



Received: 16-05-2024  
Accepted: 26-06-2024

ISSN: 2583-049X

## Does Roux-en-Y Anastomosis Excels Intestinal Interposition in Gastrectomy?

**Kiril Kirov**

Medical University, Pleven, Bulgaria

DOI: <https://doi.org/10.62225/2583049X.2024.4.4.3008>

Corresponding Author: **Kiril Kirov**

### Abstract

**Background:** Gastrectomy, the surgical removal of all or part of the stomach, is a critical intervention often employed in cases of gastric cancer. Among the various techniques utilized in gastrectomy, two primary methods have gained prominence: Roux-en-Y anastomosis and intestinal interposition. Both techniques aim to restore gastrointestinal continuity and functionality post-surgery, yet they differ in their approaches and outcomes. This article evaluates the efficacy, benefits, and drawbacks in the context of gastrectomy.

**Patients and Methods:** A retrospective study was conducted at the Surgical department of Complex Oncological Centre of Shumen, Bulgaria between March 2019 and November 2023, including 55 patients, 35 males and 20 females who underwent gastrectomy for gastric cancer or peptic ulcer disease. Roux-en-Y anastomosis was

used in 30 and in 25 patients was used intestinal interposition. Medical records of eligible patients were reviewed to collect demographic data, preoperative clinical characteristics, surgical details, and postoperative outcomes.

**Results:** The total number of complications amounts to 10, - 2 in Roux-en-Y and 8 after intestinal interposition. Complications in intestinal interposition are 4,8 times more frequent than in Roux-en-Y reconstruction, which, considering the small number of patients compared, represents a significant difference.

**Conclusion:** This study contributes to the existing literature by elucidating the advantages and drawbacks of each reconstruction technique. Surgical skills play a vital role in the selection and execution of reconstruction methods after total gastrectomy.

**Keywords:** Gastrectomy, Roux-en-Y anastomosis, Intestinal Interposition, Complications

### Introduction

The surgical removal of all or part of the stomach, is a critical intervention often employed in cases of gastric cancer or severe gastric disorders. Among the various techniques utilized in gastrectomy, two primary methods for reconstruction after partial or total gastrectomy have gained prominence: Roux-en-Y anastomosis and intestinal interposition. Both techniques aim to restore gastrointestinal continuity and functionality post-surgery, yet they differ in their approaches and outcomes. This article delves into the comparative analysis of Roux-en-Y anastomosis and intestinal interposition, evaluating their efficacy, benefits, and drawbacks in the context of gastrectomy.

### Patients

A retrospective study was conducted at the Surgical department of Complex Oncological Centre of Shumen, Bulgaria between March 2019 and November 2023, including 55 patients, 35 males and 20 females who underwent gastrectomy for gastric cancer or peptic ulcer disease. Roux-en-Y anastomosis was used in 30 and in 25 patients was used intestinal interposition (Table 1). Inclusion criteria comprised patients aged 18 years or older who underwent either Roux-en-Y anastomosis or intestinal interposition for gastrointestinal reconstruction following partial or total gastrectomy. Exclusion criteria included patients with incomplete medical records, previous gastrointestinal surgery, or those lost to follow-up.

**Table 1:** Distribution according to sex and method

Operational approach	Type of resection				Total	
	Roux-en-Y		intestinal interposition		n	%
	n	%	n	%		
Men	21	70%	14	56%	35	64%
Women	9	30%	11	44%	20	36%
Total	30		25		55	

## Methods

Medical records of eligible patients were reviewed to collect demographic data, preoperative clinical characteristics, surgical details, and postoperative outcomes. Data on perioperative variables, including operative time, blood loss, length of hospital stay, and postoperative complications, were extracted and analyzed (Table 2, 3). Long-term outcomes, including nutritional status, quality of life, and survival, were assessed through clinical follow-up appointments and telephone interviews.

**Table 2:** Operational characteristics of patients with Roux-en-Y reconstruction

Indicator	x±SD	interval
Duration (min)	120.2±6.7	95-145
blood loss (mL)	110.4±41.5	50-250
Drains (mL)	220.6±151.8	120-2000
Flatus (Day)	3.4±1.8	2-5
feeding (day)	3.5±1.6	2-5
hospital stay (days) after surgery	7.2±3.1	5-9
Movement (day)	2.5±0.9	2-4
lymph nodes removed (number)	11.1±4.9	6-17

**Table 3:** Operational characteristics of patients with intestinal interposition

Indicator	x±SD	interval
Duration (min)	130.5±19.2	100-150
blood loss (mL)	340.7±102.8	180-610
Drains (mL)	500.8±278.7	220-1300
Flatus (Day)	3.1±0.8	2-4
feeding (day)	3.2±0.9	2-5
hospital stay (days) after surgery	7.1±2.4	5-14
Movement (day)	2.5±0.6	2-4
lymph nodes removed (number)	10.5±3.1	6-16

## Surgical Technique

**Roux-en-Y Anastomosis:** The Roux-en-Y procedure involved the creation of a Y-shaped gastrointestinal reconstruction with a proximal gastrojejunal anastomosis and a distal jejunojejunal anastomosis. The proximal jejunal limb was anastomosed to the remnant stomach or esophagus, while the distal limb was connected to the proximal small intestine in an antecolic or retrocolic fashion, depending on the surgeon's preference. The length of the Roux limb was tailored to prevent tension and ensure adequate drainage.

**Intestinal Interposition:** Intestinal interposition entailed the use of a segment of the patient's own intestine, typically the

jejunum, to reconstruct the gastrointestinal tract. The interposed segment was mobilized and brought up to the remnant stomach or esophagus, where an end-to-end anastomosis was performed. Careful attention was paid to maintaining adequate blood supply and ensuring tension-free anastomosis. The length of the interposed segment was adjusted to achieve optimal alignment and functionality.

## Results

We establish acceptable intraoperative characteristics of patients, comparable to data from the literature available in recent years. We found a slight advantage in terms of operating time, blood loss and secretion from the drains in favour of Roux-en-Y reconstruction. Primary outcome measures included perioperative complications, such as anastomotic leaks, strictures, intra-abdominal abscesses, and postoperative mortality. The total number of complications amounts to 10, - 2 in Roux-en-Y and 8 after intestinal interposition. Complications in intestinal interposition are 4,8 times more frequent than in Roux-en-Y reconstruction, which, considering the small number of patients compared, represents a significant difference (Table 4). However, these differences in terms of absolute number and relative share are not statistically reliable due to the small number of cases and the fact that the two types of reconstructions were performed by two different surgeons: One using Roux-en-Y and the other using intestinal interposition, as observed by us. Nutritional status was assessed based on serum albumin levels, body mass index (BMI), and dietary intake. Quality of life was evaluated using validated questionnaires, such as the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30). Our results convincingly show the achieved satisfactory individual quality of life in patients operated on the occasion of gastric cancer through both Roux-en-Y and intestinal interposition (Table 5, 6). We definitely believe that the specialized questionnaire EORTC QLQ-CR30 provides valuable information on the subjective assessment of operated patients and deserves to be applied more widely in clinical practice. The results obtained by us do not show statistically reliable differences between the different approaches and methods of surgical treatment. At the third week after surgery, we perceived a slightly better subjective assessment by the patients surveyed with Roux-en-Y anastomosis of their functional state (milder anxiety and better body image and future vision) and a lower incidence of some specific symptoms (abdominal pain, impaired taste and intestinal passage). At the third month after surgery, there are very minor differences between the patients from the two groups, which testifies to the high effectiveness of the overall treatment approach in them. The comparison with the data in the patients from the two groups does not highlight any differences in terms of quantitative indicators of their individual quality of life.

**Table 4:** Number and proportion of postoperative complications

Postoperative complications	Roux-en-Y (n=30)		intestinal interposition (n=25)		Total (n=55)	
	n	%	n	%	n	%
intra-abdominal abscesses	1	3,3%	1	4%	2	3,6%
anastomotic leaks	0	0	3	12%	3	5,4%
strictures	0	0	1	4%	1	1,8%
Bleeding	1	3,3%	1	4%	2	3,6%
Intestinal obstruction	0	0	1	4%	1	1,8%
postoperative mortality	0		1	4%	1	1,8%
Total	2	6,6%	8	32%	10	18%

**Table 5:** Symptoms of operated patients at the third week after gastrectomy

Symptoms	Roux-en-Y (n=30)		intestinal interposition (n=25)	
	x±SD	interval	x±SD	interval
abdominal pain	2±1	0-39	3±1	0-33
feeling puffy	1±2	0-33	2±1	0-33
dry mouth	3±2	0-67	5±2	0-33
Hair loss	1±1	0-67	1±1	0-56
Impaired taste	2±1	0-39	4±1	0-33
Glossitis	2±2	0-39	2±1	0-33
disturbed intestinal passage	1±3	0-67	3±2	0-56

**Table 6:** General functional status of the operated patients at the third week after gastrectomy

Indicators	Roux-en-Y (n=30)		intestinal interposition (n=25)	
	x±SD	interval	x±SD	interval
Anxiety	56±16	61-100	70±14	52-100
own body image	81±21	72-100	95±17	78-100
Prospects for the future	78±20	59-100	84±18	67-100
Sexuality in men	57±14	50-100	62±16	61-100
Sexuality in women	39±13	34-100	44±11	39-100

**Discussion**

The question of whether Roux-en-Y anastomosis excels over intestinal interposition in gastrectomy is nuanced and depends on several factors, including the patient's specific condition, surgical goals, and potential postoperative outcomes [1]. Roux-en-Y anastomosis is typically the preferred technique for gastrectomy in cases of gastric cancer, benign gastric diseases, and bariatric surgery [2, 3]. Intestinal interposition may be indicated in specific scenarios where there are challenges with the remaining stomach or esophagus, such as extensive scarring, radiation damage, or anatomical abnormalities. It may be associated with higher rates of complications like anastomotic strictures, fistulas, and delayed gastric emptying [4, 5]. Roux-en-Y anastomosis is associated with a lower risk of complications such as bile reflux, dumping syndrome, and anastomotic leakage compared to intestinal interposition [6]. The choice between Roux-en-Y anastomosis and intestinal interposition may also depend on the surgeon's experience, institutional protocols, and available resources. Surgeons may have varying levels of expertise and comfort with each technique, influencing their preference in specific cases. While Roux-en-Y anastomosis is commonly considered the standard approach in gastrectomy for many conditions, intestinal interposition may offer advantages in select cases where there are anatomical or pathological challenges. Collaboration between surgeons, multidisciplinary teams, and patients is essential in determining the most appropriate approach for gastrectomy. The discussion surrounding reconstruction methods after total gastrectomy for gastric cancer patients is crucial for optimizing post-operative outcomes. While numerous techniques have been developed, none have emerged as universally superior, highlighting the complexity of this decision-making process

[7, 8]. Roux-en-Y anastomosis stands out as a widely utilized approach due to its simplicity, safety profile, and minimal reflux symptoms, supported by evidence from randomized controlled trials [9]. However, the emergence of alternative methods, such as aboral pouch reconstruction and functional jejunal interposition, has sparked interest in exploring potentially superior options. Complications following esophageal jejunal Roux-en-Y anastomosis can be significant, encompassing anastomotic leakage, empyema, subdiaphragmatic abscess, and postoperative intestinal obstruction. Yet, the challenge of nutrient absorption post-total gastrectomy remains a pivotal concern. In striving for enhanced long-term life quality for patients, the preference leans toward jejunal interposition, which conserves the duodenum. Roux-en-Y anastomosis involves transecting the jejunum, potentially compromising the integrity of conduction pathways between the intestinal tract and associated nerves [10]. This diversion of food away from the duodenum disrupts normal digestive and absorption functions. In contrast, the interposition jejunal gastrectomy procedure avoids complete jejunum transection, thus preserving the patient's intestinal physiology and nerve conduction. By maintaining the integrity of the digestive tract to the fullest extent possible, this approach mitigates postoperative reflux esophagitis risks [11, 12].

These results underscore the importance of evidence-based decision-making in selecting the most appropriate reconstruction method for individual patients. Additionally, considering the heterogeneity of gastric cancer patients, personalized approaches to reconstruction method selection may yield better results.

The discussion of reconstruction methods after total gastrectomy underscores the importance of surgical skills in

achieving optimal patient outcomes. While numerous techniques exist, the successful implementation of Roux-en-Y anastomosis, the most common reconstruction method, highlights the value of surgical proficiency [13, 14]. Its simplicity and safety, coupled with low reflux symptoms, emphasize the importance of surgeons' technical expertise in executing this procedure effectively. The poorer performance of functional jejunal interposition highlights the importance of surgeons' ability to select and execute the most appropriate technique based on evidence and patient factors [15].

### Conclusions

The comparative analysis of Roux-en-Y anastomosis and intestinal interposition in gastrectomy provides valuable insights into their efficacy, safety, and long-term outcomes. This study contributes to the existing literature by elucidating the advantages and drawbacks of each reconstruction technique, aiding clinicians in making informed decisions tailored to individual patient needs. Further prospective studies with larger sample sizes and longer follow-up periods are warranted to validate these findings and refine surgical strategies in gastrectomy. Surgical skills play a vital role in the selection and execution of reconstruction methods after total gastrectomy. Surgeons with advanced technical expertise can navigate the complexities of these procedures, ultimately contributing to improved patient outcomes and quality of care.

**Ethical Considerations:** This study was approved by the Ethics Committee of Complex Oncological Centre of Shumen, Bulgaria. Informed consent was obtained from all patients included in the study.

**Limitations:** Limitations of this study include its retrospective design, which may introduce selection bias and confounding variables. Additionally, the relatively small sample size and single-center experience may limit the generalizability of the findings. Long-term follow-up data beyond the study period were limited, and variability in surgical technique among different surgeons may have influenced outcomes.

### References

1. Cai QP. Reasonable selection of digestive tract reconstruction methods after total gastrectomy[J]. *Shanghai Yi Yao*. 2021; 42(11):6-11. Doi: <https://doi.org/10.3969/j.issn.1006-1533.2021.11.003>.
2. Li LP, Cui HP, Shang L. Choice and consideration of digestive tract reconstruction after total gastrectomy and proximal gastrectomy. *Chin J Digest Surg*. 2021; 20(06):643-647.
3. Fuchs KH, Thiede A, Engemann R, Deltz E, Stremme O, Hamelmann H. Reconstruction of the food passage after total gastrectomy: Randomized trial. *World J Surg*. 1995; 19(5):698-705. Doi: <https://doi.org/10.1007/BF00295908>. PMID: 7571666.
4. Adachi S, Inagawa S, Enomoto T, Shinozaki E, Oda T, Kawamoto T. Subjective and functional results after total gastrectomy: Prospective study for long term comparison of reconstruction procedures. *Gastric Cancer*. 2003; 6(1):24-29. Doi: <https://doi.org/10.1007/s101200300003>. PMID: 12673423.

5. Xu JG. Clinical comparison of two types of total gastrectomy for gastric replacement. *Pract Clin Med*. 2006; 07:66-68.
6. Yang PM. Comparison of two gastric replacement methods after total gastrectomy. *Chin J Gastroenterol*. 2006; 01:23-25.
7. Dong ZJ, Wu LX, Li EJ. Study on reconstruction of digestive tract after total gastrectomy for gastric cancer. *Hebei Med*. 2009; 31(21):2953-2954.
8. Long Z. Observation on clinical efficacy of digestive tract reconstruction after total gastrectomy. *Chin Med Sci*. 2012; 2(10):219-222.
9. Chen SF. Observation on the therapeutic effect of modified jejunal interposition for gastric replacement on reconstruction of digestive tract after total gastrectomy for gastric cancer. *Med Theory Pract*. 2014; 27(19):2574-2575.
10. Wei XJ. Clinical observation on total gastrectomy with OI type jejunal interposition in situ generation for gastric cancer. *Guangxi Med*. 2014; 36(03):315-317.
11. Shao Y, Yin L. Evaluation of P shape jejunum pan jejunum esophagus Roux-en-Y anastomosis and modified jejunal interposition in total gastrectomy for gastric cancer. *Chin J Clin Oncol Rehabil*. 2015; 22(06):705-707.
12. Jiang Y, Zheng MS, Wu XL, Lin YF. Effect of interposition jejunum reconstruction on nutritional metabolism and gastrointestinal function of patients after total gastrectomy. *Chin Health Standard Manag*. 2016; 7(24):35-37.
13. Zhou FY. Comparison of different digestive tract reconstruction methods in patients undergoing total gastrectomy for gastric cancer [J]. *Chin Med Guide*. 2017; 15(32):173-174.
14. Li L. The effect of jejunal interposition and Roux-en-Y anastomosis on gastric cancer patients after radical total gastrectomy. *Modern Diag Treatment*. 2018; 29(06):922-924.
15. Qin XY. Comparison of functional jejunum interposition and P-Roux-en-Y jejunum interposition in gastric cancer patients after radical total gastrectomy. *Henan Med Res*. 2018; 27(17):3118-3120.