



Evaluation of Short-term Outcome of Uncut Roux-en-Y Gastrojejunostomy for Distal Gastric Cancer in a Tertiary Care Hospital

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Abstract

Background: Gastric cancer is the fifth most common malignancy worldwide and the third leading cause of cancer death. Gastric cancer is one of the most common malignant tumors of the gastrointestinal tract, and it poses a serious threat to people's survival. Objective: The aim of the study to evaluate the short-term outcomes of Uncut Roux-en-Y Gastrojejunostomy for distal gastric cancer. **Material & Methods:** This observational study was conducted in the Department of surgical oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka. A total number of 51 cases were included for the study. Purposive sample technique was used. All patients received prophylactic antibiotic using cefuroxime just before the induction of anaesthesia and continued postoperatively for 5 days. All the data were analyzed statistically by using Statistical Package for the Social Sciences (SPSS-26). **Results:** The mean age of the study subject was 58.58±9.85 years. Majority (42%) of the study subjects were in 51-60 years age group. Among the study cases 37 (74%) were male and 13 (26%) were female. The mean total operation time was 173.70±20.35min. The mean estimated blood loss was 174.30±40.67 ml. The mean time of first flatus pass after operation was 2.08±0.75 days and the mean duration of hospital stay was 9.64±2.67 days. Post-operative complications were observed among 08 (16%) cases. The mean preoperative Hb level of the study subjects was 10.86±0.61 gm/dl and the mean preoperative albumin level of the study subjects was 3.76±0.61 gm/dl. Two patients were lost at final follow up (at 6 months). Among these 48 cases at final follow up poor outcome was observed among 15.69% cases. **Conclusions:** After analyzing the results of present study, it can be concluded that Uncut Roux-en-Y Gastrojejunostomy is a safe and favorable procedure for treatment of distal gastric cancer.

Keywords:- Gastric Cancer, Gastrojejunostomy, Outcome, Tumor.

INTRODUCTION

Gastric cancer is the fifth most common malignancy worldwide and the third leading cause of cancer death.^[1] Gastric cancer is one of the most common malignant tumors of the gastrointestinal tract, and it poses a serious

threat to people's survival.^[2] Epidemiological data show that the number of worldwide new cases of gastric cancer annually has increased to about 951600, ranking fourth among all malignant tumors. Each year, about 723100 patients die of gastric cancer, ranking third in cancer mortality.^[3] The treatment of gastric

cancer depends on several factors, including the size, location and extent of the tumor, the stage of disease, the patient's age and overall health. Surgery is currently the only treatment option for gastric cancer with curative potential. The most effective method for treating gastric cancer is still radical surgical resection, although alternative methods include adjuvant chemotherapy, radiotherapy and molecular targeted therapy.^[4] The three widely applied reconstruction methods after distal gastrectomy are Billroth-I, Billroth-II, and Roux-en-Y anastomosis.^[5] Recent research indicates that Roux-en-Y (RY) reconstruction after distal gastrectomy for gastric cancer is superior to the Billroth methods in terms of the long-term postoperative functional outcomes.^[6] Before this procedure Roux-en-Y reconstruction was performed that causes Roux stasis syndrome and reflux gastritis very commonly. Recent past we adopted this procedure (Uncut Roux-en-Y gastrojejunostomy). But yet the outcome of Uncut Roux-en-Y Gastrojejunostomy and morbidity pattern is often not recorded. To reduce the incidence of these postoperative complications, a modified reconstruction technique was developed, which involved occlusion of the jejunal lumen proximal to the gastrojejunostomy and was based on the Billroth-II technique with Braun anastomosis.^[2] A new method of digestive tract reconstruction called the "uncut Roux-en-Y (U-RY) anastomosis" was proposed in 1988, and it is an improvement of RY anastomosis.^[7] For the "Uncut" part of the procedure, jejunal lumen was occluded 25-45 cm distal to the ligament of Treitz using a single, double row non-cutting linear GI stapler. Approximately 20-30 cm distal to the anastomosis, on the efferent limb,

a "Braun" side to side jejuno-jejunostomy was created with the afferent limb for diverting duodenal fluids. This anastomosis corresponds to a site 10- 20 cm distal to the ligament of Treitz on the proximal jejunum (afferent limb).^[8] So, we are interested to see the outcome of the new technique that may prevents most of the complications of conventional Roux-en-Y gastrojejunostomy. Here, a good number of gastric cancer cases are treated surgically by dedicated surgical oncologists. Thus, there is no outcome related data in this Institute.

OBJECTIVES

General objective

To observe the short-term outcomes of Uncut Roux-en-Y Gastrojejunostomy for distal gastric cancer.

Specific objectives

- To observe the early postoperative complications of surgery for gastric cancer by uncut Roux-en-Y technique.
- To observe the functional outcome of this procedures

MATERIAL AND METHODS

This prospective study was conducted in the Department of surgical oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka. A total number of 51 cases were included for the study according to following inclusion and exclusion criteria. Purposive sampling techniques was used. Preoperative evaluation including basic laboratory tests, serum albumin, hemoglobin level, random blood sugar, serum creatinine,

and chest x-ray posterior anterior view, ultrasonogram of whole abdomen, upper gastrointestinal endoscopy and contrast CT scan of abdomen were done. After proper staging patients were selected for operation. Preoperative preparation including correction of anaemia, hypoproteinemia and standard bowel preparation were given before surgery. All patients received prophylactic antibiotic using cefuroxime just before the induction of anaesthesia and continued postoperatively for 5 (five) days. All the data were analyzed statistically by using Statistical Package for the Social Sciences (SPSS-26).

Inclusion Criteria

All patients who underwent Uncut Roux-en-Y Gastrojejunostomy for surgical treatment of distal gastric cancer.

Exclusion Criteria

Non-resectable gastric cancer.

Patients with recurrent gastric cancer

Patients with distal gastric cancer with distant metastasis.

RESULTS

The mean age of the study subject was 58.58 ± 9.85 years. Majority (42%) of the study subjects were in 51-60 years age group, 34% were in >60 years age group, 22% were in 41-50 years age group and 2% were in 31-40 years age group [Figure 1]. Among the study cases 37 (74%) were male and 13 (26%) were female [Figure 2]. Among the study cases 09 (18%) had ischemic heart diseases, 07 (14%) had DM, 06 (12%) had HTN, 03 (06%) had both DM and HTN, 04 (08%) had cardiovascular diseases

and 21 (42%) had no comorbidities [Table 1]. The mean total operation time was 173.70 ± 20.35 min. Minimum time required for operation was 150 min and maximum time required for operation was 250 min. The mean estimated blood loss was 174.30 ± 40.67 ml. The mean per-operative transfusion of blood was 0.78 ± 0.42 unit and the mean time required to perform uncut component was 25.06 ± 3.37 min [Table 2]. The mean time of first flatus pass after operation was 2.08 ± 0.75 days and the mean duration of post-operative hospital stay was 9.64 ± 2.67 days [Table 3]. Post-operative complications were observed among 08 (16%) cases. Among 50 cases paralytic ileus was observed among 02 (04%) cases, persistent abdominal pain was observed among 02 (04%) cases, Roux Stasis Syndrome was observed among 02 (04%) cases [Table 4]. The mean preoperative Hb level of the study subjects was 10.86 ± 0.61 gm/dl and the mean preoperative albumin level of the study subjects was 3.76 ± 0.61 gm/dl. The mean Hb level of the study subjects at 2nd week of follow up was 12.14 ± 0.96 gm/dl and the mean albumin level of the study subjects at 2nd week follow up was 3.77 ± 0.40 gm/dl. The mean Hb level of the study subjects 3rd month follow up was 12.07 ± 1.33 gm/dl and the mean albumin level of the study subjects at 3rd month of follow up was 3.91 ± 0.30 gm/dl. The mean Hb level of the study subjects at 6th month follow up was 12.98 ± 0.80 gm/dl and the mean albumin level of the study subjects at 6th month follow up was 4.17 ± 0.33 gm/dl [Table 5]. Two patients were lost at final follow up (at 6 months). Among these 48 cases at final follow up poor outcome was observed among 19.58% cases. The overall mortality rate was 6.25%. Bile reflux with reflux gastritis was observed in

01(2.08%) cases, bile reflux without reflux gastritis was observed in 01(2.08%) cases and recanalization occurred in 1(2.08%) cases. Roux

stasis syndrome was developed in 02(4.17%) cases [Table 6].

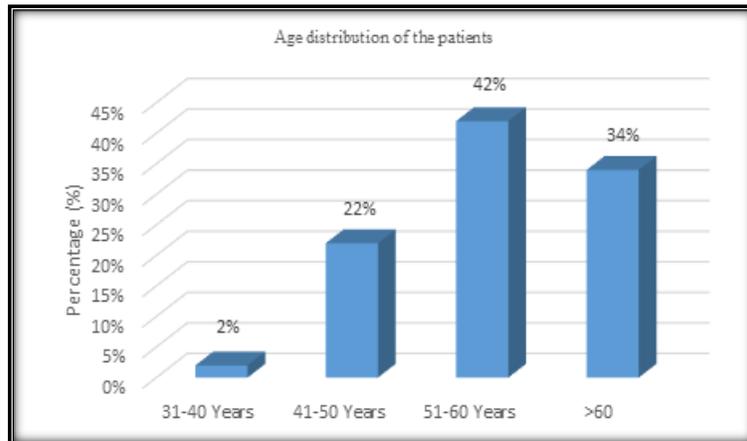


Figure 1: Age distribution of the patients (N=51).

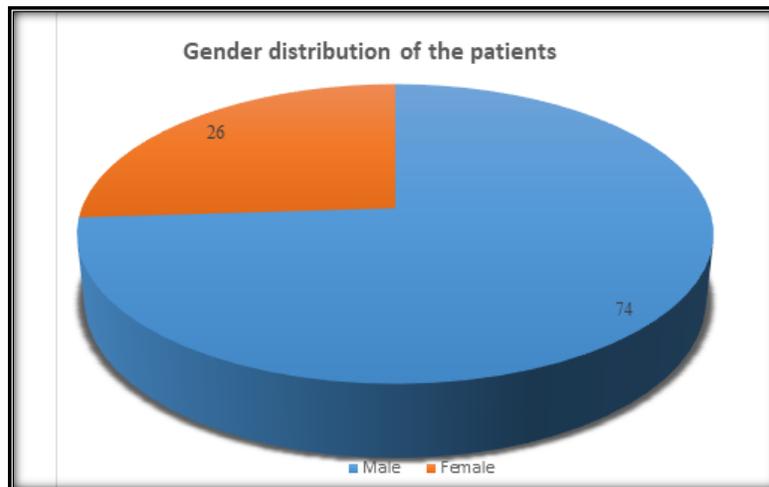


Figure 2: Gender distribution of the patients (N=51).

Table 1: Co-morbidities status of the patients (n=51)

Co-morbidities present among the patients	n=51	%
Diabetes mellitus	7	14
Hypertension	6	12
Diabetes mellitus and hypertension	3	6
Ischemic heart diseases	9	18
Cardiovascular diseases	4	8
No comorbidities	21	42

Table 2: Different per-operative parameters of the patients (n=51)

Variable	Range (minimum-maximum)	Mean ±SD
Total operation time (min)	150-250	173.7±20.35
Estimated blood loss (ml)	80-250	174.30±40.67
Per-operative transfusion of blood (Unit)	0-1	0.78±0.42
Time required of perform Uncut component (min)	20-30	25.06±3.37

Table 3: Mean time of passing flatus and duration of hospital stay of the patients (n=50).

Variable	Range (minimum-maximum)	Mean ±SD
Time to pass flatus (Days)	01-04	2.08±0.75
Duration of post-operative hospital stay (Days)	07-15	9.64±2.67

Table 4: Postoperative complications of the patients (N=50)

Post-operative complications	n=51	%
Paralytic ileus	2	4
Persistent abdominal pain	2	4
Roux Stasis syndrome (RSS)	2	4
Superficial wound infection	2	4
Uneventful	42	84

Table 5: Mean Hb and albumin level of the study subjects (N=50)

Variable	Preoperative (N=50)	At 2nd week of follow up (N=50)	At 3rd month of follow up (N=44)	At 6th month of follow up (N=32)
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Hemoglobin (gm/dl)	10.86±0.61	12.14±0.96	12.07±1.33	12.98±0.08
Albumin (gm/dl)	3.76±0.61	3.77±0.40	3.91±0.30	4.17±0.33

Table 6: Functional outcome of the patients based on endoscopic findings at final follow up (at 6th month) (N=48)

Complications	n=50	%
Bile reflux with reflux gastritis	1	2.08
Bile reflux without reflux gastritis	1	2.08
Recanalization	1	2.08
Roux stasis syndrome	2	4.17
Died	3	6.25
Uneventful	43	84.31

DISCUSSION

In this study, mean± SD age of the subjects was 58.58±9.85 years. The youngest and the oldest

patients were 31 and 80 years respectively. Rahman et al,^[8] showed mean age was 51.2±10.12 years and youngest and the oldest patients were 35 to 66 years. Park and Kim,^[9]

showed mean age was 57.6 ± 11.9 years. Only 14% had history of DM, 12% HTN, 8% had both DM and HTN 10% had CVD and 18 % had history of IHD. Among the study subjects, majority of cases was in T2 and NO stage according to T and N stage. No metastasis occurs in study subjects. This finding was similar with study done previously.^[10] In present study, mean \pm SD surgical time for the patients was 173.70 ± 20.35 minutes and similar findings are observed by Zhang et al,^[11] 175 ± 30 minutes,^[12] 178 minutes and,^[13] 154.8 ± 17.8 minutes. Rahman et al,^[8] performed a study of 47 patients and average time taken to perform the “Modified Uncut Roux-en-Y” component of the procedure was 24 ± 4.7 minutes (Mean \pm SD) and in our study it was 25.06 ± 3.37 minutes, which is similar. Estimated blood loss was 174.30 ± 40.67 ml. Almost similar findings were observed by Shibata et al.^[14] In present study, mean time of 1st flatus pass after operation was 2.08 ± 0.75 days. Similar findings were observed by Zhang et al,^[11] 2 days (range 1-3 days), kim et al,^[6] 2.8 ± 0.8 days. Only 2 (4%) of the subjects were developed wound infection, 2 (4%). 2 (4.17%) cases developed RSS. Similar results observed by Park et al,^[9] 5.8% and Rahman et al,^[8] 4.3%. Mean length of post-operative hospital stay was 9.64 ± 2.67 days, similar results observed by Shibata et al,^[14] 9 days, Zhang et al,^[11] 8 (range 7-12) days, Rahman et al,^[8] 9.3 ± 3.4 days. In present study, nutritional status was significantly improved after surgery which was assessed by estimating hemoglobin and serum albumin level. Similar findings were observed by Rahman et al.^[8] Sun et al,^[15] found no differences with respect to nutritional status in uncut Roux-en-Y and Roux-en-Y reconstruction. At 6th month follow up, Bile reflux with reflux gastritis was

observed in 02 (4.17 %) cases, bile reflux without reflux gastritis was observed in 01 (2.08 %) cases and no gastritis occurred according to Rahman et al,^[8] and Shibata et al^[14] but higher rate observed by Park et al,^[9] 23.7% and Yang D et al,^[13] 55.1% reported that no serious postoperative morbidities related to the anastomosis were noted. Zhang et al,^[11] did not observe any cases of long-term postoperative complication (30 days after surgery), recurrence, nor any cancer related mortality death occurs in 6 cases, among them 2 (12.5%) died from complications of chemotherapy, 03 (18.75%) due to cardiovascular disease, 01 (6.25 %) due to immediate post-operative complications.

Limitations

This was single center study. So, the study population might not represent the whole community. No comparative study between Uncut Roux-en-Y and Roux-en-Y reconstruction. The study follow-up period were short in comparison to other studies.

CONCLUSIONS

In evaluation of the short-term outcomes following Uncut Roux-en-Y Gastrojejunostomy for distal gastric cancer we found that few patients developed Roux Stasis syndrome (4.16 %), developed bile reflux and recanalization 2(4.17%) and post-operative nutritional status improved after Uncut Roux-en-Y Gastrojejunostomy.

Recommendations

We recommend further study on a bigger sample size from multiple centers considering all clinico-pathological and operative factors.

Similar type of study could be done to observed long term survival outcome and quality of life. A comparative study could be

done. Modified Uncut Roux-en-Y reconstruction can prevent recanalization and reflux gastritis.

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