SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://saspjournals.com/sasjs/

OPEN ACCESS

Modified Roux en Y Loup (Jaipur Loop) to Prevent Bile Reflux Gastritis in Palliative Triple Bypass

Dr. Ajay Sharma[1*], Dr. Peeyush Varshney[2], Dr. Varun Bajaj[3], Dr. Randhir Singh Rao[4]

[1,2]Assistant Prof Department of Gastrointestinal Surgery, Mahatma Gandhi Medical College Jaipur, Rajasthan, India
[3]Consultant Surgeon, Shalby Multispeciality Hospital Ahemedabad, Gujrat, India
[4]Principal Specialist Surgery, Department of Surgery (Gastrosurgery Unit), SMS Medical College Jaipur, Rajasthan, India

DOI: 10.36347/SASJS.2019.v05i10.006 | **Received:** 16.10.2019 | **Accepted:** 25.10.2019 | **Published:** 30.10.2019

***Corresponding author:** Dr. Ajay Sharma

Abstract **Original Research Article**

Introduction: Triple bypass surgery for an unresectable carcinoma periampullary region need gastric and biliary bypass. These patients frequently have bile reflux into the stomach. This aspect in triple bypass is not frequently discussed. ***Patients and Methods:*** All patients subjected to triple bypass from 2012 to 2017 were included in the study. For initial four years the traditional method of Roux En Y Triple bypass (RYHJ) was used and subsequently in last 4 years the method was changed in which is referred to as Jaipur loup. All patients had been observed for symptoms of bile reflux clinically. UGI endoscopy was done as a routine in all patients in study group. ***Results:*** Total 23 patients had undergone triple bypass. 17 in group 1 and 6 in group 2. Of the 17 patients 3 had vomiting and 5 had reflux gastritis like symptoms in post operative period. None of the 3 patients with vomiting had hold up of bile on oral contrast study. On UGI endoscopy all 3 with vomiting and two with symptoms of reflux had severe bile reflux. In group 2 (with Jaipur loup) with modified anastomosis none had symptoms of vomiting or reflux. At UGI endoscopy none had finding of bile refluxing. ***Conclusion:*** Patients with gastrojejunostomy in the proximal limb 10 from Duodenojejunal junction and having jejunojejunostomy 10 cm distal to duodenojejunostomy site have rapid post operative recovery with no bile reflux.

Key words: Triple bypass, Whipples operation, bile reflux, vomiting, gastritis, Roux en y surgery.

INTRODUCTION

Gastric and biliary bypass (Triple bypass) is frequently required for the patients having unresectable malignant lesion at periampullary region leading to gastric outlet obstruction and biliary obstruction [1]. Patients taken up for resection of mass in the head of pancreas may have unresectable disease detected at laparotomy in 15% of cases [2]. Upto 15-50%% of the patients with carcinoma head of pancreas will develop gastric outlet obstruction [3,4].

Surgical palliation is done at most of the centres if the expected survival is more than 9 months [5]. Roux- en- Y loop was used to prevent the food particles to regurgitate in biliary tree and hence prevent cholangitis. Bile reflux gastritis is seen very frequently after Bilroth 2 reconstruction and is due to exposure of gastric mucosa to bile[1]. During 1970's Roux-en- Y GJ was used to treat alkaline reflux gastritis [6].

PATIENTS AND METHODS

Patient selection – From April 2012 to October 2017All patients of carcinoma periampullary region operated either with the intent of doing curtaive pancreaticoduodenectomy who on laparotomy/laparoscopy found to have unresectable or disseminated disease or patients who were taken up for palliative bypass due to evidence of unresectability on cross sectional imaging. Those patients who were found unresectable or disseminated disease at laparotomy were subjected to RYHJ and GJ.

SURGICAL PROCEDURE

The entire cohort was divided into two groups. Group 1 who underwent traditional conventional bypass (April 2012 to March 2015) and Group 2 who has undergone modified loup bypass (April 2015 to October 2017).

The procedure of Group 1(Figure1) described by conventional bypass [4]. The Jejunum is divided 10 cm distal to the ligament of treitz by stapler blue cartiridge (advent 55 jhonson and jhonson). The distal jejunal limb was taken in reterocolic fashion and HJ (hepaticojejunostomy) was done. Gastrojejunostomy (GJ) was done in the same loop at approximately 35 cm from HJ. GJ was done reterocolic isoperistaltic fashion in single layer by continuous suture of polydioxonone 3-0 in all patients. Jejunojejunostomy (JJ) was done in side to side fashion in all patients in single layer continuous suture with polydioxonone 3-0 sutures.

Patients in Group 2 (Figure 2) had the modified by pass (Jaipur loop). Jejunum was divided 30 cm distal to ligament of treitz. The distal jejunal limb was taken in reterocolic fashion and HJ was done. GJ was done in the proximal loop approximately 10 cm from ligament of trietz. GJ was done reterocolic isoperistaltic in single layer by continuous suture of polydioxonone 3-0 in all patients.

Jejunojejunostomy was done in distal jejunal limb at approximately 35 cm from HJ. JJ was done in side to side fashion in all patients in single layer continuous suture with polydioxonone 3-0 sutures.

Post operatively

All patients had ryles tube (RT) removed on postoperative day one, and all patients were started orally on the same day [7-9]. In case of any discomfort in form of retching, nausea, vomiting, pain abdomen, abdominal distension, the feeding was stopped. In case of persistent vomiting RT was reinserted. All patients requiring reinsertion of RT were evaluated by gastrograffin contrast study and upper gastrointestinal endoscopy to ensure there is no mechanical obstruction [7-9]. In case RT was reinserted these patients were managed conservatively with IV fluids, prokinetics and other supportive treatment. They were managed till RT output was decreased to less than 200 ml per day.

Any factors which could lead to decreased gastric emptying or nausea were identified and eliminated. In case of persistence of symptoms upper gastrointestinal (UGI) endoscopy was done. Since the surgical method was changed in the Group 2, all patients in this group underwent UGI endoscopy before discharge as a routine.

RESULTS

All the patients who had undergone triple bypass for unresectable periampullary malignancy from April 2012 till October 2017 were evaluated. Of the total 23 patients who had undergone triple bypass, 17 patients in Group 1(From April 2014 to March 2015) had under gone traditional bypass, subsequently all 6 patients in Group 2 (from April 2015 to October 2017)operated had undergone modified technique. The mean age of patients was 53 years ranging 39 to 74 years? In group 1 the age was 39 to 74 years and in group 2 it was 43 to 70 years. Male is to female ratio was 1.3:1. There were 9 males and 8 females in group 1 and 4 males and 2 females in group 2.

The most common symptoms were Jaundice, pain abdomen, anorexia and pruritus. Based on history and clinical examination a diagnosis of surgically obstructive jaundice was made in all of them and on evaluation all patients had a preoperative diagnosis of periampullary carcinoma. All patients who underwent palliative bypass had primarily carcinoma head of pancreas (Locally advanced or disseminated) except for two patients of which one had ampullary carcinoma with disseminated disease and another had duodenal carcinoma with disseminated disease. Both the patients were in Group 1. Over all 11 patients (8 in Group 1 and 3 in Group 2) had disseminated disease in the form of peritoneal or liver metastasis at laparotomy.

In the post-operative period 3 out of 17 patients in group one had persistent vomiting requiring reinsertion of RT. None of the 3 patients had shown hold up of gastrograffin in the contrast study. UGI endoscopy done in all the 3 patients had bile reflux gastritis. Five more patients in group1 required UGI endoscopy for persistant gastritis like symptoms. Two of these five patients had evidence of bile reflux on UGI endoscopy. These patients were started on pro-kinetic drugs and bile chelating agents. One of these patients had persistent prolonged bile reflux inspite of medical management. All symptom free patients also underwent UGI endoscopy before discharge.

None of the patients in Group 2 had experienced any symptoms of bile reflux. All patients in Group 2 underwent UGI endoscopy and none of them showed features of bile reflux gastritis.

	Group 1, n=17	**Group 2, n=6**	**Overall, n=23**
Age	39-71	43-70	39-74 years
Sex (M:F)	1.1:1	2:1	1.3:1
Etiology HOP Duodenum Ampullary Distal CBD	 16 0 1 0	 5 1 0 0	 21 1 1 0
Pain abdomen	3	2	5
Nausea and Vomiting	17	6	23
Jaundice	17	6	23
Fever	2	1	3
Weight loss	15	4	19
Abdominal mass	6	2	8
Symptom duration in months (range)	1 to 3	2 to 3	1 to 3
Pre-operative biliary drainage for obstructive jaundice/cholangitis	2	2	4
Pre-operative evidence of unresectable disease on cross sectional imaging	0	0	0
Laparotomy/Laparoscopy Unresectable (Locally advanced) Disseminated Liver Peritoneal	9 8 5 3	3 3 2 1	 12 11
Biochemical			
Hemoglobin	6 to 9.2	5.6 to 9	5.6 to 9.2
Platlets	0.9 to 3 lakh	0.8 to 2 Lakh	0.8 to 3 Lakh
S. Albumin	1.5 to 2.1	1.4 to 2.6	1.4 to 2.6
Total Bilirubin	3 to 26	2 to 31	2 to 31
Surgical Morbidity			
Post-operative vomiting requiring re insertion of RT	3	0	3
UGIE showing reflux gastritis	14	0	14
Other Bleed SSI Bile leak	 0 0 0	 0 0 0	 0 0 0

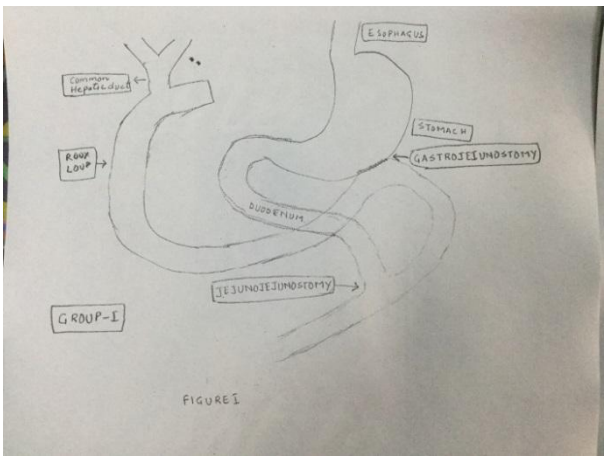

FIGURE 1

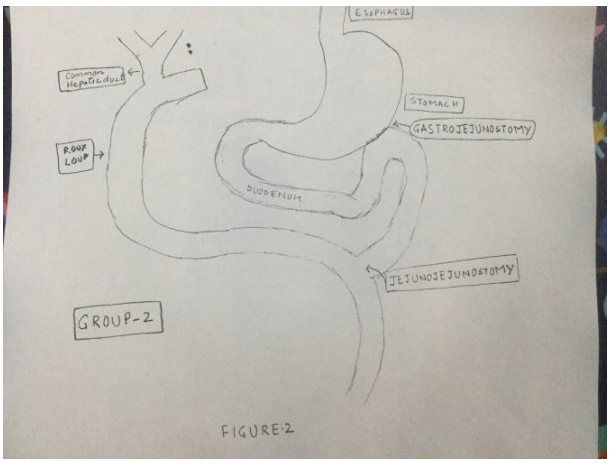

FIGURE 2

DISCUSSION

Maintaining the gastric stump in near-anatomical position, preventing stump retraction and angulation are considered important causes for good

functional results after gastrectomy [10]. In the technique we use, the stomach is anastomosed to the proximal jejunal limb, 10cm distal to dedunojejunal junction. The loop arising from the RYHJ is anastomosed distal to the site of DJ. The distance between Gastrojejunostomy and jejunojeunostomy is approximately 10 cm. This is supposed to prevent the regurgitation of bile into the stomach across gastrojejunostomy[11,12].

Gastritis due to reflux of bile is a well-known entity and is characterised by presence of congestion, mucosal oedema, acute and chronic inflammation [13]. Bile refluxing into stomach is the cause of multiple clinical symptoms, structural changes [13,14]. On reviewing the literature only limited data on bile reflux post Whipple surgery is found. Most of the available data is on gastrectomy for distal gastric or duodenal malignancy. It was found that the Roux en Y loup after distal gastrectomy was used to prevent bile reflux [11,12]. However, this takes longer time and for making of a separate limb in addition to making a Roux loop[11].

Jejunojejunostomy made separately increases surgical time and complications related to it. In comparison to both these techniques, single loop reconstruction that we used is simple and is easy to perform.

Macroscopic bile reflux was noted at UGI endoscopy in 87% of our cases in group 1 and none in group 2 (Jaipur Loop). Bile pooled mainly in the distal stomach in Group 1. Symptomatic as well as asymptomatic bile reflux was seen only in Group 1 patients and none in Group 2 patients.

One of the main drawbacks in the study is that it evaluates a smaller cohort of patients. The Group 1 is the standard technique used by most of the centres but tend to increase the incidence of symptoms of reflux. This symptom is not seen in any of the patients who have undergone Group 2 (Jaipur loop) procedure. Since Triple bypass is the standard technique used in majority of centres for palliation at surgery for advanced unresectable periamplullary carcinoma patients, adding a minor change (Jaipur loop) can be very fruitful in preventing undesired symptoms of reflux in these poor surviving group.

CONCLUSIONS

Patients with gastrojejunostomy in the proximal limb 10 cm from Duodenojejunal junction and having jejunojejunostomy 10 cm distal to duodenojejunostomy site have rapid post-operative recovery with no bile reflux. This technique needs to be evaluated in a larger cohort.

Funding

Self funded

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

Dr Ajay Sharma is the corresponding author. He has coordinated the works done from the beginning to the end. Whipple surgery was performed under his supervision. Data collection, analysis and document works were organised by him. Dr Peeyush Varshney assisted the surgeries. And he also contributed in the data collection. Dr Varun Bajaj is the assistant who was responsible in collecting and entering the data. He also analysed the data and helped in the process of writing the research works. Dr Randhir Singh Rao assisted the surgeries and contributed to data collection. All the authors have read understood and approved the manuscript and its contents.

Competing interests

There is no competing interest in our research.

Consent for publication

All the participants were given prior knowledge about publishing the results after the end of the research.

REFERENCES

1. Kudo Y, Sato N, Tamura T, Hirata K. Triple bypass for advanced pancreatic head cancer associated with biliary stricture, duodenal stenosis, and recurrent obstructive pancreatitis. Surg Case Rep. 2016;2(1):79
2. Lesurtel M, Dehni N, Tiret E, Parc R, Paye F. Palliative surgery for unresectable pancreatic and periampullary cancer: a reappraisal. Journal of gastrointestinal surgery. 2006 Feb 1;10(2):286-91.
3. McGrath C, Tsang A, Nithianandan H, Nguyen E, Bauer P, Dennis K. Malignant Gastric Outlet Obstruction from Pancreatic Cancer. Case Rep Gastroenterol. 2017;11(3):511–515.
4. Gouma DJ, van Geenen R, van Gulik T, de Wit LT, Obertop H. Surgical palliative treatment in bilio-pancreatic malignancy. Annals of oncology. 1999 Jan 1;10(suppl_4):S269-72.
5. Lesurtel M, Dehni N, Tiret E, Parc R, Paye F. Palliative surgery for unresectable pancreatic and periampullary cancer: a reappraisal. Journal of gastrointestinal surgery. 2006 Feb 1;10(2):286-91.
6. Madura JA, Grosfeld JL. Biliary diversion. A new method to prevent enterogastric reflux and reverse the Roux stasis syndrome. Arch Surg. 1997 Mar;132(3):245-9.
7. Watanabe Y, Ohtsuka T, Kimura H, Matsunaga T, Tamura K, Ideno N, Aso T, Miyasaka Y, Ueda J, Takahata S, Tanaka M. Braun enteroenterostomy

reduces delayed gastric emptying after pylorus-preserving pancreatoduodenectomy: a retrospective review. The American Journal of Surgery. 2015 Feb 1;209(2):369-77.

8. Li XB, Lu H, Chen HM, Chen XY, Ge ZZ. Role of bile reflux and Helicobacter pylori infection on inflammation of gastric remnant after distal gastrectomy. Journal of digestive diseases. 2008 Nov;9(4):208-12.
9. Matsumoto I, Shinzeki M, Asari S, Goto T, Shirakawa S, Ajiki T, Fukumoto T, Suzuki Y, Ku Y. A prospective randomized comparison between pylorus- and subtotal stomach- preserving pancreatoduodenectomy on postoperative delayed gastric emptying occurrence and long- term nutritional status. Journal of surgical oncology. 2014 Jun;109(7):690-6.
10. Gangavatiker R, Pal S, Javed A, Dash NR, Sahni P, Chattopadhyay TK. Effect of antecolic or retrocolic reconstruction of the gastro/duodenojejunostomy on delayed gastric emptying after pancreaticoduodenectomy: a randomized controlled trial. Journal of Gastrointestinal Surgery. 2011 May 1;15(5):843-52.
11. Osugi H, Fukuhara K, Takada N, Takemura M, Kinoshita H. Reconstructive procedure after distal gastrectomy to prevent remnant gastritis. Hepato-gastroenterology. 2004;51(58):1215-8.
12. Cabrol JO, Navarro XA, Sancho JO, Simo-Deu JO, Segura RA. Bile reflux in postoperative alkaline reflux gastritis. Annals of surgery. 1990 Feb;211(2):239.
13. Dixon MF, O'connor HJ, Axon AT, King RF, Johnston D. Reflux gastritis: distinct histopathological entity?. Journal of Clinical Pathology. 1986 May 1;39(5):524-30.
14. Ritchie WP. Alkaline reflux gastritis. Can J Surg. 1982;25:248–9.