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Original Research

The outcomes and complications of pancreaticoduodenectomy (Whipple procedure): Cross sectional study

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ABSTRACT

Background: Pancreaticoduodenectomy (PD) is one of the most difficult and complex surgery that carries a high rate of major complications, including delayed gastric emptying (DGE), pancreatic fistula, bleeding, intra-abdominal collection, and pulmonary complications. In this study, we have tried to demonstrate the outcomes, and rates of complications from patients who had undergone this procedure by our surgical team.

Materials and Methods: This retrospective study has been constructed on 98 patients who underwent pancreaticoduodenectomy from May 2010 to November 2017 in three different hospitals of the Sulaimanyah governorate in the Kurdistan region of Iraq by the same surgical team. Data was collected from the medical records of patients. A preoperative work up had done for all patients, including those who are necessary for anesthesia fitness and those for staging assessment. None of the operated patients received any types of neoadjuvant therapy.

Result: Out of all 98 patients who underwent PD, the most common complication was wound infection (23.5%), followed by pancreatic leak (21.4%). The pulmonary complication rate was 17.3%, while the intra-abdominal collection rate was 12.2%. In 12.2% of our patients we faced postoperative bleeding, with five patients having to be reopened for this reason. About 77.3% of patients that underwent preoperative ERCP had difficult bile duct dissection. There was an association between preoperative ERCP and difficult bile duct dissection (P Value < 0.001).

Conclusion: Outcomes of our surgical team compared to the published data of some other centers. Preoperative ERCP seems to make difficulty in bile duct dissection during PD.

1. Introduction

Pancreaticoduodenectomy (PD) is a complex surgery, commonly performed for malignant tumors of pancreatic head, ampulla, distal bile duct, and may be performed for benign tumors, and trauma of pancreatic head and duodenum, while rarely perform for chronic pancreatitis [1,2]. This procedure is associated with significant postoperative morbidity, rates of which range from 30% to 60% [3–6]. Major postoperative complications from this procedure include: pancreatic leak or fistula, intra-abdominal abscess, bile leak, postoperative hemorrhage requiring blood transfusion or reopening, delayed gastric emptying, and complications related to the surgical site:- such as infection and wound dehiscence [3,7]. With moves forward and the progress of surgical techniques and improvements in perioperative and critical cares, the mortality and morbidity rates have fallen [4]. Unfortunately, in the Kurdistan region and Iraq there is limited statistical data published internationally regarding the complications rates of PD. The studies are usually based on the knowledge of other centers of western countries, where there is a substantial difference between our center and western centers with respect to perioperative care, which may affect the complications rate and their management. Our surgical team was doing pancreaticoduodenectomies for a long period and it is necessary to find the outcomes of this procedure in our patients. However, there is no published data by our team regarding this subject. The purpose of this article is to estimate the rates of major complications from PDs that had been done by our surgical team, as well as,

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comparing the outcomes with other western literatures in spite of the significant differences of perioperative and critical care management. In addition, we explain some of our impressions of this issue.

2. Materials and Methods

This work has been reported in line with the STROCSS criteria [8]. This retrospective study has been performed on 98 patients who underwent a classic Whipple pancreaticoduodenectomy or pylorus preserving pancreaticoduodenectomy (PPPD) for both benign and malignant tumors by the same surgical team in three different hospitals in the Sulaimanyah governorate in Iraq, from May 2010 to November 2017.

2.1. Data collection

Patients' data were collected using patients' records focusing on demographic characteristics, intraoperative findings and postoperative complications. The impress of the surgical team on the consistency of pancreas according to the non-standardized measure, such as (soft, firm), and pancreatic duct dilatation was extracted from the operative notes, which was observed by the surgical team. In this study, all patients were included who underwent (PD) by this surgical team after exclusion of patients with missing information from their data registries. Some data were gathered through telephone calls with the patients or accompanies, where ever it was possible.

2.2. Preoperative workup

All patients who were candidates for (PD), submitted to complete blood count, liver function test, renal function test, thyroid function test, serum electrolytes, coagulation profile, electrocardiography, and chest x-ray as a preoperative workup for anesthesia fitness. Regarding the staging of the tumor, all patients were assessed preoperatively by computed tomography scanning, magnetic resonance imaging, and endoscopic ultrasonography for some patients, accordingly. Preoperative ERCP with biliary stent insertion was carried out for some cases as a therapeutic biliary drainage measure for jaundice or cholangitis. All patients who underwent ERCP, underwent biliary stent insertion as well.

2.3. Surgical technique

All patients received prophylactic antibiotics (Ceftriaxone + Metronidazole) 30–60 min before the skin incision. Usually, we used an upper midline incision for their exploration. The peritoneum and liver were assessed for the presence of metastasis and the tumor for the respectability. The surgical team observed the pancreatic paraechymal texture, pancreatic duct size, and any difficulties of bile duct dissection during the procedure. Regarding the reconstructions, we used pancreaticojejunostomy in the form of end-to-side anastomosis over an internal drain (NG tube 6Fr.). A duct to mucosa anastomosis was carried out by interrupted non-absorbable (Prolene 5/0) sutures, while the second layer was performed by interrupted non-absorbable (Prolene 4/0) between the anterolateral edges of pancreatic parenchyma with seromuscular layer of the jejunum without suturing the posterior edge of the pancreatic parenchyma. In cases, of small pancreatic ducts we used 4 sutures, while in dilated ducts; 6–8 sutures were used. Then we performed a loop gastrojejunostomy and Roux-en-Y hepaticojejunostomy end-to-side anastomosis fashion. In all patients, either a Penrose drain or a corrugated drain was employed in hepatorenal recess (Morrison's pouch). All patients had no NG tube, neither intraoperative nor postoperative. None of the operated patients received any types of neoadjuvant therapy. The samples were sent for histopathological examination to confirm the type and pathological characteristics of the tumor. Mortality and morbidity were estimated within 30 days postoperatively either during hospital stay or readmission. Imaging techniques, such as ultrasonography and CT scan were used for detecting any intra-abdominal collections.

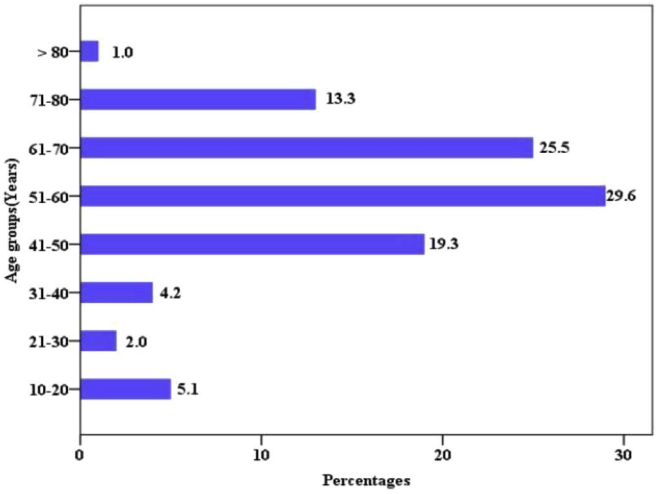

Fig. 1. A distribution of patients' age groups.

2.4. Data analysis

Data analysis was performed using SPSS (version 22) program. The qualitative variables were expressed by number and percentage, whereas, the continuous data were expressed by mean, median, and standard deviation (SD). Chi square test was used to find associations between variables. P-value of < 0.05 was considered as a statistically significant value.

3. Result

During 2010–2017 we managed 98 patients who underwent Whipple procedure. The mean age was 55.9 ± 14.7 years, ranging from 13 to 83 years. Sixty six patients were males and 32 patients were females with male: female ratio (2:1). The most common age groups in our patients were between 51 and 60 years (Fig. 1). The most common symptoms that made the patients seek medical help was jaundice (82.7%), followed by anorexia with weight loss (77.6%), while the least presenting symptoms were gastrointestinal bleeding (6.1%) (Table 1).

3.1. Preoperative factors

The median of preoperative serum bilirubin was 9.9 mg/dl and about 22.4% of patients underwent preoperative ERCP as a temporary modality for biliary drainage (Table 2).

Table 1
Showing patients' demography and symptoms.

Variables	Values
Age	55.9 ± 14.7(13–83)
Sex (%)	
Male	66 (67.3)
Female	32 (32.7)
Smoker (%)	30 (30.6)
Symptoms (%)	
Jaundice	81 (82.7)
Anorexia & Weight loss	76 (77.6)
Abdominal pain	48 (48.9)
Gastric Outlet Obstruction	7 (7.1)
GI bleeding	6 (6.1)