

Duct To Mucosa Pancreatico Gastrostomy With Internal Stenting After Pancreaticoduodenectomy - Retrospective Study Of Outcome In 25 Consecutive Cases.

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Abstract: Pancreatic leak is a potentially lethal complication following pancreatico-duodenectomy. Various techniques for establishing pancreatic enteric continuity are described in the literature. In this study pancreatico-gastrostomy was done by duct to mucosa technique over a stent in 25 consecutive operable cancers of pancreatic head and periampullary region. This study was done at a surgical oncology department in a tertiary care centre by a single surgeon. Most common indication for surgery is periampullary carcinoma. Preoperative internal biliary drainage was done in 12 patients. Fourteen patients had one or more co morbidities. Postoperative morbidity reported in the study ranged between 8 to 48%. Delayed gastric emptying (48%) is the most common complication followed by wound infection (32%), pancreatic leak (8%), intra abdominal collection (8%), and bile leak (4%). Mortality of 4% was reported in the study was comparable with outcomes reported from high volume centers. Stented duct to mucosa pancreatico gastrostomy in this series of 25 cases has yielded results comparable to outcome reported in specialized centers.

Keywords: pancreatico-gastrostomy, pancreatico-duodenectomy, internal stenting.

I. Introduction

Pancreatico-duodenectomy is the only curative treatment for operable cancers affecting periampullary region and head of pancreas. With advancement in surgical technique and perioperative, management mortality has decreased to 5% in high volume centers. Morbidity following this surgery has not decreased significantly and the postoperative complications ranged from 20 to 40 %. Delayed gastric emptying is the most common complication followed by pancreatic anastomotic leak. Delayed gastric emptying is not fatal but leads to delay in starting oral feeds and prolonged hospitalization. Pancreatic leak is the dreaded complication of this surgery, which develops in 11 to 30% of patients and 20% of the patients who develop leak die of this complication. Various surgical technique and preventive measures were described in the literature to minimize this morbidity. In this study, we have retrospectively assessed the safety and outcome of duct to mucosa pancreaticogastrostomy over a stent in a consecutive series of patients who underwent pancreaticoduodenectomy for malignancy.

II. Materials And Method

A retrospective study of 25 consecutive patients who underwent pancreaticoduodenectomy at our department in a tertiary care centre was done with data collected from medical records. The period of study is between 2014 to 2017 January. A single surgeon performed all surgeries.

Pylorus preserving pancreatico duodenectomy was done in all operable patients with obstructive jaundice due to malignancy of periampullary region, head of pancreas and distal common bile duct. Pancreatic-enteric continuity was established by anastomosing pancreatic remnant to posterior wall of stomach. Duct to mucosal approximation was done with 5 -0 polydioxanone suture in an interrupted fashion after placing a 5 French infant feeding tube across the anastomosis and a 2 layered anastomosis was performed. End to side Hepatico jejunostomy was done with proximal end of jejunum with 5-0 polydioxanone suture in an interrupted fashion in single layer. Side to side anterior gastrojejunostomy was performed with distal loop of jejunum using staplers or hand-sewn technique in two layers. Side to side Jejunojejunostomy was performed between the two limbs of jejunal loop. Temporary feeding jejunostomy was performed distal to all the anastomosis for early initiation of enteral nutrition. Drain was kept in the right upper quadrant. Postoperative outcome was evaluated by assessing duration of hospital stay, pancreatic leak, bile leak, intra-abdominal collection, wound infection, hemorrhage in the postoperative period and mortality within 30 days of surgery.

III. Results

Totally 25 consecutive patients who underwent pancreaticoduodenectomy were included in this study. Male patients (n=17) were more than twice the number of female patients (n=8). Periampullary carcinoma was

the most common indication for pancreaticoduodenectomy with 16 patients, followed by eight patients with carcinoma of pancreatic head and one patient with distal common bile duct cholangiocarcinoma.

Table-1. Demographic, disease and preoperative factors

Total number of patients	25
Male	17
female	8
Disease	
Periampullary Carcinoma	16
Carcinoma of pancreatic head	8
Distal common bile duct carcinoma	1
Preoperative biliary drainage	
Done	12
Not done	13
Co morbidities	
Diabetes	12
Diabetes & hypertension	2
Coronary artery disease	1
Synchronous primary Carcinoma rectum	1
No comorbidity	11

Age of the patients ranged between 44 and 65, with a median age of 58. Comorbidities were present in 16 patients and diabetes was the most common comorbidity followed by hypertension and coronary artery disease. One patient had synchronous carcinoma of rectum for which low anterior resection was performed along with pancreaticoduodenectomy. Renal function and coagulation profile were normal in all the patients.

Preoperative internal biliary drainage was done in 12 patients due to elevated bilirubin beyond a 20 mg/dl cut off or in patients planned for neoadjuvant treatment. Mean duration of surgery was 3.5 hours. Average intraoperative blood loss was 500 ml. Blood transfusion was done in two patients with pre existing anemia and operative blood loss more than 650 ml. In the immediate postoperative period, all the patients recovered normally without hemodynamic disturbance or requirement for ventilatory support. Enteral nutrition was initiated 24 hours after surgery through the feeding jejunostomy. Delayed gastric emptying as per international study group for pancreatic surgery definition (requirement of nasogastric tube aspiration for more than 7 days) was observed in 12 patients. Remaining 13 patients were able to tolerate oral feeds before sixth postoperative day. Pancreatic fistula through the main wound requiring total parenteral nutrition and octreotide was observed in one patient. Pancreatic leak documented by amylase rich drain fluid requiring delayed removal of drain was observed in one patient.

Biliary leak through drain was observed in one patient who also had developed pancreatic fistula through the main wound. Superficial site infection was seen in eight patients. Intraabdominal collection was reported in two patients, which was drained by image guided pigtail catheter. No Postoperative hemorrhage was reported in the study group. Non-surgical related death was reported in one patient due to cardiac event on 12th postoperative day. Duration of hospital stay ranged from 12 to 22 days with a median of 15 days.

Table -2. Postoperative outcome

complication	Number of patients (%)
Delayed gastric emptying	12 (48%)
Pancreatic leak	2 (8%)
Biliary leak	1(4%)
Intra abdominal collection	2(8%)
Wound infection	8(32%)
mortality	1(4%)

Total number of patients - 25

IV. Discussion

Post pancreaticoduodenectomy morbidity observed in this study was in the range of 4% to 48%, with delayed gastric emptying being the frequent complication followed by wound infection, pancreatic leak, intra abdominal collection, and bile leak. Mortality of 4% was observed. Various techniques have been described for establishing pancreatic enteric continuity after pancreaticoduodenectomy to reduce the morbidity and mortality. Delayed gastric emptying is the most common morbidity occurring in half of the patients following pancreaticoduodenectomy[1]. Delayed gastric emptying though not fatal leads to prolonged hospitalization and

affects the quality of life. In our study, delayed gastric emptying is reported in 48% of patients. Most of the delayed gastric emptying was of low grade (grade A and B) as per international pancreatic surgery study group definition [2]. Preservation of pylorus and antrum and decrease in delayed gastric emptying is not established. Various studies and Meta analysis yield conflicting results over this issue [3, 4]. Pancreatic gastrostomy was found to produce improved outcome with respect to delayed gastric emptying by decreasing the incidence of postoperative pancreatic fistula [5]. Clinically significant pancreatic leak requiring intervention was observed in 8% of patients.

In this study duct to mucosa, anastomosis is performed over a stent in all the patients combining the benefits of pancreatic gastrostomy, duct to mucosa technique and internal stenting. Pancreatic leak is considered as the Achilles heel in the reconstruction following pancreaticoduodenectomy. Pancreatic anastomotic failure can lead to potentially lethal complication. Various methods and techniques are described to minimize this complication. Pancreatic gastrostomy theoretically has the following advantages: proximity of pancreas to stomach, good vascularity of stomach, acidic environment inactivates pancreatic enzymes and nasogastric decompression can relieve tension on the anastomosis. Randomized trials and metaanalysis show pancreatic gastrostomy decreased the incidence of pancreatic fistula compared to pancreaticojejunostomy [6- 8]. Regarding internal stenting of the anastomosis, earlier non-randomized studies showed decreased leak rate and duration of hospital stay [9, 10]. Several well-designed studies failed to show advantage of internal stenting [11, 12]. Various prospective and retrospective studies evaluating duct to mucosa pancreatic anastomosis showed this technique to be safe and decreased the incidence of complication and mortality [13 -16]. Bile leak rate of 4% is reported in our study is comparable with biliary complications mentioned in the literature [19]. Intraabdominal collection was observed in 8% of the patients that is comparable with similar other studies and it is usually due to leak from the gastrojejunostomy, hepatico jejunostomy, or pancreatic anastomosis [17, 18]. Superficial wound infection was noted in 8 patients accounting for 32%. One patient died in the postoperative period due to nonsurgical cause. Mortality rate of 4% reported in this study is comparable with mortality rate in high volume centers [20].

V. Conclusion

Outcome following duct to mucosa pancreatic gastrostomy with internal stenting after pancreaticoduodenectomy is encouraging. This technique appears to be safe in terms of morbidity, and has yielded mortality rate comparable to specialized high volume center.

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