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Comprehensive Management of Gastroduodenal Bleeding and Pecularities of Gastroduodenal Lesions in Patients with Liver Cirrhosis

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Abstract Clinical diagnosis of gastroduodenal erosions and ulcers in patients with liver cirrhosis is difficult due to the lack of unique symptoms and anamnestic data. Treatment of ulcer bleeding of patients with intrahepatic portal hypertension is still no solved sophisticated issue of the urgent surgery. Differentiated approach to the treatment of bleeding of the gastroduodenal zone could play the core role in this regard. **Objective.** To study treatment results for patients with bleeding from erosive and ulcerative lesions of the gastric and duodenal mucosa among patients with varicose veins of the esophagus and stomach and the features of erosive and ulcerative lesions of the gastroduodenal zone in patients with cirrhosis of the liver in combination with or without portal hypertensive gastropathy. **Materials and methods.** In the period from 2021 to 2023, 364 patients with suffering from cirrhosis of the liver, erosive and ulcerative lesions of the gastroduodenal zone, of whose 83 patients (23% of the total number of subjects) were included in the study who experienced bleeding from erosions and ulcers of the gastrointestinal tract and varicose veins of the esophagus and stomach. The study participants were divided into two groups: the patients with (n=55) and without portal hypertensive gastropathy (PHG) (n=28). **Results.** The age of the patients ranged from 25 to 75 years. In 28 patients (37,73%), the source of bleeding was ulcers of the stomach and duodenum, among which 7 cases related to the stomach and 21 to the duodenum. In the remaining 12 patients (14,4%), bleeding occurred simultaneously from varicose veins and gastroduodenal ulcers. 21 patients (25,3%) showed signs of cessated bleeding on admission, while 62 patients (74,7%) had ongoing bleeding. In 40 of these patients (48,2%), suffering from active bleeding, underwent endoscopic hemostasis, the goal of which was to stop bleeding from both varicose veins of the esophagus and stomach, and from gastroduodenal ulcers. Effective hemostasis was achieved in 35 cases (87,5%) and no death was observed. In cases where the source of bleeding was varicose veins of the esophagus and stomach, endoscopic sclerotherapy sessions were performed using a 3% solution of ethoxysclerol. 9 patients (10,8%) underwent emergency surgery. Of the group of patients who underwent urgent surgical interventions, 2 patients (22,2%) had recurrent bleeding from varicose veins of the esophagus and stomach, resulted in death due to worsening liver failure. In 28 patients (33,7%), bleeding was successfully stopped using conservative treatment methods. However, in this group, 3 patients had a fatal outcome due to acute hepatic-renal failure (10,7%). Patients with Child-Pugh class B liver cirrhosis was more likely to experience erosive and ulcerative lesions of the gastroduodenal zone compared to patients of the same class without PHG (p=0,004). There were no differences in the localization, the size and number of ulcers of the gastroduodenal zone and in the frequency of ulcerative bleeding in liver cirrhosis patients with PHG and without PHG (p>0,05). **Conclusions.** The choice of treatment tactics in patients with gastroduodenal bleeding requires an integrated approach. It is important to consider not only the intensity of bleeding and the degree of liver failure, but also to determine the presence of one or more sources of hemorrhage. This includes a detailed examination of all potential causes of bleeding and an individual approach to each case. No differences in the localization, the size and number of ulcers of the gastroduodenal zone and in the frequency of ulcerative bleeding in liver cirrhosis patients with PHG and without PHG highlight the importance of further study in this area.

Keywords Portal hypertension, Liver cirrhosis, Bleeding, Portal hypertension gastropathy, Erosion and ulcer

1. Introduction

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A complete understanding of the mechanisms of formation of erosions and ulcers in patients with cirrhosis of the liver remains the subject of research. There is only limited data on the features of gastroduodenal lesions in cirrhosis with portal gastropathy. The development of hepatogenic ulcers is associated with stagnation of blood in the gastroduodenal zone, changes in blood composition, a decrease in oxygen

saturation of the tissues of the stomach and duodenum, leading to ischemia of their walls and acidemia, as well as, to a lesser extent, with acid-peptic factor [1,17]. Jean Auroux and others (2003) show the presence of gastroduodenal ulcers in 23,4% of patients [2], while Shafi F. et al. found gastroduodenal ulcers in 9,6% of patients with cirrhosis of the liver [14]. In recent studies, stomach ulcers in cirrhosis were more common in 27,3 % [19] and in 33% cases [18].

A relationship was found between the frequency of ulcerative lesions and the stage of compensation for cirrhosis of the liver, especially in class B according to Child-Pugh [10]. Literature data showed that gastroduodenal ulcerative bleeding was observed in a wide range from 2% to more than 40% of patients with cirrhosis of the liver [12,13,15,16].

In Uzbekistan, like other regions, there are differences in the quality of medical care when dealing with such cases. Traditionally used wait-and-see tactics based on conservative treatment often do not bring the desired results, which indicates the need to improve treatment approaches.

The improvement of therapeutic results is possible through the integration and optimization of existing hemostasis methods and the development of comprehensive therapeutic programs, including timely surgical interventions and correction of impaired body functions.

As part of an extensive study of ulcerative bleeding associated with cirrhosis of the liver, Kolosovych and his colleagues (2023) point out that erosions and ulcers in the upper gastrointestinal tract are often the result of exposure to cirrhosis of the liver, although it was previously thought that they could be manifestations of portal hypertension [11]. In the context of this issue, it is important to note that the frequency of ulcerative lesions of the gastroduodenal zone does not demonstrate a direct connection with Helicobacter pylori infection [4,7]. However, alcohol consumption, as studies have shown, significantly increases the risk of developing such gastroduodenal erosions [7].

In general, research in this area highlights the difficulty of diagnosing and choosing therapeutic tactics for ulcerative bleeding in patients with cirrhosis of the liver [8,12]. The treatment approach should take into account not only the features of cirrhosis, but also possible complications associated with it, such as ulcerative lesions of the stomach and duodenum [3]. This requires a comprehensive approach, including both drug treatment and, if necessary, surgical intervention, especially in situations of severe disease.

Thus, the characteristics of erosive and ulcerative lesions of the gastroduodenal zone in patients with cirrhosis of the liver, especially in the context of ulcerative bleeding, are still insufficiently studied [9]. In particular, there are few such studies in the Republic of Uzbekistan.

2. Materials and Methods

The study, conducted from 2021 to 2023 in the surgical department of the Bukhara branch of the Republican Scientific Center for Emergency Medical Care, included 364 patients with cirrhosis of the liver. Upon admission, to assess the condition of the mucous membrane of the esophagus, stomach and duodenum in all patients, oesophagogastroduodenoscopy was performed according to a standard technique using the “FUJINON” device (Japan). During the examination, the localization of erosive and ulcerative lesions, the size of ulcers and the intensity of bleeding from them were evaluated, classifying them according to the classification of J.A. Forrest [7]. The severity of portal hypertensive gastropathy (PHG) was assessed according to the criteria of Baveno III [6]. The Child-Pugh classification was used to determine the stage of compensation for cirrhosis of the liver [5]. The study participants were divided into two groups: the patients with and without PHG (comparison group). The analysis of the collected data was carried out using the SPSS 22.0 statistical package. To test statistical hypotheses, a criterion with a critical significance level of $p<0,05$ was used.

3. Results and Discussion

Of the 364 patients diagnosed with liver cirrhosis, 83 patients (approximately 23%) had bleeding from erosive ulcerative lesions of the stomach and duodenum, who were included in this study. The age group of these patients ranged from 25 to 75 years, while the majority of them 55 (66,37%) were of working age, that is, in the range from 40 to 60 years. Men made up the majority of this group (67,47%, or 56 patients), while there were 27 women (32,53%).

43 of these patients (51,8%) suffered from bleeding caused by varicose veins of the esophagus and stomach. In 28 patients (37,7%), the source of bleeding was ulcers of the stomach and duodenum, among which 7 cases related to the stomach and 21 to the duodenum. In the remaining 12 patients (14,4%), bleeding occurred simultaneously from varicose veins and gastroduodenal ulcers (Table 1).

Table 1. Distribution of patients with cirrhosis of the liver in different categories, n (%)

Parameters	Number of patients	Percentage of total
Total quantity of patients with liver cirrhosis	364	100%
Upper gastrointestinal bleeding by liver cirrhosis	83	22,8%
Men	56	67,4%
Women	27	32,5%
At working age (40-60 years)	55	66,3%
Bleeding from varicose veins	43	51,8%
Bleeding from ulcers	28	33,7%
Bleeding simultaneously from varicose veins and ulcers	12	14,4%

The diagnosis of the disease was based on a comprehensive analysis, including patient complaints, medical history, clinical signs, laboratory test results (including for hepatitis

markers) and instrumental studies.

According to Child-Pugh classification, patients were divided into three groups: Class A – 24 patients (28,9%), class B – 52 patients (62,6%), and class C – 7 patients (8,4%). The majority of patients belonged to group B (Table 2).

In this study, 21 patients (25,3%) showed signs of cessated bleeding on admission, while 62 patients (74,7%) had ongoing bleeding. In 37 of these patients (44,6%), suffering from active bleeding, conservative treatment was carried out, the goal of which was to stop bleeding from both varicose veins of the esophagus and stomach, and from gastroduodenal ulcers (Table 3). The treatment strategy included the use of replacement therapy and hemostatic drugs, as well as medications to reduce portal pressure, including β-blockers, nitrates, antisecretory and antacid agents.

Table 2. Dependence of erosive and ulcerative lesions of the gastroduodenal zone on the degree of compensation for liver cirrhosis in children according to the Child-Pugh criteria

Parameters	Number of patients	Percentage of total
Class A	24	28,92%
Class B	52	62,65%
Class C	7	8,43%

It should be noted that the data obtained highlight the complexity of treating ulcerative bleeding against the background of liver cirrhosis, which requires an individual approach to each case, including the use of various methods to stop bleeding and, if necessary, surgical intervention.

Table 3. Patient categorization in the bleeding study

Parameters	Number of patients	Percentage of total
Patients with cessated bleeding	21	25,3%
Patients with ongoing bleeding	62	74,7%
Patients treated conservatively	37	44,6%

Table 4. Distribution of patients by treatment methods and outcomes

Treatment methods	Number of patients	Percentage of total
Endoscopic hemostasis	40	48,2%
Conservative treatment	28	33,7%
Urgent surgical interventions	9	10,84%
Effective hemostasis after endoscopic interventions	35	87,5%
Death (total)	5	6,0%

Note: Percentages reflect the proportion of patients who received each treatment and outcome relative to the total number of study participants.

As part of the study, 40 patients (48,2%) underwent endoscopic hemostasis to stop bleeding. In the presence of bleeding from an ulcer, methods were used including the introduction of an alcohol-adrenaline mixture around the source of bleeding, the use of a solution of aminocaproic acid, and monopolar coagulation to coagulate the bleeding areas (Table 4).

In cases where the source of bleeding was varicose veins of the esophagus and stomach, endoscopic sclerotherapy sessions were performed using a 3% solution of ethoxysclerol (from 2,0 to 10,0 ml), as well as endoscopic ligation. During one session, depending on the degree of varicose veins, from 6 to 10 ligatures with latex rings were applied. Repeated sessions of endoscopic treatment due to recurrent bleeding were necessary in 7 cases (17,5%). For 2 patients (5,0%) in whom endoscopic hemostasis did not yield the desired effect, laparotomy was performed, including gastrotomy and suturing of varicose veins.

9 patients (10,8%) underwent emergency surgery. Of these, three had ulcerative bleeding against the background of varicose veins of the esophagus and stomach, two had bleeding from a duodenal ulcer, and one had simultaneous bleeding from an ulcer of the pyloric part of the stomach and duodenum.

When performing gastric resection, unique causative factors were discovered in two special cases. In one case, the decision to perform resection was due to the presence of an extensive duodenal ulcer penetrating the pancreas, which could not be effectively sutured. In another case, the reason for resection was a giant gastric ulcer measuring more than 3 cm. Of the group of patients who underwent urgent surgical interventions, 2 patients (22,2%) had recurrent bleeding from varicose veins of the esophagus and stomach, resulted in death due to worsening liver failure.

In 28 patients (33,7%), bleeding was successfully stopped using conservative treatment methods. However, in this group, 3 patients had a fatal outcome due to acute hepatic-renal failure (10,7%).

In the case of endoscopic interventions, effective hemostasis was achieved in 35 cases (87,5%). There were no deaths recorded in this group. The overall case fatality rate in the study was 6,0% (5 cases).

Among 83 patients with erosive and ulcerative lesions of the gastroduodenal zone, PHG was detected in 55 (66,2%) patients, who made up group 1, while the remaining patients did not suffer from PHG (n=28; 33,8%). When comparing the frequency of erosions and ulcers in women of the two indicated groups, their higher frequency was established in women with PHG (39,3% and 21,3%, p =0,01) compared to the group without PHG, which was not observed among male.

Table 5. Erosive and ulcerative lesions of the gastroduodenal zone in patients with and without PHG, depending on the degree of compensation for liver cirrhosis according to the Child-Pugh criteria

Stages of compensation for liver cirrhosis	1-group PHG (n=55)	2-group without PHG (n=28)	P
Class A	16 (29,1%)	6 (28,5%)	0,994
Class B	39 (70,9%)	13 (46,4%)	**0,004**
Class C	5 (9,1%)	2 (7,1%)	0,376

When analyzing the frequency of erosive and ulcerative lesions of the gastroduodenal zone depending on the degree of compensation for liver cirrhosis according to Child-Pugh,

it turned out that erosions and ulcers with PHG against the background of class A liver cirrhosis were in 16 (29,1%) out of 55, and without PHG - in 28 (28,5%) of 28 (p=0,994), with class B – in 39 (70,9%) and 13 (46,4%) (p=0,004), with class C – in 5 (9,1%) and 2 (7,1%) (p=0,376), respectively (Table 5).

Thus, against the background of PHG, patients with Child-Pugh class B liver cirrhosis were more likely to experience erosive and ulcerative lesions of the gastroduodenal zone compared to patients of the same class without PHG.

The localization of erosions and ulcers of the gastroduodenal zone in patients with liver cirrhosis was studied. Erosive-ulcerative lesions in both groups were in the stomach: in 74 patients (89,1%) and only in 8 (9,6%) in the duodenal bulb (p<0,001) (Table 6).

Erosive and ulcerative lesions were more often in the stomach (in 50 patients – 90,9%) and more less in duodenal bulb in 5 patients (9,1%) (p <0,001) in liver cirrhosis patients with PHG. At the same time, in the stomach, erosions and ulcers predominated in the antrum - in 37 (67,3%), while in the body of the stomach they were only in 9 (16,3%), and in the cardial region - in 4 (7,3%) patients. In liver cirrhosis without PHG, erosive and ulcerative lesions were also more often in the stomach (in 24 patients – 85,7%) and in the duodenum in 3 people (10,7%) (p<0,001). In the stomach, erosions and ulcers predominated in the antrum - in 18 (64,3%), in the body of the stomach in 4 (14,3%), and in the cardial region - in 2 (7,1%) patients (Table 6).

Table 6. Localization, size and quantity of erosions and ulcers of the gastroduodenal zone between two groups

Parameters	1-group PGG (n=55)	2-group without PGG (n=28)	P
Stomach	50 (90,9%)	24 (85,7%)	0,885
Antral	37 (67,3%)	18 (64,3%)	0,467
Body	9 (16,3%)	4 (14,3%)	0,283
Cardial	4 (7,3%)	2 (7,1%)	0,976
Duodenal bulb	5 (9,1%)	3 (10,7%)	0,746
0,5-1,0 cm	33 (60,0%)	17 (60,7%)	0,945
1,1-2,0 cm	20 (36,4%)	9 (32,1%)	0,436
>2,0 cm	4 (7,3%)	2 (7,1%)	0,926
Single ulcers	42 (76,3%)	22 (78,5%)	0,824
Multiple ulcers	13 (23,7%)	6 (21,5%)	0,938

There were no differences in the localization of erosions and ulcers of the gastroduodenal zone in liver cirrhosis patients with PHG and without PHG (p>0,05). We also did not identify statistically significant differences in the size and number of ulcers in patients with liver cirrhosis with and without PHG (p>0,05). There were also no differences in the frequency of ulcerative bleeding between the groups of patients with and without PHG (p>0,05).

4. Conclusions

Based on extensive research, the following key aspects can be identified regarding the diagnosis and treatment of patients with erosive and ulcerative lesions of the stomach and duodenum against the background of liver cirrhosis.

The incidence of gastric and duodenal ulcers in patients with liver cirrhosis is approximately 22,8%. This figure is consistent with the results obtained in other studies, highlighting the prevalence of this pathology in this category of patients.

The choice of treatment tactics in patients with gastroduodenal bleeding requires an integrated approach. It is important to consider not only the intensity of bleeding and the degree of liver failure, but also to determine the presence of one or more sources of hemorrhage. This includes a detailed examination of all potential causes of bleeding and an individual approach to each case.

Data analysis supports the importance of endoscopic hemostasis as the preferred treatment method in these cases. Endoscopic hemostasis not only provides effective stoppage of bleeding, but also allows for minimally invasive intervention, reducing the risk of complications and accelerating the patient's recovery process.

Thus, the present study highlights the importance of an individualized approach in the diagnosis and treatment of peptic ulcer disease in patients with liver cirrhosis. This confirms the need for a careful analysis of each clinical case, taking into account the characteristics of the pathology and the general condition of the patient, in order to achieve the most effective and safe treatment results.

Although there were no statistically significant differences in localization, size and number of ulcers of the gastroduodenal zone, ulcer bleeding rates between groups with and without PHG or between different Child-Pugh cirrhosis classes, the study results highlight the importance of further study in this area.

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