Result of surgical treatment for pancreatic head cancer

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Received date: 15/9/2022
Accepted date: 25/10/2022
Published date: 31/10/2022

Abstract

Introduction: Surgery is the mainstay of treatment for pancreatic head cancer for improvement of patient survival. Studies in Vietnam have focused less on survival after surgery. Therefore, we conducted a study to evaluate the results of surgical treatment of pancreatic head cancer at Viet Duc Hospital.

Patients and methods: A Retrospective study of patients with pancreatic head cancer have been operated at Viet Duc University Hospital from 01/2014 to 12/2015.

Results: There were 83 pancreatic head cancer patients operated at Viet Duc hospital. The mean age was 57.7 ± 11.5 (age), male and female were 57.8% and 42.2%, respectively. 18.1% of patients had malnutrition before surgery; The rate of tumor resection (Whipple procedure) was 57.9%. The rate of bypass was 36.1%, the rate of exploratory surgery was 6%. The postoperative complications were bleeding, pancreatic leak, Choledochojejunostomy leak accounted for 6%; 3.6% and 1.2%, respectively. The postoperative mortality rate was 2.4%. The mean overall survival time was 12.35 ± 1.36 months; survival rate after 2 years is 20.3%. Factors such as resection of pancreatic head tumor, no lymph node metastasis, and no distant metastasis all increased the patient's survival time ($p<0.05$)

Conclusion: Surgical treatment of pancreatic head cancer is feasible and safe; and pancreaticoduodenectomy increase the patient's survival time

Keywords: pancreatic head cancer, whipple procedure, pancreaticoduodenectomy

Introduction

Pancreatic head cancer is a group of malignant lesions originating from pancreatic head structures including endocrine and exocrine pancreatic cancers, of which exocrine pancreatic cancer accounts for 95%. In terms of location, cancer in the head of the pancreas accounts for 70%, while cancer in the tail of the pancreas accounts for only 30% [1], [2]. Surgery remains the mainstay of treatment for pancreatic head cancer, however, up to 80-90% of patients cannot remove the tumour because of local invasion of the tumour or the presence of metastases at the time of diagnosis [3]. Therefore, most patients receive only incomplete treatment to improve their quality of life. Despite surgical treatment, two-years and three-years survival rates for pancreatic cancer or only about 45.9% and 28%[4], while the five-years survival rate is only13% [6]. In Vietnam, the research on pancreatic head cancer has not been paid enough attention, there are a few studies on pancreatic cancer such as that of Do Truong Son (2004) [1]; Nguyen Minh Hai (2007) [7]. Nguyen

Van Cuong (2009) [8], however, there are limited research results to assess the survival time after surgery for pancreatic head cancer. Therefore, we conducted this study to evaluate the results of surgical treatment of pancreatic head cancer at Viet Duc University Hospital from January 2014 to December 2015.

Methods

Subjects: Patients were diagnosed with pancreatic head cancer and underwent surgery at Viet Duc University Hospital from January 2014 to December 2015.

Inclusion criteria:

The patient is diagnosed with pancreatic head cancer based on:

Pancreatic head mass in diagnostic imaging

Pancreatic head mass found in surgery

Pathologically confirmed pancreatic head cancer

Underwent surgical treatment at Viet Duc Hospital from January 2014 to December 2015.

Exclusion criteria:

Choledochojejunostomy

Distal cholangiocarcinoma

Ampullary cancer

Patients had with no histopathology reports

Methods: A retrospective descriptive observational study with longitudinal follow-up.

Research process: Selecting medical records that meet the inclusion criteria. Collecting data according to the case study form. Evaluating the surgical results by follow-up examination and collecting information from the patient's family (Specific information was obtained from the patient who was invited to a follow-up examination or from the family if the patient died).

Research variables:

Surgical method: pancreaticoduodenectomy, bypass (choledochojejunostomy, gastrojejunostomy, or both).

Early complications: complications related to surgery occur within 30 days after surgery:

Intra-abdominal hemorrhage: According to the classification of the International Study Group of Pancreatic Surgery (ISGPS), early hemorrhage is defined as bleeding within 24 hours after surgery; late hemorrhage is bleeding after 24 hours after surgery; blood flows through external drainage or gathers in the peritoneal cavity.

Pancreatic-anastomotic hemorrhage: Bleeding in the lumen of the gastrointestinal tract from the pancreatic-intestinal or pancreatic-stomach anastomosis.

Pancreatic fistula: According to the International Study Group on Pancreatic Fistula (ISGPF), pancreatic fistula is when the drainage or residual fluid in the abdomen has amylase content 3 times higher than normal after the 3rd day after surgery.

Delayed gastric emptying: It is a condition that requires a gastric tube to reduce pressure beyond the 10th day after surgery or to have a nasogastric tube placed again.

Choledochojejunostomy leak: There is a connection between the inside and outside of the anastomosis confirmed by X-ray check or re-operation.

Postoperative residual abscess: A collection of fluid that needs to be treated with aspiration or drainage.

Surgical site infection: The surgical site is red and pus discharged, and the pus culture was isolated the bacterias.

Postoperative mortality: Death within the first 30 days after surgery from any cause (also count the cases where severe patients were discharged to die at home as request of patient's family.

Survival time and factors affecting the survival time

Statistical analysis:

Statistical analysis was performed using SPSS 20.0 software. Calculating survival time after surgery by Kaplan Meier method with the log-rank test to compare between groups.

Result

From January 2014 to December 2015, 83 patients with pancreatic head cancer were operated at Viet Duc Hospital.

Mean age of patients in the study group: 57.7 ± 11.5 (min- max: 26-83). Male and female were 57.8% and 42.2%, respectively.

Table 1: Surgical methods

Surgical method		n	%
Pancreatectomy tumor resection (Whipple procedure)		48	57,9
Bypass	Choledochojejunostomy	7	8,4
	Gastrojejunostomy	3	3,6
	Both	20	24,1
Exploratory biopsy surgery + jejunostomy		5	6
Total		83	100

Comment: The rate of tumor resection (Whipple procedure) was 57.9%

Short-Term Results:

The postoperative mortality rate was 2% (2 cases):

One patient was complicated the injury to the right hepatic artery during surgery, (failure of reconstruction of right hepatic artery). After surgery, the patient appeared liver failure, kidney failure. He was treated in the ICU but did not improve and was discharged to die at home as request of family.

One patient with hemorrhagic shock due to bleeding from the pancreatico-intestinal junction: the patient appeared fatigued, pallor and black stools on the 7th day after surgery. The patient was resuscitated and received blood transfusion, but his general condition did not improve. On the 14th day, the patient appeared hypotension, tachycardia, hematemesis, and abdominal distension. After treatment, he was not recovered, and was discharged home, according to the wishes of the family.

Table 2: Postoperative complications

Complication	n	%
Intra-abdominal hemorrhage	2	2,4
Pancreatic-anastomotic hemorrhage	3	3,6
Pancreatic-anastomotic leak	3	3,6
Gastroparesis	5	6,0
Biliary-anastomotic leak	1	1,2
Postoperative residual abscess	2	2,4
Surgical site infections	6	7,2

Comment: The rate of intra-abdominal hemorrhage was 2.4%, Pancreatic-anastomotic hemorrhage was 3.6%; Pancreatic-anastomotic leak was 3.6%; Biliary-anastomotic leak was 1.2%.

Long-Term Results: 8 patients could not be contacted during the follow-up period, the number of patients tracked was 73 patients. The tracking rate achieved was 90.1%, the missing rate was 9.9%.

Overall survival time: The mean overall survival time was 12.35 ± 1.36 months; survival rate after 2 years is 20.3%. (Table 3)

Table 3: Factors affecting survival time

Prognostic factors		Number of patients	Overall survival time		Survival rate after 2 years (%)	p
			TB ± SD	Min-Max		
Distant metastasis (n=73)	Yes	29	6,14 ± 1,14	1 - 19	0	0
	No	44	16,12 ± 1,82	1 - 31	31,5	
Resection of pancreatic head tumor (n=73)	Yes	41	17,2 ± 1,86	1 - 31	33,8	0
	No	32	5,8 ± 1,1	1 - 19	0	
Lymph node metastasis (n=41)	Yes	28	13,16 ± 1,93	1 - 27	16,9	0,028
	No	13	22,65 ± 2,29	8 - 31	44,9	

Comment: The mean overall survival time had a statistically significant difference between the groups distant metastasis factor, resection of pancreatic head tumor factor and lymph node metastasis factor.

Discussion

As for surgical treatment of pancreatic head cancer, depending on tumor locations, cancer stage, experience of surgeons, hospital anesthesia capacity and particular patients condition, different surgical approaches could be applying, such as pancreaticoduodenectomy, bypass, exploratory surgery and biopsy only. According to our research, the rate of tumor resection (Whipple procedure) was 57,9% (table 1). Whereas, the numbers were 62% and 66,4% according to Nguyen Van Cuong and Yang SJ et al. (2016), respectively. It is noticeable that pancreatic cancer prognosis is poor, the rate of tumor resection is slightly more than 50%. The study shows that the major reason that pancreaticoduodenectomy was not implemented because the metastases were in metastasis liver and peritoneum accounts for 77,1% and tumor spread to local organs only makes up 20%. As for other procedures needed when tumors were not resected, there are 35 cases eligible in which 5 were required with exploratory surgeries and biopsy, the remaining 30 cases were implemented with bypass procedures in order to deal the obstruction in bile tract and duodenum. According to Kuhlmann, the rate of bypass procedures with 1 and 2 loops are 14% and 86%, respectively. The difference between two numbers could be explained by the fact that overseas surgeons are more prone to implement choldecho-enterostomy and duodenoenterostomy simultaneously regardless of bile tract not being obstructed and no pyloric stenosis occurring. However, in Vietnam, depending on surgeon experience, such procedures are needed when complications show up.

Surgical technique, surgeon's experience, and postoperative care are important factors to ensure the safety of difficult and complicated surgeries such as pancreaticoduodenectomy. Regarding postoperative complications (Table 2): the overall hemorrhage rate was 6% (including 2 patients with intra-abdominal hemorrhage and 3 patients with pancreatic-anastomotic hemorrhage), including one patient with bleeding from the pancreatico-intestinal junction who died after surgery, one patient with intra-abdominal hemorrhage on the 2nd day and had to be re-operated to stop the hemorrhage; The remaining 3 patients were all recovered after treatment medically. There were 3 cases of Pancreatic-anastomotic leak (3.6%) and one case of choledochojejunostomy leak (1.2%) were all recovered after treatment medically; 2 cases of residual abscess were aspirated by ultrasound-guided and treated with antibiotics. The gastroparesis was appeared in 5 patients, accounting for 6%. In the study, there were 2 patients who died after surgery (2.4%), one patient we injured to the right hepatic artery during surgery, after surgery, the patient had liver and kidney failure and one patient with hemorrhagic shock caused blood loss due to hemorrhage from the pancreatico-intestinal junction after surgery. According to Trinh Hong Son summarizing through 79 cases of pancreaticoduodenectomy, the rate of abdominal hemorrhage was 2.5%, there were no cases of pancreatic anastomotic leak or residual abscess [10]. In the study of Pham The Anh, the hemorrhage rate was 10%, pancreatic anastomotic leak was 6.7% [11]. According to Jun Gong (2013), the rate of pancreatic anastomotic leak was 5.38%, bile was leak 3%, hemorrhage was 3.23%, pyloric retardation was 9.68%, residual abscess was 0% [12]. Through this research, we can conclude that the surgical technique of pancreaticoduodenectomy has been applying and getting better, the serious complications after surgery such as hemorrhage, choledochojejunostomy leak, pancreatic-anastomotic leak are less than 10%. According to our experience, to limit hemorrhage from the pancreatic anastomosis junction, surgeons should suture the pancreatectomy with Prolen 4-0, 5-0; and the pancreatic-intestinal junction appears to bleed less than the pancreatic-gastric junction.

At the end of the study, after excluding 2 patients who died after surgery, 8 patients had no monitored follow-up, and the overall follow-up rate of the study was 90.1%. The mean overall survival time

was 12.35 ± 1.36 months, the two year survival rate was 20.3%. The mean survival time of the pancreaticoduodenectomy group was 17.2 ± 1.86 months, and the 2-year survival rate was 33.8%, and there was a difference with the group that not resection of pancreatic head tumor (p = 0.000). This result is similar to Kuhlmann's study, the mean survival time in the pancreaticoduodenectomy group was 17.0 months with a 2-year survival rate of 34%; while in the bypass group was 7.5 months and 3% [5]. According to Jun Gong, the mean survival time of the group of tumour resections with standard lymphadenectomy was 19.8 months; and that of the group with enlarged lymph node dissection was 23.2 months [12]. Thus, in addition to tumour resection, standard or enlarged lymph node dissection also increases the patient's survival time. The patients in our study have not been focused on lymph node dissection, so the survival time is lower than that of in the internal reports. Factors such as lymph node metastasis, or distant metastasis are all poor prognostic factors, reducing the patient's survival time. Our study also was similar results to Kuhlmann [5] and Cameron [13], the group with lymph node metastasis, and the distant metastasis group had a shorter survival time than the group without lymph node metastasis, and the group without distant metastasis (p < 0.05). Thus, screening and detecting tumours at an early stage for timely treatment helps to increase the patient's survival time.

Conclusion

Surgical treatment of pancreatic head cancer has faced challenges regarding high postoperative complication rate and life-threatening complications. Even though pancreaticoduodenectomy has still been a priority method to treat pancreatic head cancer, the rate of tumor resection is low and post-operative survival time is short regardless of tumors being removed. To improve the outcomes of surgical treatment of pancreatic head cancer, it is necessary to further research on lymphadenectomy, treatments for metastasis, additional treatments including chemotherapy, immunotherapy, and targeted therapy.

Conflict of interest: The authors declare that they have no conflict of interest.

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