

**Pancreatic Fistula Post Duodenopancreatectomy Experience Within
The Oncological Surgery Service Hpb, Hospital Nossa Senhora Da
Conceição from January 2018 to January 2023**

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Abstract

Introduction: Pancreaticoduodenectomy (PD) is a surgical procedure used to treat periampullary disease. Among its complications, postoperative pancreatic fistula (POPF) is the most common and potentially serious.

Objective: To Identify prevalence of POPF and its risk factors in patients undergoing PD within the oncological surgery service at Hospital Conceição.

Method: Retrospective and descriptive study of patients undergoing PD in our service between 2018 and 2023 with analysis collected in the hospital's electronic medical record.

Results: During this period, 37 patients underwent PD; of these, 54.05% did not develop POPF, 13.51% had Biochemical Leak and 32.43 had clinically relevant POPF.

Conclusion: The study allowed us to evaluate the prevalence of POPF and identify modifiable risk factors in our population with the objective to reduce its incidence in the future.

Keywords: Pancreaticoduodenectomy; Pancreatic leak; Pancreatic cancer

Introduction

Pancreaticoduodenectomy (DPT) is a complex surgical procedure performed to treat some benign, premalignant and malignant diseases located in the head of the pancreas and in periampullary topography [1]. Although technical advances have reduced the mortality rate in recent years, the morbidity rate remains high, reaching rates greater than 50%, even in reference centers [2]. Among the complications related to the surgical procedure, Postoperative Pancreatic Fistula (POPF) is the most common complication of DPT [3] and, when clinically relevant, it induces the formation of abscesses and hemorrhage that can lead the patient to sepsis, multiple failure of organ and death [4]. Several risk factors have been associated with the formation of anastomotic fistula after DPT, such as patient-associated factors (age, BMI and nutritional status), perioperative factors (neoadjuvance and bilirubin levels and pre-surgical creatinine) and factors associated with the surgeon (time of experience, anastomotic technique and trans-operative bleeding) [5,6]. With this in

mind, identifying the prevalence of POPF in the population of patients undergoing DPT in the oncological surgery service at Hospital Conceição, as well as its modifiable risk factors in order to reduce the rate of this pathology, can contribute to the implementation of measures that improve results of the service and reduce hospital costs in the future.

Objective

The objective of this study was to evaluate the risk factors associated with the development of POPF, as well as its prevalence in patients undergoing DPT in the oncological surgery service at Hospital Conceição from January 2018 to December 2022.

Methods

This was a descriptive cross-sectional study of patients undergoing DPT in the oncological surgery service at Hospital Conceição in the period between January 2018 and December 2022. Data were collected between August and October 2023 in the hospital's electronic medical record. Patients undergoing surgery for non-oncological purposes and with resection of multiple organs were excluded from the study. All patients signed the informed consent form before the surgical procedure.

Surgical procedure and post-operative management

Radical surgery with conventional retroperitoneal lymphadenectomy was proposed in all cases. All surgical procedures were performed by a senior surgeon and three residents; During surgery, two abdominal drains were positioned, one anterior and one posterior to the pancreatic anastomosis. All patients received nutritional support before and after surgery. They were also subjected to collection of fluid samples from abdominal drains on the 1st, 3rd and 5th post-operative period in order to quantify amylase. For the analysis, the highest quantified amylase result was considered.

Variables analyzed

The clinical variables analyzed were age, sex, BMI, presence of diabetes, level of pre-operative malnutrition, level of pre-operative bilirubinemia, presence or absence of pre-surgical bile duct drainage and diameter of the pancreatic duct on imaging examination. staging. The intraoperative variables analyzed were surgical time, bleeding volume, anastomosis technique and number of lymph nodes present in the lymphadenectomy. The postoperative variables analyzed were the length of hospital stay, the clinical outcome and the development or not of a pancreatic fistula. When a fistula appeared, it was classified as defined by the International Study Group on Pancreatic Fistula (ISGPF) in 2016, being divided into Biochemical Leak (BL), Fistula B and Fistula C used in the preparation of tables that demonstrate the experience of the our service.

Statistical analysis

The quantitative variables were analyzed by calculating their average appearance and the qualitative variables were described according to their frequency of appearance in the study population using Excel.

Results

From January 2018 to December 2022, 37 patients underwent DPT at the oncological surgery service at Hospital Nossa Senhora da Conceição due to malignant or pre-malignant disease of the pancreatic head and periampullary. The clinical information of the patients included in the study is described in [Table 1](#) (gender, age, DM2, ASA, nutrition).

Table 1: Clinical information of the patients included.

Parameters	All patients (37)
Age	
≥65	11 (29.73%)
<65	26 (70.27%)
Gender	

Male	20 (54.5%)
Female	17 (45.95%)
Diabetes	
Yes	11 (29.73%)
No	16 (70.27%)
ASA score	
I	1 (2.70%)
II	23 (62.16%)
III	13 (35.14%)
Nutrition	
Severe malnutrition	3 (8.11%)
Moderate malnutrition	17 (45.95%)
Mild malnutrition	7 (18.92%)
No malnutrition	10 (27.03%)

Of the 37 patients operated on, 26 (70.27%) had neoplasia of the head of the pancreas, 9 (24.32%) neoplasia of the duodenum and 2 (5.41%) neoplasia of the distal bile duct. Regarding the development of a fistula, of the 37 patients included in the study, 54.05% did not develop a pancreatic fistula postoperatively, 13.51% had a Biochemical Leak, 10.81% had a type B fistula and 21.62% had a type C fistula. Information related to the surgical procedure is shown in **Table 2** (lymphadenectomy, surgical margins, time, bleeding, vascular reconstruction).

Table 2: Information related to the surgical procedure.

Parameters	All patients (37)
Lymphadenectomy	
Greater than or equal to 12 LFN	14 (37.84%)
Less than 12 LFN 23	23 (62.16%)
Free Margins	
With Free Margins	34 (91.89%)
No Free Margins	3 (8.11)
Vascular reconstruction	
With Reconstruction	4 (10.81%)
No Reconstruction	33 (89.19%)

Of the 37 patients included in the study, 6 (16.21%) underwent neoadjuvant treatment. Of these, none presented a pancreatic fistula with clinical repercussions (type B or C fistula). Of the 21 patients who underwent upfront surgery, 15 did not develop a postoperative pancreatic fistula and 4 presented a Biochemical Leak. Regarding the technique used to perform pancreatic anastomosis, as described in graph 1, 25 (67.57%) of the 37 patients underwent the modified Blumgart technique. Of these, 20 did not develop a pancreatic fistula postoperatively or presented BL. Of the 12 (32.43%) who developed a clinically relevant fistula (type B or type C), 5 underwent the Modified Blumgart technique, 4 underwent the pancreato-gastro anastomosis and 3 to ductomucosal anastomosis. None of the patients in the study underwent telescoping. Regarding the average number of days in hospital, patients who did not have a fistula or who had BL spent fewer days in hospital (on average 17.4 days) compared to those who had a type B fistula (average of 27.3 days) or fistula type C (average of 35 days). Furthermore, of the 37 patients included in the study, only 5 died and all who died in the postoperative period had a type C fistula. The diameter of the pancreatic duct was

measured on preoperative imaging studies. Of the 37 patients, 25 (67.57%) had a diameter >5mm and 12 (32.43%) had a diameter <5mm. The development of a pancreatic fistula in the postoperative period was inversely associated with the diameter of the pancreatic duct: of the 37 patients in the study, X patients had a type B fistula and of these, all had a duct diameter < 5mm. Furthermore, Y patients had type C fistula, of which Z had a diameter >5mm.

Discussion

New and important aspects, compare, limitations, clinical implications, recommendations for future studies. This was the first study carried out in the oncological surgery service at Hospital Conceição analyzing the number of patients undergoing DPT in our service, seeing which ones developed postoperative pancreatic fistula, trying to identify the main risk factors involved in our patient population. Between 2018 and 2022, 37 patients underwent DPT in our service, of which 32.43% developed clinically relevant POPF postoperatively, a rate that was higher than that described in other studies in the literature [7,8]. This may be associated with the fact that our team consists of a senior surgeon and two residents and the anastomosis is routinely performed by the resident and not by the most experienced surgeon as this is a teaching center. Despite this, we also observed that our sample corroborates other studies regarding the association between the development of POPF, the surgical technique performed for pancreatic anastomosis and the size of the main pancreatic duct [8,9]. Of the 37 operated patients, 54% (20) did not develop POPF. Of those that developed, most had a main pancreatic duct <5mm inferred on preoperative imaging. Furthermore, in our service we routinely perform the modified Blumgart technique for pancreatoanastomosis, leaving other techniques such as gastroanastomosis and ductomucosal anastomosis for exceptional cases such as those in which the pancreatic duct cannot be adequately identified or is very thin. As can be seen, of the 12 patients who developed clinically relevant POPF, 7 underwent one of these techniques for pancreatic anastomosis. Regarding the clinical characteristics of our patients, they also corroborate other studies: our sample was mostly composed of women (54%), patients under 65 years of age (70%) and with good nutritional status [5,8]. Therefore, our population was not a confounding factor in this study. DPT is a complex surgical procedure that requires an advanced surgical technique, favorable clinical and anatomical conditions, as well as an organized and multidisciplinary service in large specialized centers. With this in mind, studying the cases of POPF associated with this procedure, seeking to identify the modifiable risk factors in our population, may allow interventions to be carried out to reduce the incidence of this complication, which is frequent and decisive for the patient's surgical prognosis, allowing reducing the morbidity and mortality in our service.

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