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Original Research Article

Role of feeding jejunostomy in patients undergoing pancreatoduodenectomy: a single center experience

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ABSTRACT

Background: Concomitant placement of Feeding Jejunostomy (FJ) tubes is common after pancreaticoduodenectomy for optimizing postoperative nutrition. The aim of this study is to determine the role FJ tube placement for postoperative nutrition following pancreaticoduodenectomy.
Methods: All patients undergoing concomitant FJ following pancreaticoduodenectomy (Whipples procedure) from July 2014 to July 2016 were reviewed retrospectively. FJ feeds were routinely started on POD 2. Jejunostomy feeds were discontinued once patient is able to take adequate oral feeds. Data were represented by frequency and mean.
Results: A total of 28 patients underwent pancreaticoduodenectomy in the study period and concomitant FJ was performed in all those patients. A total of 18 (64.3%) were men and mean age was 47.1 years. Majority (25, 89.3%) of these patients had malignancy as an indication for surgery. Only 6 out of 28 (21.4%) patients required nutrition supplementation through FJ on POD 7. Only 2 out of 28 (7.1%) patients required FJ feeds on POD 30. None of these patients had tube related complications in 30-day postoperative period. There was no FJ related mortality in 30-day postoperative period. The patients who required prolonged FJ feeds had grade C pancreatic leak, gastrojejunal anastamotic leak and GJ anastamotic stricture.
Conclusions: Concomitant FJ can be used as a routine in patients undergoing pancreaticoduodenectomy. It is especially beneficial among patients requiring prolonged postoperative nutritional supplementation due to grade c pancreatic leak and gastrojejunal anastamotic leak. Literature review suggested that one third of the nasojejunostomy tubes dislodge and TPN doubles the risk of infection, hence FJ is considered safe and effective adjunct for patients undergoing pancreaticoduodenectomy.

Keywords: FJ feeds, Feeding Jejunostomy tube, Nutrition, Pancreaticoduodenectomy, Pancreatic adenocarcinoma, outcomes

INTRODUCTION

Pancreaticoduodenectomy (PD) is the treatment of choice for resectable tumors of pancreatic head, ampulla, distal common bile duct and duodenum. It is a highly morbid procedure with an estimated morbidity of 30-60% and mortality of 1-5%.[1-3] Patients undergoing whipples resection usually present with malnutrition and weight loss which are associated with suboptimal outcomes following surgery. Early postoperative enteric nutrition decreases wound infection, promotes wound healing and decreases the length of hospital stay.[4-6] Although enteral

nutrition is preferred postoperatively in PD, quite a few of patients will develop complications such as delayed gastric emptying or pancreatic fistula that will limit their ability to achieve adequate caloric intake orally.[7-10] As these complications cannot be expected preoperatively, to optimise perioperative nutrition various alternative strategies have been evaluated, which include total parenteral nutrition and enteral feeding via either nasojejunal tube or percutaneous feeding jejunostomy tube.[7,11-17] Some surgeons perform feeding jejunostomy (FJ) in their patients as a routine after pancreaticoduodenectomy (PD), to ensure enteral route in patients who go on to develop delayed gastric emptying or pancreatic fistula. Given the known constellation of complications associated with feeding jejunostomy placement and its use, it is not clear whether the inclusion of this procedure has any impact on the incidence of early postoperative morbidity post whipples resection. The goal of this study is to evaluate the outcomes associated with feeding jejunostomy tube placement in patients undergoing pancreaticoduodenectomy.

METHODS

The present study is two-year retrospective, single institution, observational review of 28 patients who underwent pancreaticoduodenectomy with feeding jejunostomy between July 2014 to July 2016 in the Department of Surgical Gastroenterology, Bangalore Medical College and Research Institute.

All medical records and surgical notes of these patients were retrieved from hospital information system and reviewed. Demographic data and baseline characteristics were recorded, including age, sex, medical co morbidities, and pathologic diagnosis. All FJ tubes were placed using T-tube by parachuting method 30 cm distal to Gastrojejunal anastamosis. The FJ tube was left in place for a minimum of 6 weeks and typically removed in the office at that time if patient taking adequate oral diet and didn't require any additional enteral supplementation.

All patients were evaluated for FJ tube related complications. Common tube related complications were defined as follows:[8] pericatheter surgical site infection (SSI) was defined as erythema/fluctuation directly adjacent to catheter, requiring at least incision and drainage at the bedside; pneumatosis intestinalis was defined as radiographic findings consistent with air within the bowel wall; severe tube feed intolerance was defined as nausea, vomiting or diarrhea requiring cessation or pausing of tube feeds; and primary catheter malfunction was defined as any mechanical issue (e.g., clogging) that precluded the administration of feeds.

All patients were evaluated for 30-day morbidity as defined by Clavien Dindo classification with those of grade III or higher being reported. Delayed gastric emptying (DGE) and postoperative pancreatic fistula (POPF) were defined according to International study group of pancreatic fistula and International study group of pancreatic surgery respectively.[9,10] Patients were also evaluated for 30-day mortality rate, duration of FJ feeds. The data collected were tabulated and analysed. Data were represented by frequency and mean.

Inclusion criteria

All patients who underwent pancreaticoduodenectomy with concomitant FJ tube placement.

RESULTS

A total of 28 patients underwent pancreaticoduodenectomy during the study period. Males (n = 18, 64.3%) outnumbered the females (n = 10, 35.7%). Baseline characteristics are shown in Table 1.

Table 1: Demographics of the study population.

Variable	Number
Males	18
Females	10
Mean age (in years)	47.1% (36-79)

Indications for pancreaticoduodenectomy are shown in Table 2. Mean age of the patients was 47.1 years. Malignancy was the indication for PD in majority of the patients (n = 25, 89.3%).

Table 2: Indications for pancreaticoduodenectomy.

Diagnosis	
Pancreatic adenocarcinoma	18 (64.2%)
Periampullary carcinoma	3 (10.7%)
Distal cholangiocarcinoma	2 (7.1%)
Duodenal adenocarcinoma	2 (7.1%)
Chronic pancreatitis with head mass	2 (7.1%)
Pancreatic head trauma	1 (3.57%)

Surgical procedure

All patients underwent pancreaticoduodenectomy with FJ tube placed 30 cm distal to gastrojejunal anastamosis using a T tube by parachute method.

All patients underwent an open surgical intervention. Rooftop incision is used to enter the peritoneal cavity. After kocherisation, respectability assessed, pancreas transected at the neck and resected enbloc with gall bladder, distal common bile duct, duodenum and proximal 10 cm of the jejunum.

Pancreatojejunal anastamosis is carried out first followed by end to side choledochojejunostomy and gastrojejunal anastamosis in that order. FJ is fashioned 30 cm distal to GJ anastamosis as described above. Drains are routinely kept near choledochojejunal anastamosis and panceraticojejunal anastamosis.

Postoperative outcomes

All patients were started on FJ feeds on POD1. FJ feed were stopped once the patient is able to tolerate oral diet. All FJ tubes were removed post operatively after 6 weeks. 22 patients were off FJ feeds by POD7. 6 patients were on FJ feeds after POD7. 2 Patients required FJ feeds after POD 30. Duration of FJ feed requirement is depicted in Table 3. Mean days for tolerating oral diet is 7.6 days.

Table 3: Duration of FJ feed requirement in the study population.

Duration	Number
POD 1- POD 7	22
POD 7-POD 30	6
>POD 30	2

Table 4: Causes of 30-day morbidity in the study population.

Cause	N
Delayed gastric emptying	4
POPF grade C	1
Gastrojejunal anastamotic leak	1

30-day morbidity rate is 21.4% (n = 6). Causes of morbidity are delayed gastric emptying in 4 patients. Grade C pancreatic leak in 1 patient and gastrojejunal anastamotic leak in one patient.

Table 5: FJ tube related complications.

Complication	N
Surgical site infection	0
Pneumatosis intestinalis	0
Primary catheter malfunction	0
Tube feed intolerance	0

30-day mortality post pancreaticoduodenectomy is 0%.

DISCUSSION

Patients undergoing Whipple's resection especially for pancreatic adenocarcinoma often present with preoperative weight loss and malnutrition.[11,12] Efforts are made to improve perioperative nutrition so that it can promote healing, enhance recovery and decrease postoperative morbidity.[13-15] Early oral feeding is the optimal strategy for postoperative nutrition. But due to high incidence of delayed gastric emptying and other morbidity related sources of oral feeding intolerance (e.g., POPF and deep SSI), patients are often unable to meet caloric requirements alone from oral diet alone.[16-18] Thus, placement of a feeding Jejunostomy tube at the time of surgery remains common.[19-20] Alternate sources of nutrition such as nasojejunal tube and total parenteral nutrition (TPN) are also used. However, in one study, nasojejunal tubes dislodged in one third of patients and use of TPN doubled the risk of infection.[17] In previous studies, placement of a Jejunostomy tube during pancreatic surgery is associated with inferior outcomes.[15,19,20] Due to discrepant reports in current literature, we tried to assess the impact of FJ tubes on postoperative outcomes of PD.

In this study, 28 patients underwent pancreaticoduodenectomy with feeding Jejunostomy tube placement. Pancreatic ductal adenocarcinoma was the most common indication for performing pancreaticoduodenectomy with feeding Jejunostomy tube placement. No patient developed catheter related morbidity. This is in contrast with the study carried out by Waliye HE et al, where 7% of patients developed catheter related morbidity.[21] 30-day mortality was 0% and 30-day morbidity rate was 21% which is lesser than that seen in the study by Nussbaum et al.[8] Delayed gastric emptying was seen in 4 patients. Grade C POPF is seen in one patient and gastrojejunal anastamotic leak was seen in 1 patient prolonging the duration of FJ feeds.

Limitations of our study include its small size of the study population retrospective nature, limitation to single center and absence of control group to compare the outcomes. Likewise, the effects of FJ placement on surgical complications of PD couldn't be assessed because of the absence of control group. Strict postoperative pathways were not in place during the study period. Hence, randomized studies with larger sample size are required for accurate evaluation of outcomes post FJ tube insertion in PD.

CONCLUSION

Concomitant FJ should be considered in patients undergoing pancreaticoduodenectomy for the improvement of perioperative nutrition as it is not associated with major complications. It is especially beneficial among the patients who are unable to take oral diet because of the complications such as delayed gastric emptying, postoperative pancreatic fistula and gastrojejunal anastamotic leak. Literature review suggested that one third of nasojejunal tubes dislodge and TPN doubles the risk of infection, hence FJ is considered safe and effective adjunct for patients undergoing pancreaticoduodenectomy.

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