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Study of Post-Operative Course of Events in Loop Gastrojejunostomy vs Roux-en-Y Gastrojejunostomy in Benign Gastric Outlet Obstruction Disorders

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Abstract: ***Aim of study: To compare the outcome of loop gastrojejunostomy vs Roux-en-Y gastrojejunostomy in terms of post-operative complications like bloating, vomiting, abdominal distension, melena and hematemesis. Objectives of study: To perform upper GI Endoscopy at the end of 1, 3 and 6 months after surgery and look for stomal ulceration, bile reflux, anastomotic site stricture, gastritis and correlate with the symptoms and use as guide in management in the follow up. Materials & Methodology: Data source: Patients from general Surgery and Gastro-surgery department of Civil Hospital Ahmedabad were enrolled in the study from July 2015 to July 2017. Inclusion criteria: Operated cases of loop gastrojejunostomy and Roux-en-Y gastrojejunostomy for benign gastric outlet obstruction above age of 13 years. Exclusion criteria: Cases operated for malignant causes, Age <13years. Results: Alkaline reflux was present in both the groups but the number of patients with alkaline reflux were quite higher in patients operated for loop GJ as compared to Roux-en-Y GJ at the end of 1st month, 3rd month, and 6th month. Conclusion: Roux-en-Y reconstruction can improve the postoperative quality of life owing to less remnant gastritis, reflux esophagitis, dumping symptoms, and reflux symptoms.***

Keywords: Gastric outlet obstruction, Roux-en-Y Gastrojejunostomy, Alkaline reflux oesophagitis

1. Introduction

Intrinsic or extrinsic obstruction of the pyloric channel or duodenum either by benign or malignant diseases leads to gastric outlet obstruction. With improvement in science and technology, the spectrum of gastric outlet obstruction has changed from peptic ulcer disease to corrosives and malignant diseases.

Gastrojejunostomy can be performed with a jejunal loop brought either behind the transverse colon (retrocolic) or in front of it (antecolic). The appropriate positioning of gastrojejunostomy stoma and adequate size ensure good functional outcome. Both loop gastrojeunostomy and roux-en-y gastrojejunostomy are being performed for cases of gastric outlet obstruction, and each having there advantanges and range of complications. The study was done to compare the postoperative complications between the two procedures performed for benign cases.

2. Material

60 patients were selected as per inclusion and exclusion criteria as mentioned above. All patients were randomly categorized in two groups equally, 30 in loop gastrojejunostomy and 30 in Roux-en-Y gastrojejunostomy. This study is prospective study in which each patient was examined immediate post operatively, and at the end of month 1, 3 and 6 months.

3. Results

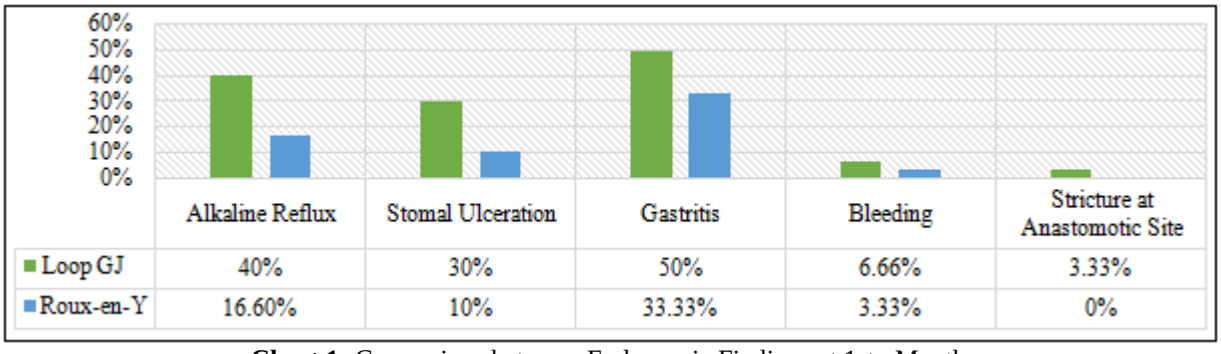

Chart 1: Comparison between Endoscopic Findings at 1st Month

On follow up endoscopy at the end of 1 month, on comparison of both procedures, Alkaline reflux was present in 40% of cases in operated with loop Gastrojejunostomy, while in 16.6% of cases operated with Roux-en-Y GJ.Stomal ulceration was present in 30% of the cases operated with loop GJ, while in 10% of the cases operated with Roex-en-Y GJ. Gastritis was present in 50% of the cases operated with loop gastrojejunostomy, while in 33.3% of the cases operated with Roux-en-Y GJ. Incidence of bleeding was less in both the procedures, 6.6% in case of patients operated with loop GJ and 3.3% in cases operated with Roux-en-Y GJ. Incidence of stricture at anastomotic site was 3.3% in loop GJ, however there was no incidence in cases operated with Roex-en-Y GJ.

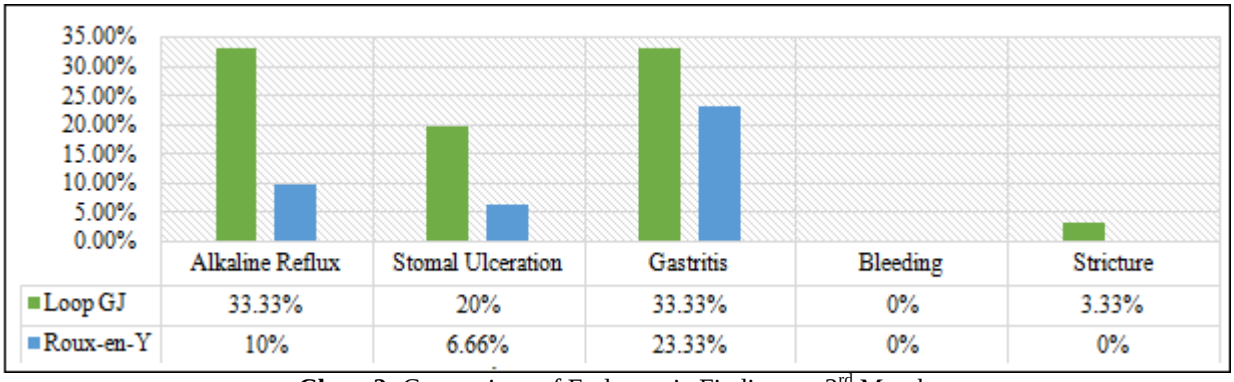

Chart 2: Comparison of Endoscopic Findings at 3rd Month

On follow up endoscopy at the end of 3 months, on comparison of both procedures, Alkaline reflex was still present in 33.3% of cases in operated with loop GJ, while in 10% of cases operated with Roux-en-Y GJ. Stomal ulceration was present in 30% of the cases operated with loop GJ, while it was reduced to 6.6% in the cases operated with Roux-en-Y GJ. Incidence of Gastritis was reduced to 33.33% in the cases operated with loop gastrojejunostomy, while it was present in 23.3% of the cases operated with Roux-en-Y gastrojejunostomy. There was no incidence of bleeding in both the procedures at the end of 3 months. Incidence of stricture at anastomotic site was 3.3% in loop GJ, however there was no incidence in cases operated with Roux-en-Y GJ

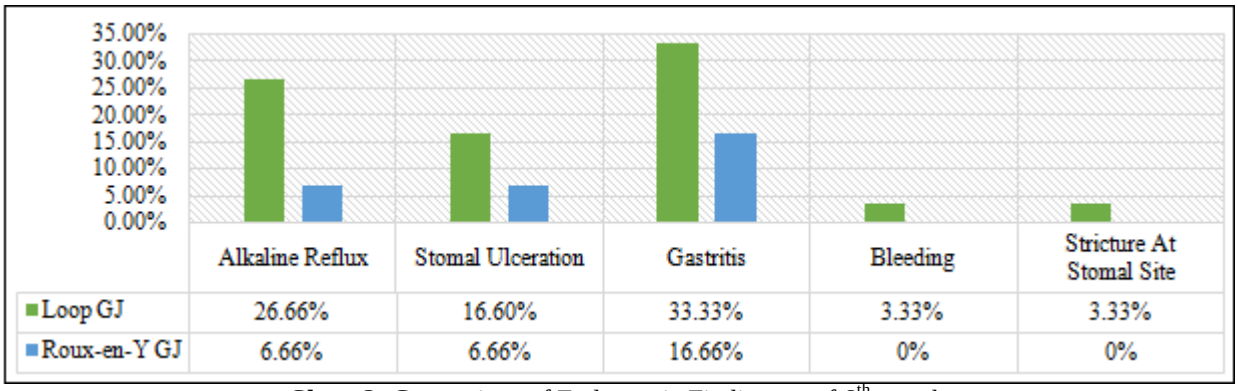

Chart 3: Comparison of Endoscopic Findings at of 6th month

On follow up endoscopy at the end of 6 months, on comparison of both procedures, Alkaline reflex was still present in 26.6% of cases operated with loop GJ, while in 6.6% of cases operated with Roux-en-Y GJ. Stomal ulceration was present in 16.6% of the cases operated with loop GJ, while it remained 6.6% in the cases operated with Roux-en-Y GJ. Incidence of Gastritis was reduced to 33.33% in the cases operated with loop gastrojejunostomy, while it was present in 16.6% of the cases operated with Roux-en-Y GJ. Incidence of bleeding and stricture at anastomotic site was 3.3% each in cases operated with loop gastrojejunostomy, however there was no incidence of bleeding as well as stricture at anastomotic site in cases operated with Roux-en-Y gastrojejunostomy.

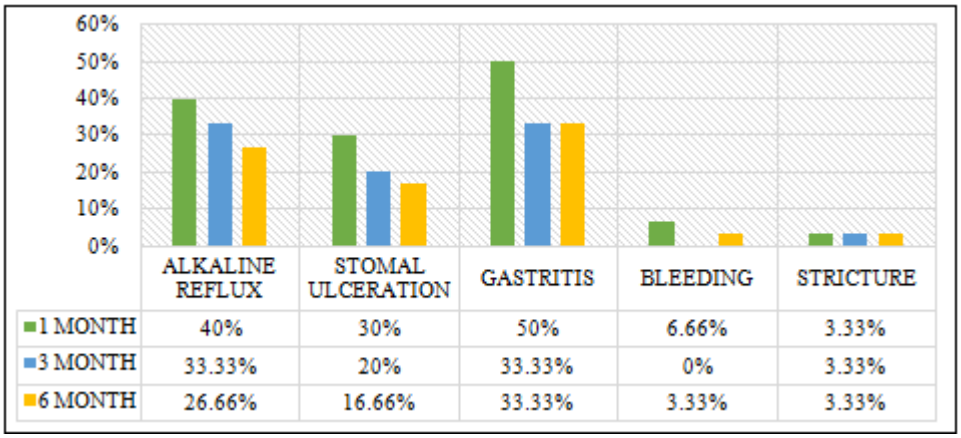

Chart 4: Comparison of Effect of Medical Management at the End of 6 Months in Patients Operated with Loop Gastrojejunostomy

With the use of proton pump inhibitors for the treatment of patients, There is reduction in the incidence of alkaline reflux from 40% at the end of 1st month to 33.3% at the end of 3 months to 26.6% at the end of 6 months., stomal ulceration and gastritis.Incidence of stomal ulceration reduced to 16.6% from 30% at the end of 6 months. Incidence of gastritis reduced from 50% to 33.3% at the end of 3 months, however there was no further reduction at the end of 6 months. Incidence of bleeding reduced to 0% at the end of 3 months from 6.6%, however it again increased to 3.3% at the end of 6 months. There was no change in incidence of anastomotic site stricture at the end of 3 months as well as 6 months on administration of proton pump inhibitors. Regarding management of patients, most of the patients are managed conservatively with oral omeprazole and only 2 patient who were previously operated with loop gastrojejunostomy and were not relieved underwent re-exploration and loop GJ was converted to Roux-en-Y gastrojejunostomy.

4. Discussion

Reflux of alkaline duodenal contents into the stomach and Oesophagus has been recognized as an important complication in patients operated for gastric outlet obstruction. Alkaline components of gastroesophageal reflux may play a critical role in the development of complications leading to ulceration and gastritis with pain. We have performed a prospective study of 60 patients with 30 patients operated for loop GJ and 30 operated for Roux-en-Y GJ. In our study patients were followed up for 6 months at an interval of 1st month, 3rd month, and 6th month in the post-op period. Alkaline reflux was present in both the groups but the number of patients with alkaline reflux were quite higher in patients operated for loop GJ as compared to Roux-en-Y GJ at the end of 1stmonth, 3rd month, and 6th month.

According to a study performed by **Basile Zobolas andGeorge H. Sakorafas et al.** on Alkaline Reflux Gastritis [10] in June 2006.During a 15-year period, 26 patients underwent surgery for the management of refractory alkaline reflux gastritis out of these 22 patients initially underwent a Roux-en-Y GJ and patients were evaluated on basis of detailed history, endoscopy. Out of 26 patients 3 patients (11.5%) were operated with loop gastrojejunostomy. The patients underwent remedial gastric surgery when conservative management was ineffective and the patient's symptoms—despite medical treatment—persisted for at least 2 years and affected quality of life.

In our study none of the patients with Roux-en-Y GJ was having intractable symptoms over a period of 1 year and none underwent a revision surgery. However prolonged follow up is necessary as suggested by the comparativestudy.Only in 2 cases out of 30 cases of (6.66%) loop gastrojejunostomy underwent re-surgery and conversion to Roux-en-Y GJ due to intractable symptoms.

Siddique SS, Feuerstein JD. Gastrointestinal complications of Roux-en-Y gastric bypass surgery. OA Minimally Invasive Surgery 2014 Jan 18;2Gastrointestinal bleeding (GIB) after RYGB can be life threatening if not recognized and treated early. This can present as an early or late complication. Early GIB usually develops along the anastomotic staple lines. Most common form of late GIB is a marginal ulcer (MU). MU develops at the gastrojejunal anastomosis, and may occur in up to 20% of cases[11,12]. They are typically from 4 to 10 weeks after surgery but can develop at any time [13]. The pathophysiology of this ulcer is unclear and are most likely multifactorial with a significant component of ischaemia, acid exposure, alkaline reflux and foreign body reaction from sutures.

The incidence of a stricture of the gastrojejunal anastomosis ranges from 2.9% to 23.0% of patients and has been noted to be substantially more frequent with the laparoscopic than the open approach [14,15]. They typically develop between 4-10 weeks postoperatively.

Postulated mechanisms include post-procedure ischemia causing scarring, chronic ischemia resulting from tension at the anastomosis, decreased healing capacity of individual patients, non-ischemic excessive scar formation, recurrent marginal ulcers, tension or malposition of the anastomosis, and surgical technique.

Patients with anastomotic stricture may present weeks to months postoperatively with progressive dysphagia, postprandial vomiting, bloating, and upper abdominal pain. Obstructive symptoms from strictures at the gastrojejunal anastomosis tend to develop shortly after meals, whereas

vomiting associated with strictures at the jejunojejunal anastomosis occur 1 hour or more after meals. Diagnostic upper endoscopy should be performed in all suspected cases.

Complications in Roux-en-Y gastrojejunostomy	Our study (at end of 6 months)	Siddique SS, Feuerstein JD[11,12,13]
Stricture	0%	2.9%
Bleeding	0%	0.6%
Stomal ulceration	6.66%	20%

However the proportion of patients with these complications is quite higher in case of loop gastrojejunostomy with stricture being found in ~16%, stomal ulceration in~3%, and bleeding~3% , at the end of 6 months.

The Roux stasis syndrome, characterized by abdominal pain, nausea, vomiting, and postprandial bloating, appears in approximately 30% of patients at risk [16,17] .The syndrome results, in part, from the bowel transection required to create the Roux limb. [18,19] The transection disconnects the Roux limb from the duodenal pacemaker. Ectopic pacemakers then appear in the limb between 5 and 40 cm distal to its proximal end. They beat at a slower frequency than the duodenal pacemaker. Also, they drive the pacesetter potentials (PPs), hence contractions, of the proximal portion of the Roux limb in an oral direction, toward the stomach. The slow PP frequency and the oral PP propagation delays gastric emptying and slows Roux limb transit.
On comparing features of roux stasis in our study between two procedures it was seen that bloating seen in the both of the procedures but more common in case of loop gastrojejunostomy(70%) as compared to Roux-en-Y GJ (30%). Regurgitation was seen in 66.66% of loop GJ compared to 40% in Roux-en-Y GJ.

Only 20% cases of Roux-en-Y GJ suffered from vomiting whereas 50% cases of loop GJ have complaint of vomiting in the post-op period.

5. Conclusion

Both Roux-en-Y and loop Gastrojejuno-stomy have been performed since years for patients with gastric outlet obstruction. Since bile and food has the same channel of passage in case of loop Gastrojejuno-stomy and the Roux-en-Y gastrojejunostomy has a different limb for billiary drainage alkaline reflux and other complication are more in loop Gastrojejuno-stomy. Alkaline reflux can lead to both debilitating symptoms and severe gastric and oesophageal mucosal injury. The physiologic alterations leading to pathologic reflux should be thoroughly investigated prior to any attempt at surgical correction.

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