



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 10, Issue, 01, pp.9382-9385, January, 2019

RESEARCH ARTICLE

APPLICATION OF PANCREATIC AND GASTRIC BINDING RECONSTRUCTION IN PATIENTS WITH PANCREATICODUODENECTOMY

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ARTICLE INFO

Article History:

Received 29th October, 2018
Received in revised form
15th November, 2018
Accepted 10th December, 2018
Published online 30th January, 2019

Key words:

Binding, Pancreaticogastrostomy,
Pancreaticoduodenectomy,
HRQOL, tumor.

ABSTRACT

Objective: To investigate the clinical application value of pancreatic stomach bundled reconstruction (binding pancreaticogastrostomy, combined) in pancreatic duodenal resection (pancreaticoduodenectomy, PD).

Methods: The clinical data of 16 patients with pancreaticoduodenectomy combined with pancreatic stump and gastric binding reconstruction in our department were analyzed. The incidence of postoperative complications and its causes were analyzed. Chinese sf-36 health survey scale was used to investigate health-related quality of life (HRQOL) of patients.

Results: 1 case of postoperative pancreatic stump hemorrhage was cured after conservative treatment. Postoperative complications such as pancreatic leakage, biliary fistula and delayed gastric emptying were not found. The content of peritoneal drainage fluid and amylase in the peritoneal cavity of the patients decreased gradually, and the gastrointestinal function showed better recovery. All patients were cured and discharged. The quality of life of the patients in this group was better after operation.

Conclusion: in pancreaticoduodenectomy, pancreaticogastric binding reconstruction has its own unique advantages. Reasonable application of pancreaticogastrostomy may reduce the incidence of postoperative pancreatic fistula in patients, and has better long-term quality of life.

Citation: Li donghai, Song fei Zhao xueyu and Liu ming. 2019. "Application of pancreatic and gastric binding reconstruction in patients with pancreaticoduodenectomy", *Asian Journal of Science and Technology*, 10, (01), 9382-9385.

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INTRODUCTION

Whipple reported for the first time since 1935 of pancreaticoduodenal resection (pancreaticoduodenectomy, PD). Since then the occurrence of postoperative complications has been closely watched. Pancreatic digestive tract reconstruction is one of the important influencing factors for postoperative complications, among which pancreatic leakage has always been the most common serious postoperative complication (Peng, 2011). Studies have found that the incidence of pancreatic fistula was between 8% and 25%, and the mortality caused by it was as high as 20% ~ 50% (Butturini, 2008). However, with the progress of research and the continuous improvement of surgical techniques, postoperative mortality has decreased significantly (Baker, 2015). In 2008, Peng Shuyou established binding pancreaticogastrostomy (BPG) and achieved good clinical results (Peng, 2009 and Peng, 2011).

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In recent years, our department has adopted bound pancreatogastrostomy for the reconstruction of digestive tract in some PD patients. And the postoperative patients have achieved good clinical efficacy and long-term prognosis. In this study, the efficacy of this method was preliminarily analyzed.

MATERIALS AND METHODS

General information: In this study, 16 patients were selected, including 7 males and 9 females. The average age was 61.5 years (51 ~ 72 years). Among them, there were 3 cases of periampullary carcinoma, 3 cases of common bile duct carcinoma, 2 cases of duodenal stromal tumor, 6 cases of pancreatic head carcinoma and 2 cases of pancreatic head cystadenoma. At the same time, 16 healthy people of the same age in the physical examination center of our hospital were randomly selected for comparative investigation on the quality of life. Patients were preoperatively treated with CA-199 detection, enhanced CT, MRI, and/or PET-CT, and the lesion scope and surgical feasibility were fully evaluated.

RESEARCH METHODS

Surgical methods

Study object: pancreaticoduodenectomy under general anesthesia. Methods for pancreatic and gastric anastomosis: first, free pancreatic stump 3-4cm, carefully hemostasis of the stump. A supporting tube was then placed in the main pancreatic duct and fixed, and discontinuous suture was performed on the stump section of the pancreatic duct using line 1 or 4-0 prolene (to prevent postoperative pancreatic stump bleeding). Then, a 2-3cm incision was made in the posterior wall of the stomach body close to the side of the pancreas. The pancreas was put into the stomach about 3cm down, and the stomach cavity was in and out. The purse-string was ligated, and 5-0 prolene thread was used to reinforce and suture the pancreatic capsule and the gastric muscle layer.

Quality of life survey: HRQOL survey (Li, 2002): SF-36 health survey scale is the most widely used life quality assessment tool in the world. The SF-36 scale evaluates eight aspects of HRQoL, namely, physiological function, physiological function, physical pain, overall health, vitality, social function, emotional function and mental health.

Statistical methods: SPSS19.0 statistical software was used to analyze the data. The measurement data were expressed as mean standard deviation, and the counting data were expressed as natural number and percentage. Two independent samples were used to test the normal distribution. $P < 0.05$ was considered statistically significant. Baseline data of patients and healthy population were compared, and scores were compared.

RESULTS AND EVALUATION CRITERIA

Evaluation criteria of results: (1) Pancreatic fistula criteria: postoperative drainage volume of patients was continuously greater than 50 ml, and the amylase content was 2 times higher than the serum concentration. (2) Delayed gastric emptying criteria: gastric retention time was more than 5 d after surgery.

The results: The mean operative time was (260.5 23.1) min, and the operative blood loss was (373.2 115.3) ml. And the postoperative hospital stay was 8 ~ 14 days, with an average of (9.6 1.3) d. Postoperative pancreatic stump bleeding occurred in 1 case, with the patient recovering after conservative treatment. There were no complications such as pancreatic leakage, biliary fistula and delayed gastric emptying. No perioperative death was found. The content of intraperitoneal drainage fluid and intraperitoneal amylase gradually decreased after surgery, and the gastrointestinal function recovered well. The patient was cured and discharged. This study showed that postoperative physiological function score of patients was lower than that of healthy people. At 12 months after surgery, the scores of emotional function were lower than those of healthy people, and the difference was statistically significant. There was no significant difference between the scores of other dimensions and those of healthy people. With the increase of the number of days of hospitalization in postoperative patients at 1d, 3d, 5d and 7d, the abdominal drainage volume gradually increased Reduced.

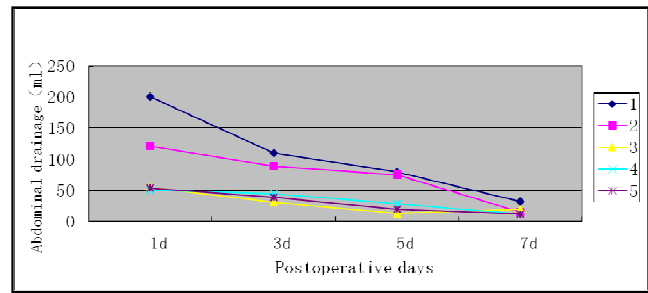


Figure 1A. The abdominal cavity flow of five postoperative patients

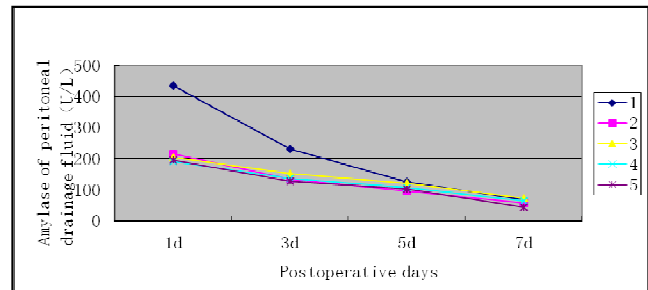


Figure 1B. The abdominal amylase trend chart of five postoperative patients

With the increase of days of hospitalization, the content of amylase in the abdominal cavity decreased and leveled off at 1d, 3d, 5d and 7d.

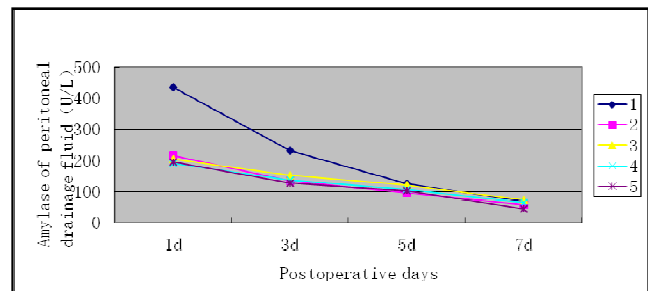


Figure 1C. The gastrointestinal decompression of five postoperative patients

Postoperative gastrointestinal decompression was gradually reduced and gastrointestinal function recovered well with the increase of hospitalization days at 1d, 3d, 5d and 7d.

DISCUSSION

Pancreaticoduodenectomy is still the main and effective treatment for malignant tumors of the head of the pancreas, the common bile duct, the ampulla and the duodenum. This operation involves combined resection of the internal organs, resulting in a high incidence of postoperative complications and mortality. Pancreatic digestive tract reconstruction is one of the key steps in PD. And improper treatment may increase the incidence of postoperative pancreatic fistula. Studies have found that pancreatic fistula is one of the serious postoperative complications of PD, and can further cause a series of other complications, such as bleeding, infection, intraperitoneal abscess, etc., which is the main cause of postoperative death of

Table 1. Comparison of SF-36 scale score in 8 dimensions between patients with pancreaticoduodenectomy using pancreas-gastric banding digestive tract reconstruction (BPG) and healthy control group (score, $\bar{X} \pm s$)

The dimension	Healthy control group (16case)	BPG group (16case)					
		6 months			12 months		
		after surgery	T value	P value	after surgery	T value	P value
Overall health	55.9±14.5	55.3±13.7	0.111	0.913	51.6±5.5	1.000	0.327
Physiological function	80.1±9.6	71.3±14.0	1.860	0.075	78.3±10.4	0.451	0.656
Physical sensations	79.8±8.6	48.8±10.6	8.171	0.000	50.1±9.5	8.350	0.000
Body pain	82.4±12.2	79.7±12.2	0.562	0.580	82.2±10.7	0.034	0.973
Living force	52.6±8.9	59.4±13.8	-1.489	0.149	57.6±12.5	-1.175	0.251
Life functions	80.2±9.3	74.6±12.9	1.261	0.219	76.2±13.3	0.890	0.382
Emotional function	82.8±12.4	63.6±14.3	3.662	0.001	50.2±12.0	6.806	0.000
Mental health	60.2±12.6	60.8±12.1	-0.120	0.905	57.6±11.1	0.573	0.572

Note: SF-36 scale is a brief table of health survey

Therefore, the prevention and treatment of pancreatic leakage has always been a focus of research by relevant professional doctors (Li, 2012). Some researchers (Peng, 2009; Walters, 2009 and Yu, 2015) hope to reduce the incidence of postoperative pancreatic fistula after PD by improving the surgical method, but there are still some disputes about the reasonable choice of surgical method. After pancreaticoduodenectomy, the occurrence of pancreatic leakage may be related to the following factors: leakage of the anastomotic needle eye; high anastomotic tension, poor anastomotic blood supply, abdominal infection, etc. (Shu You Peng, 2011). Therefore, the occurrence of pancreatic fistula is closely related to the reconstruction of pancreatic digestive tract. Studies have found (Yu, 2012), that the decrease of the incidence of pancreatic leakage after PD surgery may be related to the improvement of surgical methods. Pancreatic digestive tract reconstruction using BPG has achieved good clinical effect. This operation has the following advantages (Yu, 2013 and Hong, 2015). No need for direct suture of tying anastomosis, so pinhole leads to pancreatic leakage will not occur. (Butturini, 2008). Operation is relatively simple, pancreatic stomach anastomosis does not destroy the continuity of the digestive tract (Baker, 2015).

Anatomical location is adjacent and anastomotic tension is small and good blood flow. And the stomach cavity is large, compared with the traditional pancreaticojejunostomy this advantage is obvious (Peng, 2009). Bile, pancreas, is conducive to reducing the tension of the choledochojejunostomy. Even if anastomotic leakage occurs, it will not aggravate the disease due to the interaction between the two (Peng, 2011). Anastomosis is located in the stomach on the liquid level, conducive to healing (Li, 2002). Postoperative pancreatic stump necrosis, bleeding and other complications can be observed and treated by gastroscopy (Zhang, 2013). With the continuous progress of medical research, the diagnosis and treatment of diseases also pay attention to patients' subjective feelings. Therefore, the value of HRQOL in tumor diagnosis and treatment is increasingly reflected in evaluating the effect of therapeutic intervention through health status assessment. Then the rationality of clinical treatment measures can be evaluated.

In this study, we analyzed the application and prognosis of pancreatic gastric banding reconstruction in pancreaticoduodenectomy. No perioperative death was found in this group. Postoperative pancreatic stump bleeding occurred in 1 case, and the patient recovered after conservative treatment. There were no complications such as pancreatic leakage and biliary fistula. The postoperative recovery of the patients was good, and the intraperitoneal drainage fluid and amylase were gradually decreased. In this study, postoperative pancreatic stump bleeding in patients may be related to vascular rupture caused by pancreatic juice corrosion of pancreatic stump. Careful surgical operation and reasonable surgical selection can reduce the occurrence of this complication. The patient was in remission after conservative treatment. If conservative treatment fails, endoscopic exploration and hemostasis can be used. This is also one of the advantages of BPG. In this study, SF-36 health survey scale was used to investigate the HRQOL of 16 patients who received BPG after PD and 16 healthy people in this group. This study showed that postoperative physiological function score of patients was lower than that of healthy people. 12 months after surgery, the scores of emotional function were lower than those of healthy people, and the difference was statistically significant. There was no significant difference between the scores of other dimensions and those of healthy people. The results of this study are consistent with relevant domestic studies (Yu, 2015). PD surgery causes great trauma to patients. Therefore, it may have a great impact on the recovery of patients' physiological functions, and may have a lasting impact on patients' emotions and psycho. Timely and effective psychological intervention may solve the problem and improve the quality of postoperative life. The overall results showed that BPG was a safe and effective operation, which had little effect on the postoperative quality of life. Therefore, it is a safe and reliable method to reconstruct the digestive tract by pancreaticogastric anastomosis in pancreaticoduodenectomy. Skilled and correct application of this method can reduce the occurrence of serious postoperative complications and provide patients with a good postoperative quality of life. However, the exact efficacy of this procedure is still to be confirmed by the continuous clinical practice of

experienced surgeons and studies in more centers and larger samples. There was no conflict of interest in this study.

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