



Comparative Evaluation of the Results of Surgical Treatment of Complicated Giant Pyloroduodenal Ulcers

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Abstract

The results of various organ-preserving operations and resection methods of treatment of 130 patients with complicated giant pyloroduodenal ulcers operated at the City clinical hospital named after S. S. Yudin from 2000 to 2019 were analyzed. Among the patients there were 98 (75.4%) men and 32 (24.6%) women aged 20 to 86 years. The median age was 49.3 years for men and 59.4 years for women. All 130 patients had a combination of two or more complications of peptic ulcer disease. In all cases, there was duodenal stenosis or gastric outlet, mostly compensated or sub compensated. In 9 more patients (6.9%), along with stenosis of the exit section of the stomach, perforation of the anterior wall ulcer in combination with bleeding from the posterior wall ulcer was noted. Penetration into neighboring organs or structures was observed in 73 (56.1%) patients. Hemipylorotomy with transverse pyloroplasty was performed in 34 patients with perforating, 25 patients with bleeding giant pyloroduodenal ulcers. Gastroduodenostomy for Finney was performed in 31 patients. In 26 patients, the operation was combined with combined vagotomy and in 5 patients - with bilateral stem vagotomy. Gastric resection was performed in 22 patients: 13 with perforating ulcers and 9 with bleeding giant pyloroduodenal ulcers. In 19 cases, resections were performed in the volume of two-thirds of the stomach and in 3 cases-pylorobulbar resection. Complications in the early postoperative period were observed in 36 of 130 patients (27.7%), 14 patients died (10.7%). Violation of evacuation from the stomach in the early postoperative period was observed in 51 of 130 patients (39.2%). There were no fatalities among patients who underwent organ-preserving operations with vagotomy.

Keywords: Surgical Treatment; Giant Pyloroduodenal Ulcers; Disease; Ulcers; Combined Complications of Peptic Ulcers, Finney's Operation, Hemipylorotomy, Gastric Resection

Introduction

The development and introduction into clinical practice of new anti-ulcer drugs did not lead to a significant reduction in the frequency of complications of peptic ulcer disease and associated mortality [1-3]. Mortality is especially high in patients with giant ulcers of the stomach and duodenum. Giant ulcers are considered to be those whose crater size is more than 20 mm for the pyloroduodenal region, and more than 30 mm for ulcers localized in the stomach [4,5]. The predominant localization of giant ulcers is the pylorus and duodenal bulb area [6]. The interest in giant ulcers is explained by the fact that the treatment of patients with such ulcers is still a serious problem in surgical gastroenterology. According to recent studies, the number of patients with giant ulcers is 40.8% among all those hospitalized in surgical hospitals for complications of peptic ulcer disease [7].

Relevance

Publications devoted to the surgical treatment of complicated giant pyloroduodenal ulcers are few and demonstrate the lack of a unified point of view regarding the nature and scope of the operation. When perforating giant ulcers, preference is still given to suturing the perforating hole, often atypical, using a large omentum [8,9], which is associated with a significant number of complications in the early postoperative period, as well as relapse of the disease and a high probability of repeated complications. These circumstances are inevitably associated with a significant increase in the duration of hospitalization, disability after discharge from the hospital, and are also the cause of repeated hospitalizations.

Recommended by a number of authors as a radical operation, gastric resection in perforated and bleeding giant pyloroduodenal ulcers is accompanied by significant mortality, reaching 12% in perforation and 17% in bleeding [10]. Organ-preserving operations with vagotomy in giant pyloroduodenal ulcers, as evidenced by literature data, are rarely performed. Nevertheless, their authors report lower postoperative mortality and better functional results in the long term after surgery [2,3,6,12-14].

The effectiveness of any operation is determined based on the study of its results at various times after its completion. There are few works devoted to the comparative evaluation of various surgical interventions for complicated giant pyloroduodenal ulcers [11]. The few available studies relate mainly to the results of one of the methods of surgical interventions performed in patients with giant pyloroduodenal ulcers [8,9,15,16].

Our study is devoted to the study of the immediate and long-term results of various surgical interventions both with and without vagotomy, as well as gastric resection in patients with complicated giant pyloroduodenal ulcers.

Materials and Methods

The results of various organ-preserving operations and resection methods of treatment of 130 patients with complicated giant pyloroduodenal ulcers operated at the city clinical hospital named after S. S. Yudin in Moscow from 2000 to 2019 are analyzed.

Among the patients there were 98 (75.4%) men and 32 (24.6%) women aged 20 to 86 years. The average age of men was 49.3 years, women - 59.4 years. Ulcerative anamnesis was collected in 99 patients (76.3%), the rest had a low-symptomatic or asymptomatic course of the disease. Complications of peptic ulcer disease in the anamnesis were noted in 33 patients (25.4%). Bleeding was previously observed in 20 (15.4%) patients, in 6 of them-repeated. Regarding the perforation of the ulcer, 13 patients were operated on earlier, they were sutured with a perforated hole.

71 patients were operated on for perforation of giant pyloroduodenal ulcers, 59 patients were operated on for ulcerative bleeding. Serous peritonitis was found in 21 (29.5%) patients, fibrinous in 36 (50.7%) patients, and 14 patients (19.7%) had fibrinous-purulent peritonitis. According to the prevalence, diffuse peritonitis was observed in all operated patients who underwent organ-preserving operations with vagotomy, local or diffuse peritonitis was observed in patients who underwent gastric resection. All patients who underwent palliative interventions had fibrinous-purulent peritonitis.

Based on the study of a set of clinical and laboratory data, such as the general condition of patients, hemodynamic parameters, laboratory data, mild blood loss was noted in 18 (30.5%) patients, moderate severity-in 28 (47.4%) patients, and 13 (22.1%) patients were hospitalized with severe blood loss.

All 130 patients had a combination of two or more complications of peptic ulcer disease. In all cases, there was duodenal stenosis or gastric outlet, mostly compensated or sub-compensated. In another 9 patients (6.9%), along with stenosis of the exit part of the stomach, perforation of the anterior wall ulcer in combination with bleeding from the posterior wall ulcer was noted. Penetration into neighboring organs or structures was observed in 73 (56.1%) patients.

Taking into account the nature of the performed surgical interventions, all patients were divided into 4 groups. The first group included 59 patients who underwent transverse pyloroplasty in combination with combined vagotomy after excision of a perforated or bleeding giant ulcer of the anterior wall of the pylorus.

The second group consisted of 31 patients with localization of a giant ulcer in the duodenal bulb, who underwent gastroduodenostomy according to Finney in combination with combined vagotomy.

The third group included 22 patients who underwent pylorus and duodenal bulb resection or resection of 2/3 of the stomach with a circular giant ulcer with gastroduodenoanastomosis. And the fourth group included 14 patients who underwent palliative interventions: suturing of a perforated ulcer or stitching of bleeding vessels in an ulcer with pyloric or duodenoplasty.

Study

Hemipylorotomy with transverse pyloroplasty was performed in 34 patients with perforating in 25 patients with bleeding giant pyloroduodenal ulcers. The indication for its implementation was the localization of a perforated or bleeding ulcer in the pyloric canal. The most important fragment of the operation with the gigantic size of a perforated or bleeding ulcer of the pyloroduodenal region is its excision together with the anterior semicircle of the pylorus within healthy tissues, because the preservation (even partial) of the posterior semicircle of the pyloric pulp further provides a closure function close to normal. In this variant of pyloroplasty, there is no need to mobilize the duodenum according to Kocher, since after thorough enterolysis in the pylorus area, tension along the suture line usually does not occur [11]. Therefore, transverse pyloroplasty is less traumatic, less time-consuming and more physiological intervention compared to other drainage operations, which is very important in urgent surgery.

Gastroduodenostomy according to Finney [17] was performed in 31 patients. In 26 patients, the operation was combined with combined vagotomy and in 5 patients - with bilateral stem vagotomy. The indication for surgery in 20 cases was ulcerative bleeding, and in 11 cases-perforation of the ulcer. The reason for performing a gastroduodenostomy according to Finney was the localization of a perforated or bleeding giant ulcer in the duodenal bulb, when the crater of the giant ulcer was at a distance of more than 1 cm from the gatekeeper and performing less traumatic transverse pyloro-

plasty became impossible. Thanks to a wide gastroduodenostomy, Finney's operation allows you to excise a perforated or bleeding ulcer of the anterior or antero-lateral wall of the duodenum within unchanged tissues, perform a full-fledged revision of the posterior wall for the presence of a combined ulcer, and creates the most favorable conditions for manipulations on a bleeding ulcer of the posterior wall. The mobilization of the duodenum by Kocher always allows the formation of a reliable gastro-duodenal junction within healthy tissues due to the mobilized duodenum and mobile gastric wall.

Stomach resection was performed in 22 patients: 13 with perforating and 9 with bleeding giant pyloroduodenal ulcers. In 19 cases, resections were performed in the volume of two-thirds of the stomach and in 3 cases - resection of the pylorus and duodenal bulb. Gastro-enteroanastomosis was formed according to both Billroth-I and Billroth-II in various modifications. Gastric resection was performed in cases when, during mobilization in the area of the ulcer, the duodenum "breaks", since the abandonment of the ulcerative substrate leads to both early and late postoperative complications. Of the 19 resections in the volume of 2/3 of the stomach, 16 patients underwent resection according to Billroth-II method in the following modifications: according to Balfour with inter-intestinal anastomosis - 7, according to Hofmeister-Finsterer- 4, and according to Ru- 5 resections. According to Billroth-I method, resection was performed in 3 patients. These gastric resections were performed without vagotomy.

Pylorus and duodenal bulb resection was performed in 3 patients; gastro-enteroanastomosis was always formed according to Billroth-I. In all cases, the operation is supplemented by a bilateral stem vagotomy. This type of resection was performed as a forced operation for giant circular pyloroduodenal ulcers, as well as in cases when the surgeon clearly imagined that after excision of a large ulcerative defect in the intestinal wall, plastic surgery would become impossible.

Palliative surgical interventions were performed in 18 patients, 8 of them for ulcer perforation, and 10 for ulcerative bleeding. Palliative operations were performed in patients with widespread fibrinous-purulent peritonitis or severe blood loss, as well as in patients with aggravating concomitant diseases. In case of perforation of the ulcer, suturing of the perforating hole was performed, in 3 cases - omental patch-reinforced suturing. In patients with ul-

cerative bleeding from giant pyloroduodenal ulcers, palliative surgery consisted of longitudinal pyloroduodenotomy and stitching of bleeding vessels in the bottom of the ulcerative crater, followed by suturing of the pyloroduodenotomic opening in the transverse direction.

Complications in the early postoperative period were observed in 36 of 130 patients (27.7%), 14 patients (10.7%) died.

The greatest number of unsatisfactory results of surgical treatment was observed in patients who had to undergo palliative surgery or gastric resection (Table 1).

Complications	Hemipylorectomy with transverse pyloroplasty (n = 59)	Finney's operation (n = 31) Gastric resection (n = 22) Palliative surgery (n = 18)	Gastric resection (n = 22)	Palliative surgery (n = 18)
Postoperative wound seroma	5 (8,5%)	-	3 (13,6%)	-
Suppuration of a postoperative wound	-	3 (9,7%)	-	-
Eventration of the gland strand	-	-	2 (9%)	-
Recurrence of bleeding from an ulcer	3 (5,1%)	-	-	1 (5,5%)
Failure of seams	2 (3,4%)	-	2 (9%)	-
Hospital pneumonia	3 (5,1%)	1 (3,2%)	2 (9%)	-
Myocardial infarction	-	-	1 (4,5%)	1 (5,5%)
TELA	-	-	2 (9%)	-
Acute cardiovascular disorders	-	-	2 (9,1%)	3 (16,6%)
Intraoperative mortality	-	-	-	2 (11,1%)
Postoperative mortality	2 (3,4%)	-	5 (22,7%)	7 (38,8%)

Table 1: Complications of surgical treatment in the postoperative period.

Thus, out of 18 patients who underwent palliative surgery, 7 (38.8%) died. Of these, 3 were operated on for perforation of giant ulcers, they died on the 2nd and 4th days after surgery from increasing multiple organ failure (16.6%). The remaining 4 patients were operated on for a bleeding giant pyloroduodenal ulcer. Of these, two elderly patients with active prolonged bleeding were operated urgently. In one patient, a giant ulcer penetrated into the liver. A pyloroduodenotomy was performed, stitching of bleeding vessels in the ulcer, however, it was not possible to stop the bleeding-patients died during surgery from massive blood loss (11.1%). Another patient was urgently operated on again on the 5th day due to a recurrence of bleeding from a stitched ulcer. Death also occurred during surgery from massive blood loss. The cause of death of another patient was acute myocardial infarction, which developed on the 2nd day after the operation, performed in an emergency due to massive ulcerative bleeding.

After palliative operations for bleeding giant pyloroduodenal ulcers, three patients were re-hospitalized during the first few months due to a recurrence of bleeding from the ulcer. When they were hospitalized again, they underwent conservative treatment.

Of the 22 patients who underwent gastric resection, complications in the early postoperative period were observed in 12 (54.5%). Violation of the evacuation function of the stomach stump due to anastomosis was noted in 8 (36.4%) patients. Seroma of a postoperative wound developed in 3 patients (13.6%), eventration of a strand of the large omentum in 2 (9.09%), nosocomial pneumonia in 2 (9.09%), failure of anastomosis sutures with the formation of an intraperitoneal abscess in 1 patient after gastric resection according to the Chamberlain-Finsterer and failure of the duodenal stump after resection according to the Ru in a patient with a giant circular duodenal ulcer. 5 patients died after surgery, the mortality rate after gastric resection was 22.7%. The causes of

death were myocardial infarction in 1 patient, pulmonary embolism in 2 patients operated on for bleeding giant pyloroduodenal ulcers and increasing cardiovascular insufficiency in 2 patients operated on for perforated ulcers.

Of the 19 patients who underwent resection of 2/3 of the stomach, 4 patients died in the early postoperative period, and 1 patient died after resection of the pylorus and duodenal bulb.

After organ-preserving operations with vagotomy, the worst results were noted in the group of patients who underwent anterior hemipylorotomy with transverse pyloroplasty compared with patients who underwent gastroduodenostomy according to Finney. Thus, out of 59 patients after transverse pyloroplasty, various complications were observed in 17 (28.8%) Thus, a recurrence of bleeding from a stitched ulcer of the posterior wall was observed in three (5.08%), the failure of pyloroplasty sutures with the development of an intra-abdominal abscess in 2 patients (3, 38%). Violations of the evacuation function of the stomach due to anastomosis were noted in 12 patients (20.3%). Mortality after hemipylorotomy was 3.38% - 2 patients with severe blood loss died, operated urgently due to massive bleeding from giant ulcers of the pyloric canal. They were diagnosed with the failure of the pyloroplasty sutures on the 4th and 5th days, for which they were operated on again. Death occurred from increasing cardiovascular insufficiency.

After Finney’s operation, 3 patients had suppuration of the wound and one patient had hospital pneumonia in 2 patients. There were no fatalities.

Violation of evacuation from the stomach in the early postoperative period was noted in 51 out of 130 patients (39.2%) (Table 2).

All surgery (n=130)	Hemipylorotomy with transverse pyloroplasty (n = 59)	Finney’s operation (n = 31)	Gastric resection (n = 22)
51 (39,2%)	5 (8,5%)	14 (45,2%)	8 (36,4%)

Table 2: Violation of the evacuation function of the stomach in the postoperative period.

Gastrostasis in these periods were more often observed after Finney’s surgery (45.2%) and after anterior hemipylorotomy with transverse pyloroplasty (52.5%). In patients who underwent transverse pyloroplasty, evacuation disorders were caused by edema in the area of the anastomosis, whereas after gastroduodenostomy according to Finney, most patients in the area of pyloroplasty had moderate swelling of the mucosa while maintaining a sufficient diameter of the anastomosis. Evacuation disorders in these patients were associated with the error of performing the intervention when the distal branches of the Latarge nerve were involved in the formation of the second row of sutures. In the future, if the recommendations given by the author of the operation were followed, such complications were not observed.

Discussion

Despite many years of extensive discussion in the literature of the results of surgical treatment of complications of gastric ulcer and duodenal ulcer, there are relatively few works that would give a comparative assessment of surgical methods of treatment in patients with complicated giant pyloroduodenal ulcers [11,15]. The available works usually relate mainly to one method of treatment in this category of patients [15,16]. The analysis of publications indicates that there is no consensus among surgeons regarding the volume and nature of surgery for bleeding or perforation of giant ulcers.

The interest in giant ulcers is explained by the fact that surgical treatment of their complications, usually combined, is a serious problem in urgent surgery. The course of the disease in patients with giant ulcers often has a complicated character; most of them surgical interventions are performed for emergency and urgent indications due to perforation of the ulcer or profuse ulcerative bleeding, against the background of severe blood loss. The massive cicatricial-inflammatory perifocal changes that occur, spreading to neighboring structures and organs over a long period, cause non-standard situations during surgery, greatly complicating the performance of not only gastric resection, but minimal palliative operations.

A clinical analysis was carried out in 130 patients with giant complicated pyloroduodenal ulcers, who underwent various surgical interventions in the period from 2000 to 2019 at the City

clinical hospital named after S. S. Yudin in Moscow: gastric resections, organ-preserving operations with vagotomy, as well as palliative surgical interventions consisting in suturing a perforated hole or stitching bleeding vessels in an ulcerative crater. Most of the patients were men under the age of 50. Ulcerative anamnesis occurred in 76.3% of patients, in the rest the course of the disease was asymptomatic. Of the total number of patients, 71 patients (54.6%) were operated on for ulcer perforation, and 59 patients (45.4%) surgical interventions were performed in connection with ulcerative bleeding. The majority of patients with perforation of giant pyloroduodenal ulcers had serous (29.5%) or serous-fibrinous (50.7%) peritonitis. The majority of patients with bleeding giant pyloroduodenal ulcers had moderate (47.4%) blood loss, or severe blood loss (22.1%). All 130 patients had two or more complications of peptic ulcer disease, as well as stenosis of the gastric outlet, in most cases-sub-compensated. Penetration into neighboring organs and structures was observed in 73 (56.1%) patients.

Taking into account the nature of the performed surgical interventions, all patients were divided into 4 groups. The first group included 59 patients who underwent transverse pyloroplasty in combination with combined vagotomy after excision of a perforated or bleeding giant ulcer of the anterior wall of the pylorus.

The second group consisted of 31 patients with localization of a giant ulcer in the duodenal bulb, who underwent gastroduodenostomy according to Finney in combination with combined vagotomy.

The third group included 22 patients who underwent pylorus and duodenal bulb resection or resection of 2/3 of the stomach with a circular giant ulcer with gastroduodenoanoanastomosis.

And the fourth group included 14 patients who underwent palliative interventions: suturing of a perforated ulcer or stitching of bleeding vessels in an ulcer with pyloric or duodenoplasty. Penetration into neighboring organs and structures was observed in 73 (56.1%) patients.

Complications in the early postoperative period were observed in 36 of 130 patients (27.7%), 14 patients (10.7%) died.

As follows from the analysis of resection methods of surgical treatment of complicated giant pyloroduodenal ulcers, these interventions were accompanied by a high mortality rate of 22.7%. In

addition, after gastric resection, many early postoperative complications were observed, the most frequent of which was a violation of the evacuation function of the stomach stump due to anastomosis, observed in 36.4% of patients.

Unsatisfactory results of gastric resection in complicated giant pyloroduodenal ulcers served as the basis for a comparative evaluation of resection methods of treatment and organ-preserving operations with vagotomy in patients with complicated giant pyloroduodenal ulcers. Gastric resection in this category of patients can also be considered forced due to the inability to perform organ-preserving operations with circular or multiple ulcerative defects.

Hemipylorectomy with transverse pyloroplasty and combined vagotomy was performed when the ulcer was localized in the pyloric canal (the pyloric canal, 0.5 cm proximal and distal to it). Complications in the early postoperative period were observed in 28.8% of patients and were associated with the nature of intervention in the pyloroduodenal region. Thus, violation of evacuation from the stomach due to anastomosis in the early postoperative period in 12 (20.3%) patients. In 3 patients, there was a recurrence of bleeding from a stitched ulcer of the posterior wall, two of them were operated on again: repeated stitching of bleeding vessels was performed. The failure of pyloroplasty sutures with the development of an intra-abdominal abscess was observed in 2 patients, which required relaparotomy.

Gastroduodenostomy according to Finney was performed when a giant ulcer was localized in the bulb of the duodenum. The most frequent complication in the early postoperative period was gastrostasis, noted in 45.2% of patients, the cause of which was not an anastomosis error during the intervention associated with the involvement in the second row of sutures of the anterior wall of the gastroduodenal junction of the motor branches of the Latarge nerve. It should be noted that among the patients who underwent gastroduodenostomy according to Finney, there was no failure of sutures or recurrence of bleeding from a stitched ulcer. There were also no deaths.

Comparative postoperative results indicate that gastroduodenostomy according to Finney gives better results than transverse pyloroplasty and gastric resection in patients with complicated giant pyloroduodenal ulcers, and can be recommended as an operation of choice, except in cases where there are extensive circular

and multi-focal ulcerative defects, which makes it impossible to perform drainage surgery. With such ulcerative lesions in the area of the pylorus and duodenum, the only possible intervention is gastric resection.

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