

Retrospective Analysis of 128 Patients of Acupuncture Consultation After Pancreatic Surgery

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Abstract: This study was conducted to analyze and summaries the current situation of acupuncture post-operative consultation of pancreatic cancer patients in the Qilu hospital of Shandong University, further provide a reference for acupuncture treatment of post-operative complications after pancreatic surgery, especially the effect of acupuncture in treating gastrointestinal dysfunction after pancreatic surgery. The consultation reasons, diagnosis, treatments, patient compliance, and the effect of acupuncture treatment of post-operative was studied and analyzed in 128 cases from October 9, 2020 to October 9, 2021. A total of 128 patients was selected for this study, and 116 of the patients were completely treated. This study showed that the effective rate of acupuncture; For early post-operative inflammatory bowel obstruction was 94.85 %; For post-operative gastric emptying dysfunction was 81.25%; For early post-operative inflammatory bowel obstruction with gastric emptying disorder was 66.67 %; and Clinical total effective rate was 91.38 %. This study concluded that acupuncture may promote pancreatic gastrointestinal function rehabilitation, and provide a new method to enhance the patient's recovery after surgery.

Keywords: General hospital; Acupuncture consultation; Gastrointestinal dysfunction after pancreatic surgery

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1. Introduction

Pancreatic surgery is one of the most challenging and complex areas of general surgery, with a high incidence of post-operative complications, and prolonged full recovery duration due to its difficult anatomy, and the complexity of reconstruction in the post-operative period ^[1]. Electro-acupuncture is a treatment method based on the acquisition of Qi, where the filiform needle is connected to an electro-acupuncture device, thereby the pulsed current output from the electro-acupuncture device acts on the body's meridian acupoints through the filiform needle, achieving the purpose of disease prevention and treatment. It is widely used clinically, and the procedure is simple to perform. The etiology, type of disease, and outcome of post-operative pancreatic consultation patients are summarized in this study to gain insight into the role of electro-acupuncture in post-operative pancreatic surgery, to achieve multidisciplinary cooperation, and to utilize the advantages of acupuncture therapy in general hospitals. A retrospective analysis of the post-pancreatic acupuncture consultation patients at the Qilu Hospital of Shandong University from 9 October 2020 to 9 October 2021 is analyzed and presented in this study.

2. Subjects and methods

2.1. General information

Department of Acupuncture and Tuina from the Qilu Hospital, Shandong University is a part of the research team that is involved in the post-operative pancreatic consultation from October 9, 2020 to October 9, 2021.

2.2. Inclusion criteria

The inclusion criteria for this study are described as below:

- (1) Consultations of the Department of Acupuncture and Tuina were requested from October 9, 2020 to October 9, 2021.
- (2) The surgery that was conducted in patients should involve the pancreas
- (3) Post-operative consultation was requested
- (4) Only acupuncture treatment was performed in the patients

2.3. Exclusion criteria

The cases were excluded if the consultation request was canceled by the medical advisors.

2.4. Methods

2.4.1. Method of consultation

Consultations in the group were performed by the consulting physician at the bedside of the patient on the ward every morning, subsequently the patient's conditions were assessed and recorded daily until the patient was discharged.

2.4.2. Statistical tools

The Canadian Medical Star Digital Health Software (version number 2017.0307) was generally applied to export all consultation data of acupuncture at the Qilu Hospital of Shandong University and the group's consultation data and counted, and by searching the group's patients' hospitalization numbers in the United Hospital Digital Case Search System (developed by Shanghai Lianzhong, Ltd., version number 2019.3.9.2702). Further, the post-pancreatic surgery patients were screened and their gender, age, date of consultation, application for consultation department, diagnosis of primary disease, operation mode, and reason for consultation were collated and summarized using EXCEL software, with privacy involved encrypted.

2.4.3. Statistical methods

SPSS 24.0 software was applied for data analysis, and the count data were analyzed by descriptive statistics, and expressed as mean \pm standard deviation.

3. Results

3.1. Study subjects

A total of 128 cases of post-operative pancreatic-related consultations were included in this study, where 62 patients (51.56%) were male and 66 (49.44%) were female. The mean age of the patients was 17-81 years (56.91 ± 14.33 years), and four departments were involved in this study, including Pancreatic Surgery in 101 cases (78.91%), Hepatobiliary Surgery in 25 cases (19.53%), Emergency Surgery in 1 case (0.78%), and 1 case of Colorectal Surgery (0.78%).

3.2. Reasons for applying for consultation after pancreatic surgery

Of the 128 cases that were involved in this study, 107 cases (83.59%) had abdominal distention and

defecation problems, 9 cases (7.03%) had post-operative nausea and vomiting, 11 cases (8.59%) had gastroparesis, and the post-operative of gastrointestinal dysfunction was the main reason for the acupuncture consultation.

3.3. The primary disease of consultations

That post-operative pancreatic consultation cases had a total of 51 cases with primary diagnosis of pancreatic cancer, as shown in **Table 1**.

Table 1. The primary disease of the cases that were involved in the post-operative pancreatic consultation

Primary disease	Cases (n)	Percentage (%)
Pancreatic cancer	51	39.84
Neuroendocrine tumor of the pancreas	9	7.03
Intraductal papillary mucinous neoplasms of the pancreas	9	7.03
Duodenal cancer	9	7.03
Bile duct carcinoma	8	6.25
Solid pseudopapillary tumor of the pancreas	7	5.47
Pancreatic serous cystadenoma	6	4.69
Pancreatic duodenal carcinoma	6	4.69
Mucinous cystic tumor of the pancreas	4	3.13
Neuroendocrine tumor of the duodenum	2	1.56
Chronic pancreatitis	2	1.56
Carcinoma of the common bile duct	2	1.56
Autoimmune pancreatitis	1	0.78
Pseudocyst of the pancreas	1	0.78
Pancreatic mixed neuroendocrine-non- neuroendocrine neoplasms	1	0.78
Pancreatic cancer with liver metastases	1	0.78
Pancreatic cancer Ascending colon cancer	1	0.78
Pancreatic tail infarction with acute pancreatitis; splenic infarction	1	0.78
Pancreatic duodenal neuroendocrine tumor	1	0.78
Duodenal cancer; Neuroendocrine tumor	1	0.78
Chronic pancreatitis pancreatic duct stones	1	0.78
High-grade intraepithelial neoplasia of colon	1	0.78
Abdominal trauma, acute pancreatitis, peritoneal effusion	1	0.78
Gallbladder stones with cholecystitis common bile duct stones	1	0.78
Bile duct stone with cholangitis	1	0.78

3.4. Surgical options of consultation cases

Table 2 shows the surgical options of the consultation cases.

Table 2. The surgical options of consultation cases

Name of surgery	Cases (n)	Percentage (%)
Pancreaticoduodenectomy	48	37.50
Laparoscopic pancreaticoduodenectomy	23	17.97
Laparoscopic distal pancreatectomy	15	11.72
Open distal pancreatectomy	10	7.81
Laparoscopic central pancreatectomy	6	4.69
Laparoscopic partial pancreatectomy	4	3.13
Partial pancreatectomy	3	2.34
Cholecystectomy + exploration and biopsy of pancreas + cholangiojejunostomy + gastrointestinal anastomosis	2	1.56
Laparoscopic duodenum-preserving pancreatic head resection + cholecystectomy	1	0.78
Laparoscopic cholangiojejunostomy + pancreaticojejunostomy + enteroenterostomy	1	0.78
Laparoscopic partial pancreatectomy + splenectomysplenectomy	1	0.78
Laparoscopic subtotal pancreatectomy + splenectomy	1	0.78
Laparoscopic partial pancreatectomy + Roux-en-Y cholangiojejunostomy	1	0.78
Laparoscopic exploration and biopsy of pancreas + conventional chemotherapeutic drugs intraperitoneal chemotherapy	1	0.78
Pancreaticoduodenectomy + totally right colectomy	2	0.78
Total pancreaticoduodenectomy	1	0.78
Total pancreatectomy	1	0.78
Pancreaticoduodenectomy + right nephrectomy	1	0.78
Open distal pancreatectomy + partial gastrectomy + partial jejunectomy	1	0.78
Exploration and biopsy of pancreas + cholangioenterostomy + gastroenterostomy	1	0.78
Laparoscopic exploration and biopsy of pancreas and liver	1	0.78
Endoscopic retrograde cholangiopancreatography	1	0.78
Endoscopic retrograde cholangiopancreatography + laparoscopic cholecystectomy	1	0.78
Suture repair of liver rupture + repair of pancreas rupture + decompressive laparotomy + negative pressure aspiration	1	0.78

3.5. Diagnosis of consultations

Table 3 shows the diagnosis of consultations.

Table 3. The diagnosis of consultations

Diagnosis	Case (n)	Percentage (%)
Post-operative ileus	107	83.59
Post-operative gastric emptying disorder	17	13.28
Post-operative ileus and post-operative gastric emptying disorder	3	2.34
Umbar Intervertebral Disc	1	0.78

3.6. Consultation adherence of all consultations

Of the 128 cases, 5 patients (3.91%) refused to acupuncture treatment for the first time after the communication, 1 patient felt cured at the time of consultation, and 4 were afraid of the needles (including one patient with post-operative low back pain), and a total of 123 patients were involved in the consultation treatment. The overall implementation rate of the consultation was 96.09%. In addition, 7 patients refused and discontinued the treatment during the consultation period, including; 1 patient who was unwell during the treatment; 3 patients who were afraid of the needles; and 3 patients who refused to continue treatment because they felt it was ineffective or had worsened their condition, resulting in 92.19% of full compliance, with 116 patients complete the treatments.

3.7. Consultation and management

Below is the description of the consultation procedure:

- (1) The main acupoints: Zusanli (ST36), Shangjuxu (ST37) of both sides
- (2) Auxiliary acupoints: Gongsun (SP4), and Taichong(LR3) of both sides, Neiguan (PC6), and Zhigou (SJ6) of single side.
- (3) Operation method: Connect the electric needle instrument of plus or minus pole respectively on the needle handle of ST36 and ST37 on the same side for 20 minutes with 2 Hz, once a day.

3.8. Post-discharge outcome follow-up

Excluding the patients who refused to receive acupuncture treatment for the first time and those who requested to discontinue the treatment, a total of 116 patients were completely undergo the treatment procedure; Around 97 patients had early post-operative ileus; 16 patients had post-operative gastric emptying disorder; and 3 had both post-operative ileus and post-operative gastric emptying disorder. The total effective rate was 91.39%, and all the patients did not experience any adverse reactions caused by needling during the treatment. The results are presented in **Table 4**.

Table 4. The curative effect of all patients

	Post-operative ileus (n/%)	Post-operative gastric emptying disorder (n/%)	Both (n/%)	Total (n/%)
Cured	54 (55.67)	2 (12.5)	0 (0)	56 (48.28)
Improved	38 (39.18)	11 (68.75)	2 (66.67)	51 (43.97)
Ineffective	5 (5.15)	3 (18.75)	1 (33.33)	9 (8.62)
Total	97 (83.62)	16 (13.79)	3 (2.59)	116 (100)

3.9. Treatment days

Patients with early post-operative inflammatory bowel obstruction was treated for 1-28 days with a mean of (6.18±2.96) days, patients with post-operative gastric emptying disorder were treated for 4-24 days with mean of (8.60±4.10) days, and patients with both the condition were treated for 6-15 days with mean of (10.00±3.74) days. Total treatment days 1-28 days, mean (6.94±4.32).

4. Discussion

From October 9, 2020 to October 9, 2021, around 290 pancreatic surgeries were performed in in the responsible departments, accounting for 6.16% of total pancreatic surgeries, and around 128 (44.14%) of the cases were requesting for consultations, of which 127 (43.79%) were requesting for consultations due to the symptoms or diagnosis of gastrointestinal disorders, in line with previous studies, the incidence of

post-operative pancreatic surgery ^[2], which ranged from approximately 22.7% to 56% in this study (**Table 3**). The cases can be subdivided into post-operative bowel obstruction and delayed gastric emptying based on the patient's symptoms and examination ^[3]. No other post-operative pancreatic complications have been requested for consultation.

Post-operative ileus (POI) ^[4] is a specific type of post-operative intestinal obstruction that have characteristics of both mechanical and dynamic in nature. The main symptoms of this post-operative complications are abdominal distention, cessation of defecation, and loss of bowel sounds ^[5]. Post-operative delayed gastric emptying (DGE) is a gastrointestinal dysfunction syndrome with impaired gastric emptying as the main cause. Both the post-operative complications are the most common post-operative complications of pancreatic surgery, which are detrimental to patients' post-operative recovery, aggravate their pain, and prolong their hospital stay. Generally, conservative treatment is the mainstay of treatment, including dietary suppression, gastrointestinal decompression, correction of post-operative electrolyte disorders, and the use of gastric motility drugs, however, there is no specific treatment for these post-operative complications ^[6]. According to Chinese medicine, Qi deficiency and blood weakness, Qi stagnation, and blood stasis may develop in patients after the post-operative, which may result in the damage of spleen function of transformation of water and grain, the loss of gastric harmony and lowering, inaccessibility of internal Qi, and closure of Qi by evil, leading to the development of these two complications.

The interstitial cells of Cajal (ICCs) are gastrointestinal pacemaker cells that cause the gastrointestinal motility ^[7], therefore their reduction or disappearance can lead to impaired gastrointestinal motility. Acupuncture of the Zusanli and Shangju xu has been demonstrated to promote the restoration of ICC levels in the gastrointestinal tract, thereby promoting recovery of gastrointestinal motor function ^[8-12]. The combination of acupuncture at; Gong Sun Nei Guan points is to eliminate fullness and distension; Zhi Gou points is to clear the heat and internal organs; and Tai Chong points are to detoxify the liver and strengthen the spleen and regulate the emotions, which can effectively improve the patient's gastrointestinal motility. During the consultation, around 55.67% of patients with early post-operative inflammatory bowel obstruction had normal bowel sounds, regular bowel movements, the disappearance of abdominal distension, nausea, and vomiting, and normal tolerance of diet after the treatment, and around 39.18% of patients had passed gas and stools, and symptoms such as abdominal distension, nausea, and vomiting had improved significantly. Additionally, around 12.5% of patients with the post-operative gastric emptying disorder had their gastric tubes removed after the treatment, and were fed by mouth, and upper gastrointestinal imaging showed gastric emptying and peristalsis, meanwhile, around 68.75% of patients with abdominal distension, nausea, and other symptoms were significantly reduced, and the upper gastrointestinal tract imaging showed gastric emptying and slow peristalsis. It can be seen that the application of acupuncture for the treatment of post-pancreatic gastrointestinal dysfunction is safe, less painful, and effective, and is gradually being accepted by surgeons and patients (**Table 4**).

However, during the consultation process, there is a blind spot in the patient's perception of Chinese medicine, or the patient refuses treatment due to fear of acupuncture as a result of daily examination and treatment, and lastly, the lack of proper communication between the consulting physician and the patient's supervising physician may affect the effectiveness of the consultation to a certain extent. Some patients are discharged after their gastrointestinal symptoms have improved, without completing the consultation, therefore the true effectiveness of the consultation treatment cannot be judged. Therefore, as the etiology of the disease becomes more complicated during the consultation due to changes in the condition and surgical and pre-operative interventions, the consulting physician should focus more on changes in the patient's condition, anticipate disease regression, communicate well in advance with the patient, and inform the patient of the etiology of the disease and the course if acupuncture treatment required. In a few cases,

after the removal of the nasogastric tube three days post-surgery, gastroparesis or delayed gastric emptying occurred, and the patient felt bloated, nauseous, and vomiting, and requested the acupuncturist consultation, leading to delayed in the treatment.

To improve the efficiency and clinical efficacy of post-operative pancreatic consultation, the consulting physician should also fully understand the patient's primary disease and the surgical procedure to improve the communication, in order to make accurate diagnostic and treatment plan (**Table 1** and **Table 2**).

In addition, there was no consultation requested for other complications in this group, therefore the efficacy of acupuncture on other complications could not be observed. Post-operative complications of pancreatic surgery, including delayed gastric emptying, bleeding, pancreatic fistula, biliary fistula, gastrointestinal fistula, celiac leakage, abdominal abscess, acute and chronic pancreatitis, pancreatic endocrine insufficiency, local ischemia, and surgical site infection were reported in the previous studies [13-16], an addition to the complications of delayed gastric emptying and other post-operative gastrointestinal dysfunction. Therefore, in the future, the acupuncture department of general hospitals should strengthen the cooperation and communication between multiple disciplines, and continuously study the additional indications for acupuncture.

The group also consulted cases that did not appear in the pre-operative consultation, therefore, the efficacy of pre-operative acupuncture in preventing post-operative gastrointestinal dysfunction and other complications after pancreatic surgery is could not be determined, thereby in the future, the patient's physician should timely communicate, and participate in multidisciplinary collaboration to achieve the first and last pre-operative, or to start acupuncture therapy first day after the surgery, to observe the role of statistical acupuncture in the entire perioperative period, to improve the efficacy of acupuncture, and promote the post-operative rehabilitation of the patients. Finally, to expand the influence and overall development of Traditional Chinese Medicine (TCM) in general hospitals.

Disclosure statement

The authors declare no conflict of interest.

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