases, history of infectious diseases such as "hepatitis", history of trauma, history of surgery, or history

of food and drug allergy. No contraindications were observed in preoperative examination. During performing Roux-en-Y cholangiojejunostomy, it can observe liver cholestasis but no metastatic nodules, enlarged gall bladder (3cm\*10cm) without contacting calculus or lump, enlarged choledochal duct, distal obstruction of common bile duct, enlarged pancreas with diffuse hard texture with contacting solitary tumor, lymphadenectasis at mesentery root. According to patient's intraoperative performance and considering the possibility of autoimmune pancreatitis (AIP), we discussed with patient's family members and decided to perform pancreaticoduodenectomy instead of take gallbladder jejunum side to side anastomosis + jejunum jejunum side to side anastomosis internal drainage. 2 weeks after operation, the patient visited Peking Union Medical College Hospital (PUMCH) and results showed high-sensitivity C-reactive protein (hsCRP) 8.66mg/L, IgG8.96g/L, IgG1 8240mg/L, IgG2 1760mg/L, IgG3 172mg/L IgG4 208g/L. According to patient's self-reported illness and clinical symptoms, although laboratory test did not support the diagnosis result of AIP and family members refused pancreatic needle biopsy and required to take conservative treatment, it can still take the illness as AIP and performed laboratory test for examination. It is worth noting that the patient refused high-dosage prednisone treatment<sup>(3)</sup>.

One year and three month after discharge, the patient was suddenly felt turgor and discomfort of upper abdomen combined with fever, with maximum body temperature reach 40°C, in the meantime, the patient suffered shivering, nausea and vomiting (vomitus was gastric content). The blood routine examination showed leukocyte  $0.67 \times 10^9$ , neutrophilic granulocyte percentage 7.96%, others were within normal range.

**Tumor marker:** CA19-9>1000U/ml, other pancreatic tumor-associate antigens were within normal range The upper abdomen CT results showed some changes after cholangiojejunostomy such as pancreatic head soft tissue mass combined with pancreatic duct dilatation, gall-bladder wall thickening, pneumo-gallbladder, expansion and pneumatosis of internal and external bile duct, uneven liver mass density, and lymphadenectasis at hepatic hilar region. The disease situation was serious after admission, which was diagnosed as 1 chronic pancreatitis; 2 pancreatic cancer; 3 infectious shock; 4MODS (kidney, blood, liver, circulation system); 5 agranulocytosis; 6 biliary tract

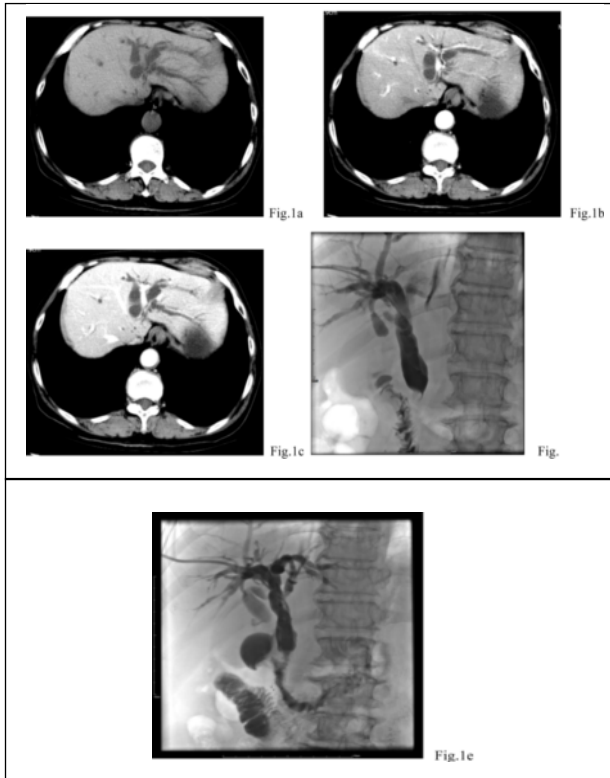
infection after cholecystojejunostomy. After transferred into ICU for treatment, the patient gradually got better and then leaf hospital. 2 months after discharge (August 20th, 2014), the patient was attached by intermittent fever and obstructive jaundice. The contrast-enhanced CT of upper abdomen showed pancreatic head soft tissue tumor combined with pancreatic duct dilatation and intra-and extra-hepatic cholangiectasis (Fig. 1a-c), therefore the patient was hospitalized again at August 21st, 2014.

After admission, the patient was subjected to PTCO (percutaneous transhepatic cholangial drainage) to relieve obstructive symptoms, followed by reconstruction of bile excretion pathways. After surgery (Fig. 1d-e), the patient was well recovered and then leaf hospital. At the 8th month after PTCO, the patient was readmitted to hospital for obstructive jaundice combined with infection. This time, by conducting BTED imaging, it can observe (showed) intra-hepatic bile duct dilation, stenosis and obstruction in common bile duct stent. Therefore the balloon dilatation was performed and external drainage tube was changed, followed by (following the) postoperative symptomatic treatment, then the patient got better (Fig. 2abc).

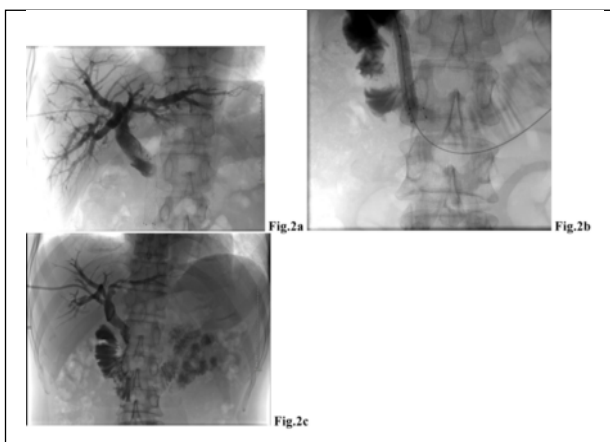
3 months later, the patient showed fever and jaundice symptoms again, and the cholangiography indicated stent blocking. Therefore the patient was subjected to stent balloon dilatation again and the drainage tube was changed again. After that the patient recovered and left the hospital. After 5 and half months, the patient visited hospital for reexamination. According to the contrast-enhanced CT of upper abdomen, it can observe pancreatic head soft tissue tumor and pancreatic duct dilatation; intra-and extrahepatic cholangiectasis, and multiple intrahepatic low density focus which might be metastasized. After changing drainage tube and performing symptomatic treatment, the patient was discharged from (left the) hospital. On December 23th, 2015, the patient was admitted to hospital for progressed disease, showing intermittent nausea and vomit. The CT results showed pancreatic cancer liver metastasis and pulmonary metastasis. Through belly flat film and digestive tract radiography, it showed incomplete obstruction of duodenum and biliary stent fracture.

Considering the progress of pancreatic head lesion and stent fracture obstruction, we implanted a new stent in the fractured position, and broke through the bile excretion pathway again. After postoperative symptomatic treatment, the patient

was supposed to get better. However as this patient was in advanced pancreatic cancer with (multiple organs) systemic metastasis and antineoplaston had not been performed, the patient suffered a continued deterioration of disease and died for multiple organ failure on March 27th, 2016.



As shown in Fig. 1 (a-e), the CT scan before intervention operation showed intra-hepatic bile duct dilation. According to interventional intraoperative angiography, it can observe stenosis and obstruction of lower common bile duct, therefore we implanted a biliary stent during operation and retained biliary tract external drainage tube.



As shown in Fig. 2, stent restenosis occurs with the progress of the patient's disease, and symptoms of obstructive jaundice repeatedly occur, which all are relieved by interventional balloon dilatation of stenosis segment.

## Discussion

Pancreatic cancer belongs to malignant tumor of digestive tract, which is in high grade of malignancy and difficult to diagnose and treat. 90% of pancreatic cancers are ductal adenocarcinoma stemmed from glandular tube epithelium. The morbidity and mortality of pancreatic cancer have been rising significantly in recent year. With five-year survival rate less than 1%, pancreatic cancer is one of malignant tumors with the worst prognosis. The diagnose rate of early pancreatic cancer is not high, while the operative mortality rate is high and cure rate is very low. Male patients have a higher morbidity of pancreatic cancer than female patients, with male/female rate as 1.5~2:1. This disease occurs more often on male patients than on premenopausal female patients, while postmenopausal female patients suffer a equal morbidity as male patients.

Autoimmune pancreatitis (AIP) is a special chronic pancreatitis mediated by autoimmunity, with symptoms such as pancreas diffuse enlargement and main pancreatic duct involvements shown in iconography. AIP is often cut for being misdiagnosed as tumor. It can be divided into two types according to its pathological features. The diagnostic criteria of AIP are various, which have not been unified. Domestic document has ever reported a AIP patient had weight loss by 51.2% before being diagnosed. This indicates that domestic patients have been suffering a long course of disease before being diagnosed. The early symptoms such as abdominal distension, back pain, poor appetite, and lacking in strength can hardly be detected. Moreover, the disease can even hardly be diagnosed with the involvement of pancreatic organ damage. This is partially due to domestic people's insufficient understanding on this disease<sup>(11, 12, 13)</sup>.

Both AIP and pancreatic cancer occur more frequently on elderly male patients, with insignificant gender difference and confused clinical manifestations between the two disease groups. The patient selected in this research decided to see a doctor for his obstructive jaundice symptoms. According to certain domestic research, the AIP group is featured by increases of serum immunoglobulin IgG and IgG4. The levels of seroglobulin, eosinophils, bilirubin, liver enzyme and biliary enzyme of AIP group are significantly higher than those of pancreatic cancer group ( $P <$

0.05), while the levels of tumor marker Ca19-9 and hemoglobin are significantly lower than those of pancreatic cancer group ( $P < 0.05$ ). Distinguishing AIP from pancreatic cancer based on 4 combined indexes such as Ca19-9, globulin, hemoglobin, eosinophils, it can achieve a high treatment value with sensitivity of 84% and specificity of 88%<sup>(14)</sup>. In this case, the levels of IgG and IgG4 were not high, but the tumor marker level increased, therefore the patient tended to be pancreatic cancer. As the degree of tumor malignant was lower, no characteristic symptoms of pancreatic cancer can be observed from the early laboratory test and imaging studies. In addition, the family members of the patient refused to make a definitive diagnosis by performing preoperative puncture biopsy pathology, no significant tumor can be detected during operation, therefore it cannot exclude the possibility of AIP.

After communicating with family members, it decided to take Roux -en-Y cholecystoenterostomy for internal drainage treatment instead of a radical surgical treatment. After surgery, the patient was admitted to Union Hospital, and the possibility of AIP was preliminarily excluded. After that, the patient showed no symptoms and refused other treatments. Due to the fact that the primary lesion was not cut, normal bile excretion pathway was changed, and normal bile excretion pathway was blocked with the progress of disease, the patient gradually showed infection symptoms and eventually showed obstructive jaundice with severe infection symptoms in the postoperative period. Therefore the patient was successively subjected to PTCD and BTED at Aug 21st, 2014, Jan 5th, 2015, and Apr 9th, 2015. After that the disease was progressed into Stent obstruction, therefore stent balloon dilatation and drainage tube changing were repeatedly performed to relieve the biliary obstruction symptoms.

In this case, the bile drainage pathway of the patient was changed due to the damage of normal physiological structure caused by surgery. With the pancreatic cancer growth, the common bile duct stenosis was occurred, normal bile drainage pathway was blocked by jaundice and infection, therefore the reconstruction of bile drainage pathway was performed. However due to the drainage blocking at gallbladder - jejunum anastomosis area, the reconstruction cannot realize the function of relieving jaundice, leading to intra-and extra-hepatic bile duct obstruction and dilation, and thus

the intestinal bacteria at anastomotic stoma retrograded into gall bladder due to blocked bile drainage, causing the infection of biliary tract<sup>(2,4,15,16)</sup>. PTCD and BTED was performed for the patient by implanting a stent at biliary tract obstruction area to relieve the obstruction symptoms<sup>(8)</sup>, so that the bile was guided into gastrointestinal tract via a normal drainage pathway to take part in digestive absorption process, and thus improving the patient's nutritional status. In addition, we retained the drainage tube outside of biliary tract to drain some blocked bile out, so as to accelerate the relieving of obstructive jaundice<sup>(1,9)</sup>.

After the jaundice symptoms were relieved in certain degree, the external drainage tube was closed, so that the bile can enter into intestinal tract via normal pathway to take part in digestion, bilirubin index can be controlled within normal range, liver function was significantly improved, aminotransferase was recovered to normal level, and the obstructive jaundice and infection symptoms were removed. Even if the lesion develops and obstruction of biliary tract happens again, it can still be relieved by performing stent balloon dilatation and implanting a stent again. PTCD and BTED are two major minimally invasive surgeries to relieve obstruction of biliary tract. In addition to these two method, a biliary stent can also be implanted via performing ERCP<sup>(4)</sup>.

However the patient in this research has already accepted surgical treatment, therefore his normal structure of gastrointestinal tract is damaged, the bile moving route is changed, which makes it more difficult to treatment. In addition, since the PTCD enjoys a high success rate, with less complication and more accurate therapeutic effect, performing PTCD and BTED can quickly relieve obstructive jaundice symptoms and control infection<sup>(7,10)</sup>. During the whole course of disease in this case, surgery was only conducted after preliminarily diagnosed as pancreatic cancer in very early stage. After that, the patient refused to take surgery or chemotherapy for pancreatic cancer, but only accepted conservation expectant treatments for the disease and related complications. Therefore, the lesion continued to develop, leading to multiple occurrences of obstruction of biliary tract and later jaundice symptoms. Since PTCD and BTED were performed to relieve obstruction of biliary tract for the first time, restenosis occurred for many times and obstructive jaundice was eventually caused.

Every time, we treated it by changing guide wire via biliary external drainage tube, expanding stenosis segment by balloon catheter dilation, regularly changing, washing and replacing drainage tube, and even reimplanting a new stent at original stent site to relieve obstruction, so as to get through bile duct and maintain a smooth biliary drainage. In this case, it is acceptable for the patient only taking conservative treatments as the lesion was in a low-grade malignant lesion which developed relatively slowly. However due to the gradual development of the lesion as we as to the changed bile excretion pathway by the surgery in early stage, the patient showed multiple occurrence of infection with obstructive jaundice, which caused deterioration of liver function and endangered patient's life<sup>(17)</sup>. However, by performing PTCD and BTED, the jaundice index was quickly reduced. In addition, the bile excretion pathway was reconstructed, which made the patient away from the endangered infection and obstructive jaundice symptoms caused by lesion development and surgery<sup>(5, 6, 16)</sup>. During the period of survival, patient's Karnofsky Performance Status varied within 80-90, showing significantly improved quality of life.

As a result, in the treatment processes of some low-grade malignant biliary or liver neoplasm, PTCD and/or BTED can be performed to get through obstruction segment of biliary tract, reconstruct bile drainage pathway, drainage obstructed bile, relieve jaundice symptoms, quickly reduce bilirubin level, effectively relieve jaundice, improve liver function, so as to realize an excellent therapeutic effect for abnormal liver function and prevent liver function deterioration or even failure caused by obstructive jaundice. The surgical treatments proposed in this paper can improve patient's whole body function, which provides a sound condition for further treatment, so as to prolong life length and improve life quality.

## References

- 1) Kubo K1, Kawakami H2,3, Kuwatani M4, Nishida M5, Kawakubo K6, Kawahata S1, Taya Y1, Kubota Y1,7, Amano T8, Shirato H9, Sakamoto N6. Erratum to: Liver elasticity measurement before and after biliary drainage in patients with obstructive jaundice: a prospective cohort study. *BMC Gastroenterol.* 2016 Sep 20; 16(1): 116.
- 2) Baterdene N, Hwang S, Lee JW, Jung MJ, Shin H, Seo HK, Kim MH, Lee SK. Surgical treatment of mucin-producing cholangiocarcinoma arising from intraductal papillary neoplasm of the intrahepatic bile duct: a report of 2 cases. *Korean J Hepatobiliary Pancreat Surg.* 2016 Aug; 20(3): 137-43. doi: 10.14701/kjhbps.2016.20.3.137. Epub 2016 Aug 29.
- 3) Yamabe A, Irisawa A, Notohara K, Shibukawa G, Fujisawa M, Sato A, Yoshida Y, Arakawa N, Ikeda T, Igarashi R, Maki T, Yamamoto S. A case of autoimmune pancreatitis effectively treated with an immunosuppressant (azathioprine). *Clin J Gastroenterol.* 2016 Oct; 9(5): 324-8. doi: 10.1007/s12328-016-0673-4. Epub 2016 Jul 23.
- 4) Choi JH, Kim HW, Lee JC, Paik KH, Seong NJ, Yoon CJ, Hwang JH, Kim J. Percutaneous transhepatic versus EUS-guided allbladder drainage for malignant cystic duct obstruction. *Gastrointest Endosc.* 2016, Aug 23. pii: S0016-5107(16)30480-1. doi: 10.1016/j.gie.2016.07.067. [Epub ahead of print]
- 5) Bonnel DH, Fingerhut AL. Percutaneous transhepatic balloon dilatation of benign bilioenteric strictures: long-term results in 110 patients. *Am J Surg.* 2012 Jun; 203(6): 675-83. doi: 10.1016/j.amjsurg.2012.02.001.
- 6) Hwang S1, Song GW, Ha TY, Lee YJ, Kim KH, Ahn CS, Sung KB, Ko GY, Kim MH, Lee SK, Moon DB, Jung DH, Park GC, Lee SG. Reappraisal of percutaneous transhepatic biliary drainage tract recurrence after resection of perihilar bile duct cancer.
- 7) Hwang S1, Song GW, Ha TY, Lee YJ, Kim KH, Ahn CS, Sung KB, Ko GY, Kim MH, Lee SK, Moon DB, Jung DH, Park GC, Lee SG. Percutaneous placement of self-expandable metallic stents in patients with obstructive jaundice secondary to metastatic gastric cancer after gastrectomy. *Am J Surg.* 2012 Jun; 203(6): 675-83. doi: 10.1016/j.amjsurg.2012.02.001.
- 8) Percutaneous transhepatic treatment using retrievable covered stents in patients with benign biliary strictures: mid-term outcomes in 68 patients. *Hong HP, Seo TS, Cha IH, Yu JR, Mok YJ, Oh JH, Kwon SH, Kim SS, Kim SK. Korean J Radiol.* 2013 Sep-Oct; 14(5): 789-96. doi: 10.3348/kjr.2013.14.5.789. Epub 2013 Aug 30.
- 9) J Garcarek, J Kurcz, Guzin ski M, D Janczak, M Sasiadek. Ten years single center experience in percutaneous transhepatic decompression of biliary tree in patients with malignant obstructive jaundice. *Advances in clinical and medicine.* 2012 Sep-Oct; 21(5): 621-32.
- 10) C Xu, XE Huang, SX Wang, PH Lv. Comparison of infection between internal-external and external percutaneous transhepatic biliary drainage in treating patients with malignant obstructive jaundice. *Asian Pac J Cancer Prev. Sci.* 2015; 16(6): 2543-6.
- 11) Fu Yi, Li Can, Zhang Xi, Peng Weijun. CT differential diagnosis for focal autoimmune pancreatitis and pancreatic cancer. Department of Radiodiagnosis of Fudan University Shanghai Cancer Center, Tumor imaging, 2014, Vol. 23 No. 4, 286-289
- 12) Zhao Jun Kang, Shi Lei, Sun Xuejun, General Surgery Department of the First Affiliated Hospital of Xi'an Jiaotong University, Xi'an, Shanxi Province. A case study of autoimmune pancreatitis combined with obstructive jaundice. *Journal of Hepatopancreatobiliary Surgery.* Vol. 25, No. 5, 432-433
- 13) Yan Tianlian, Li Youming. Clinical features of autoimmune pancreatitis and differential diagnosis between autoimmune pancreatitis and pancreatic cancer. doctor-

- al dissertation of Zhejiang University. May 28, 2014.
- 14) Liu Yuting, Jin Zhendong, Li Zhaoshen, Xu Can, Department of Gastroenterology, Changhai Hospital Affiliated to Second Military Medical University. Research progress of endoscopic ultrasound-guided bile duct drainage. Chinese Journal of Digestive Endoscopy, 2015 No. 4 270-272.
- 15) Fan Hengwei, Liu Huichun, Cui Peiyuan. Comparison of therapeutic effect between percutaneous transhepatic cholangial drainage and palliative biliary drainage in treating obstructive jaundice-induced by pancreatic head carcinoma. Chinese Journal of Hepatobiliary Surgery, 2014, Vol.20, No.02, 92-96.
- 16) Niu Hongtao, Cui Renyou. Exploration of risk factors for biliary tract infection for patients with malignant obstructive jaundice after accepting percutaneous transhepatic cholangial drainage. Chinese Journal of Radiology, 2011, Vol.45, No.10, 964-968.

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