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Effects of adding Braun jejuno-jejunostomyto standard Whipple Procedure on reduction of Morbidity

Selvaraj.T, Associate Professor, Department of Surgical gastroenterology, KMC, Chennai-10

Corresponding Author: Dr.Selvaraj.T., Associate professor, Department of surgical gastroenterology, Government Kilpauk medical college,Chennai-10, Tamilnadu.

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Abstract

Background: Whipple operation remains the gold standard treatment modality for periampullary tumour, distal CBD tumour, head of pancreas tumour and duodenal tumours. Though mortality has been brought down significantly ,the morbidity poses a big challenge in the post-operative period in the form of delayed gastric emptying ,severe bile reflux and QOL(recurrent vomiting ,repeated hospital admissions, post cibal discomfort). Braun jejuno-jejunostomy (side-to-side anastomosis of afferent and efferent limbs of thegastrojejunal anastomotic loop) could be performed rapidly which is supposed to help in reducing the morbidity significantly in Whipple surgery

Methods: The aim of the study was to compare the effectiveness of addition ofBraun anastomosis to the Whipple operation with the standard Whipple operation without Braun anastomosis ..This is a retrospective observational study from June 2015 to June 2018.: There were 24 patients who underwent standard Whipple operation without Braun anastomosis and12 patients underwent Braun anastomosis to the standard Whipple operation who were observed and taken up for study to assess the effectiveness in terms of reducing post-operative morbidity ,especially the Delayed gastric emptying, recurrent vomiting and repeated hospital admissions and postoperative QOL

Results: Out of 36patients 14 patients (38.8%) are females and 22 (61.2%) patients are males. Though all patients had similar demographic presentations, those who had Braun anastomosis in addition to standard Whipple operation experienced 0% delayed gastric emptying compared to 20% in standard procedure ,had no leak versus 8.2% leak rate in standard Whipple operation , got delayed discharge only in 8.3% compared to 20.8 %in standard Whipples operation

Conclusions: Addition of Braun Jejuno-Jejunostomy to standard Whipple procedure reduces the incidence of delayed gastric emptying,postoperative alkaline bile reflux, early discharge from the hospital and avoid repeated hospital admissions and improve the Quality of life. But it needs further validation with more volume of cases and randomized trials.

Keyword: Whipple operation; Braun anastomosis in Whipple operation ,Delayed gastric emptying in Whipple operation.

Introduction

Pancreatico-duodenectomy, as first described by Allen Whipple in 1935, is a well-established operation and standard treatment for operable pancreatic head and other periampullarytumours(1-3). Although this operation has a

great impact on treatment and patient survival,the overall mortality after pancreatico-duodenectomy (PD) was 4.1%, and the overall morbidity ranges 15%- 42%.Delayed gastric emptying is considered to be the most frequent complication following Whipple operation(14%) %), which caused significant prolongation of the hospital stay. To reduce these morbidities,different methods of intestinal anastomosis are tried and performed. .Among these different technique, Roux-en-Y method has been reported to reduce postoperative complications of Whipple surgery, especially post-operative pancreatic fistula and delayed gastric emptying. Braun jejunojejunostomy (side-to-side anastomosis of afferent and efferent limbs distal to the gastrojejunostomy site) is less cumbersome to do compared to Roux-en –Y and is functionally equal to Roux-en-Y.

Though Braun enteroenterostomyis one of the simple additional procedure to the major Whipple surgery, it is not being carried out routinely. It is one of the significantfactor associated with the reduced delayed gastric emptying after pancreatico-deudenectomy(4),and there are few reports demonstrating the efficacy of Braun jejunojejunostomy in improving the results of postoperative delayed gastric emptying. We would like to assessand evaluate the efficacy of adding Braun jejunojejunostomy to the standard Whipple surgery in reducing these types of postoperative complications

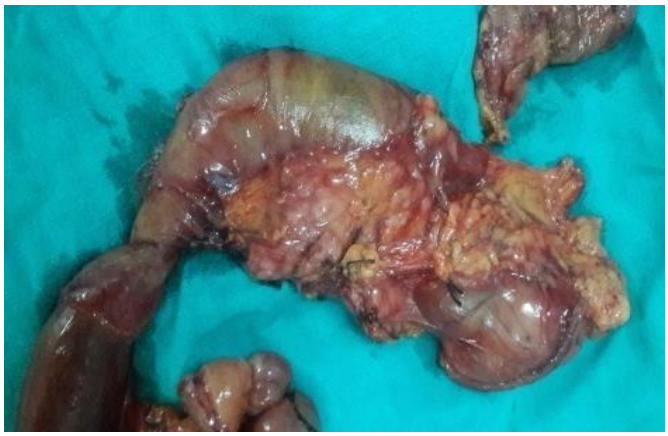
Method

Between June 2015 to June 2018,36 patientsaged 28–74 years with confirmed operable pancreatic head, duodenal or common bile duct tumours were operated for a Whipple procedure.The study was a retrospective observational study in surgical gastroenterology department, at a government tertiary care centre.

The technique

All patients underwent the standard Whipple procedure, including 40% distal gastrectomy, cholecystectomy, pancreaticoduodenectomy and then reconstructed with pancreaticojejunostomy, hepaticojejunostomy and antecolicgastrojejunostomy.

All Pancreaticojejunalanastomoses were performed using the appropriate sized 3/0 or 4/0 round bodied prolene either by duct to mucosa technique in dilated duct or dunking method in undilated duct. Braun jejunojejunostomy was added at the end of the operation.. Jejunojejunostomy was performed using a standard, manual 2-layer technique between the proximal and distal jejunal limbs about 30 cm distal to the hepaticojejunostomy and 45 cm distal to the gastrojejunostomy sites,



respectively.At the end of the operation 1 tube drain was inserted in the sub hepatic space.

Results

We analysed 36 patients in our study. 24 patients underwent a standard Whipple procedure alone and 12 patients underwent a standard Whipple procedure combined with Braun jejunojejunostomy. . There were no significant differences in baseline demographic and clinical characteristics between the twogroups(Table-1). The most common cause for surgery in both groups was periampullary tumour (n = 22)followed by head of

pancreas tumour (*n*= 8), duodenal tumour (*n* = 3) and bile duct cancer (*n* = 3)**Table-1**

Characteristic	**Braun + Whipple**	**Standard Whipple**
Age(years)	30-71	28-74
Male	7(58.8%)	15(62.5%)
Female	5(41.7)	9(37.5%)
Symptom duration, days	20-90	25-80
Peri-ampullary tumour	8(66.6%)	14(53.8%)
Head of pancreas	2(16.6%)	6(25%)
Distal CBD tumour	1(8.3%)	2(8.3%)
Duodenal tumour	1(8.3%)	2(8.3%)

Table-2

Characteristic	**Braun**	**standard**
Leak	Nil	Pancreatic-1 (4.1%) Bleeding-1 (4.1%)
DGE(delayed gastric emptying)	nil	5(20%)
Endoscopic Bile Reflux	2(16%)	8(33.3%)
Delayed discharge from hospital	1(8.3%)	5(20.8%)
Repeated admissions	Nil	4(16.6%)

Statistical analysis (Table -2)

Base line demographic and clinical characteristics of participants and post-operative outcomes were analysed retrospectively. In relation to Age and sex ratio there is no significant difference between the two groups. The types of tumours, especially the periampullary carcinoma was more (66.6%) in Braun's anastomosis compared to standard Whipples operation(53.8%). But there was no major differences in the types of tumours between two groups.

Delayed gastric emptying was more prevalent among the standardwhipple procedure (20%) and had more nasogastric drainage volume (> 500ml compared to Braun <200ml) in the post operative period as well as more periods of vomiting after nasogastric tube removal. The standard whipplegroup had endoscopic findings of more severe (33.3%) biliary alkaline reflux gastritis compared to less (16%) incidence of post- operative bile gastritis.

There was one pancreatic leak (4.1%) as well as one bleeding (4.1%) in the post-operative period which required second surgery in the standard whipples procedure compared to no (0%) leak in the braun combined group.

About 20.8% of patients in the standard Whipple group got delayed discharge from the hospital with more morbidity compared to 8.3% of patients from the Braun group. Standard Whipple patients need to get repeated hospital admissions in 16.6 % compared to combined group where there was none required repeated hospital admission.

Discussion

Braun jejuno jejunostomy has been recommended as an adjunct method to a standard Whipple operation to reduce postoperative vomiting episodes,biliary gastritis and the repeat hospital admissions(7-9).It has been reported that Vogel and colleague (7)have shown in their

reports that postoperative complications like alkaline reflux gastritis and bile gastritis were less frequent in patients undergoing Braun jejunojejunostomy . Some studies show that Delayed gastric emptying (DGE) is one of the major complications after pancreaticoduodenectomy (PD), occurring in 14% to 34% of cases.(7)

Another study in their report showed that adding Braun jejunojejunostomy to any type of gastroenterostomy hadsignificantly reduced the biliary reflux.(8).Wang and colleagues(10) documented a lower incidence of vomiting ,biliary reflux gastritis and upper abdominal discomfort after adding Braun anastomosis to a standard Whipple procedure. In the present retrospective observational study, we evaluated the postoperative complications in patients undergoing standard Whipplesoperationwith those patients after adding Braun Jejunal anastomosis to the standard Whipples operation . We also observeda majordifference in nasogastric tube volume and the vomiting after the tube removal more frequently in the standard group. Hochwald and colleagues(11) documented earlier nasogastric tube removal in patients undergoing combined procedure.

Following Whipple surgery, various complications have increased the morbidity rate. Post-operative bleeding, anastomotic leak and delayed gastric emptying have been the prevalent complications of Whipple surgery in one study.(12) In another study, postoperative bleeding was the most common complication after surgery(13) In yet another study(14) fever, pancreatic fistula and increase in bilirubin levels were the prevalent complications (14).In our study the following complications(anastomosis leakage, post-operative gastrointestinal bleeding, and recurrent biliary vomiting) noted were in the standard group only.

In our study, delayed gastric emptying was observed 0% in the combined group compared to 20% in the standard group. Similarly, Hochwald and colleagues(11) and Nikfarjam and colleague also observed that recurrent biliary gastritis was significantly reduced after combined Braun anastomosis. Though post-operative endoscopic findings show alkaline bile reflux gastritis in both the groups, it is more severe and more symptomatic in Standard Whipple procedure compared to Braun anastomosis.

Braun anastomosis has some potential advantages. It tends to stabilize the afferent and efferent limbs of the gastrojejunostomy, so the gastrojejunostomy has a low tendency to twist and angulate. Braun anastomosis prevents any increase in pressure in the biliopancreatic limb if an obstruction occurs at the level of the gastroenterostomy. The Braun anastomosis also allows gastric content to pass distally unimpeded into the efferent limb.

Because of these delayed gastric emptying and and more severe bile reflux gastritis the patients tend to stay for a longer period in the hospital in the standard Whipple operation than the combined group with Broun anastomosis .But the limitation in this study is a small group which needs further validation with large volume and Randomized controlled trials .

Conclusion

,If Braun jejunojejunostomy is added to the standard Whipple operation, compared to standard Whipple procedure it may be associated with lower rates recurrent biliary reflux gastritis and vomiting ,post cabal fullness ,early removal of nasogastric tube , smooth post-operative recovery ,less need for frequent hospitalisations and better quality of life in the remaining days. More studies are necessary to define the role of Braun jejunojejunalanastomois in this regard.

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