

MODERN METHODS OF THERAPY OF ACUTE GASTRODUODENAL BLEEDING IN PATIENTS WITH SEVERE BURNS

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ABSTRACT

Among the causes of gastrointestinal bleeding, stress ulcers occupy the second place, second only to chronic ulcers of the stomach and duodenum and account for 10-20% of all causes of hemorrhage. Relapses of bleeding from acute stress ulcers, with a mortality rate of 60-90%, are particularly dangerous.

The Purpose of the Research:*To develop methods of treatment of patients with bleeding from acute gastroduodenal ulcers in severely burned.*

Materials and Methods *In the burn department of the Samarkand City Medical Association, 78 seriously burned people with bleeding from acute gastroduodenal ulcers have been cured over the past 10 years. The average age of patients was 51±16 years, of which 46.4% were over 60 years old. The total area of thermal damage to the skin indicated a significant severity of thermal injury, and was equal to 36.7 ± 7.7% of the body surface. All patients were divided into two groups. The main group (n=46) and the control group (n=36).*

Results. *As a result of the study, we found out that the risk of erosive and ulcerative lesions of gastroduodenal zones, including those complicated by gastroduodenal bleeding, increases with an increase in the total area of the burn lesion, especially with an area of more than 40% p.t. In this regard, it is necessary to perform EGDFS upon admission to the hospital of patients with burns of more than 40%, which allows timely detection of erosive and ulcerative changes from the gastroduodenal zones, to begin their treatment and prevention gastroduodenal bleeding.*

Increased development of vascular-endothelial dysfunction leads to vascular damage. This showed a marked development of endothelial dysfunction.

Argon plasma coagulation was the most effective method of hemostasis in bleeding from acute stressful gastroduodenal ulcers in severely burned patients, rather than injection and radio wave hemostasis.

Conclusions. *Thus, stable hemostasis during bleeding from acute gastroduodenal ulcers in severely burned patients was achieved in the control group against the background of antisecretory therapy with H₂-receptor blockers only in 77.8% of cases, in the main group against the background of antisecretory treatments and with the addition of dopamine D₂-receptor blockers (domperidone) and L-arginine, stable hemostasis was achieved in 88.1% of cases.*

KEYWORDS: *Gastroduodenal, Hemostasis, Endothelial, Antisecretory, Ulcerative.*

INTRODUCTION

Gastroduodenal complications occur with thermal injuries of 15-25%. The most frequent complication of acute gastroduodenal ulcers in severely burned patients is bleeding[1,4,7]. At the same time, it should be noted that after thermal injuries, the mortality rate for bleeding from acute gastroduodenal ulcers remains high and reaches 25-75%[5,7]. Treatment of patients with bleeding from acute gastroduodenal ulcers in severely burned patients, despite the introduction of new surgical, endoscopic and drug treatment methods into practice, remains an urgent and complex problem in surgery [2,5,11].

Treatment of stress gastroduodenal ulcers complicated by bleeding presents significant difficulties. There is no uniform management tactics for patients with this complication. To date, the problems of the effectiveness of various methods of endoscopic hemostasis, therapy with antisecretory drugs remain unresolved [3,12].

Due to the fact that often the clinical signs of the appearance of acute gastroduodenal ulcers and their complications in severely burned patients are masked by various symptoms during severe systemic organ dysfunction, most of them are diagnosed late[6,9]. There is no doubt about the need for preventive measures that reduce the likelihood of stress ulcers in severely burned patients. However, the methods of prevention and the category of patients remain unclear, which makes it necessary to carry them out [8,13].

The Purpose of the Research: To develop methods of treatment of patients with bleeding from acute gastroduodenal ulcers in severely burned.

Materials and Methods: In the burn department of the Samarkand City Medical Association, 80 seriously burned people with bleeding from acute gastroduodenal ulcers have been cured over the past 10 years. The average age of patients was 51±16 years, of which 46.4% were over 60 years old. The total area of thermal damage to the skin indicated a significant severity of thermal injury, and was equal to 36.7 ± 7.7% of the body surface. By localization, acute gastric ulcer was the source of bleeding in 38 (47.5%) patients, acute duodenal ulcer in 19 (23.7%). Combined localization of ulcers was detected in 23 (28.8%) patients, but the source of bleeding was only one.

Analysis of feces for hidden blood in burned patients can play an important role in the diagnosis of stress ulcers complicated by bleeding. The benzidine reaction of Gregersen (J.P. Gregersen) is very sensitive and becomes positive already with blood loss of 2-5 ml. But preliminary preparation of the patient is required. We performed the Gregersen benzidine reaction in 58 patients in the stage of shock and acute burn toxemia in dynamics. The Weber-Van Deen reaction gives a positive result with blood loss of 30-50 ml and does not require special training of patients and was carried out in 22 patients.

All patients were divided into two groups. Patients of the main group (n=42) underwent anti-ulcer therapy for 7 days (Pantaprazole 40 mg i / v per day, kvamatel 20 mg i / v 3 times a day, amoxiclav - 50 mg / kg / day +tinidazole - 50 mg / kg/ day). In addition, prokinetics - blockers of dopamine D₂ receptors (domperidone) - suspension, 10 mg through a nasogastric probe or inside, the drug L-arginine – 100ml intravenously and active surgical tactics (early necrotomy, necrectomy with autodermoplasty) were used to correct vascularendothelial dysfunction. Also, the main group included 12 patients with a high propensity for gastroduodenal complications, who had a history of chronic gastropathy or were constantly taking ulcerogenic drugs.

Patients of the control group (n=38) were treated only with H₂-receptor blockers for anti-ulcer therapy and traditional treatment with wait-and-see surgical tactics. In this group, a high propensity for gastroduodenal complications was in 9 patients who had a history of chronic gastropathy or were constantly taking ulcerogenic drugs.

Esophagogastroduodenofibroskopy (EGDFS) was performed proactively in dynamics on 1,3,7,14 and 21 days, if necessary and at a later date. The endoscopic classification of J. Forest (1989) was used to assess ulcerative bleeding. The following methods were used to perform endoscopic hemostasis: injection, argonoplasma coagulation, radio wave coagulation. Angiogenesis and vasculoendothelial growth factor, the role in the pathology of the gastrointestinal tract in severely burned patients were also studied. To do this, the vascular endothelial growth factor (VEGF) was determined. In addition, the role of Helicobacter pylori on the formation of acute gastroduodenal ulcers with complicated gastroduodenal bleeding in severely burned patients was studied. For enzyme immunoassay of centrifuged blood serum, the amount of vascular endothelial growth factor was studied using the test system of CJSC Heliko Best – antibodies and Vector-Best (Russia, Novosibirsk). Twelve healthy individuals were selected for control.

The data obtained during the study were entered in the form of a spreadsheet in the Microsoft Excel 2013 application program. Statistical processing of the material was carried out using the corresponding functions of Microsoft Excel 2013 and the IBM SPSS Statistics Base 22.0 program.

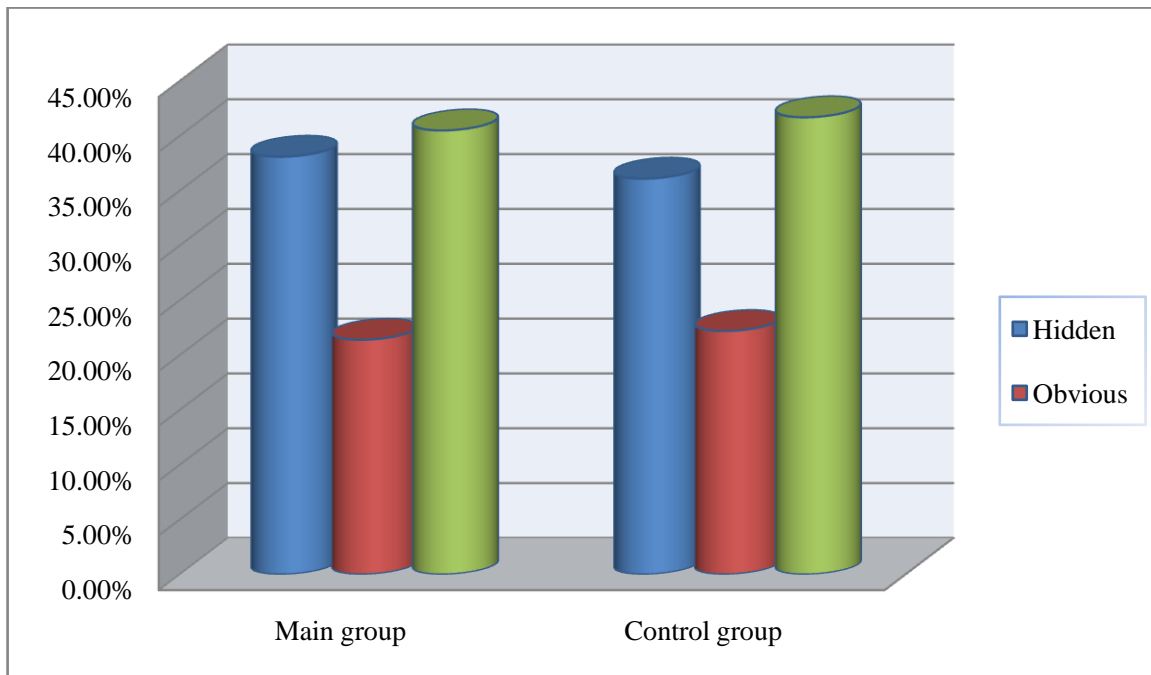
Results Gastroduodenal bleeding in severely burned patients was observed in 29 (36.2%) of 80 patients in the form of vomiting or coffee grounds from a nasogastric probe. Bleeding in the form of melena was observed in 24 (30%) patients. Simultaneous observation of these two symptoms was detected in 27 (33.8%) patients.

In patients with gastroduodenal bleeding, excitement (in 3 patients), inhibition (in 4 patients), a feeling of thirst or hunger (in 7 patients) were observed. Tachycardia (115-120 beats) was observed in all patients. per minute), hypotension in 31 (90-100 mmHg), tachypnea (24-28 per

minute). Clinical and endoscopic data provided the basis to determine diagnostic and therapeutic tactics.

According to the classification of D.J. Cook et al. (1994) identified latent, explicit and hemodynamically significant bleeding (Fig. 1).

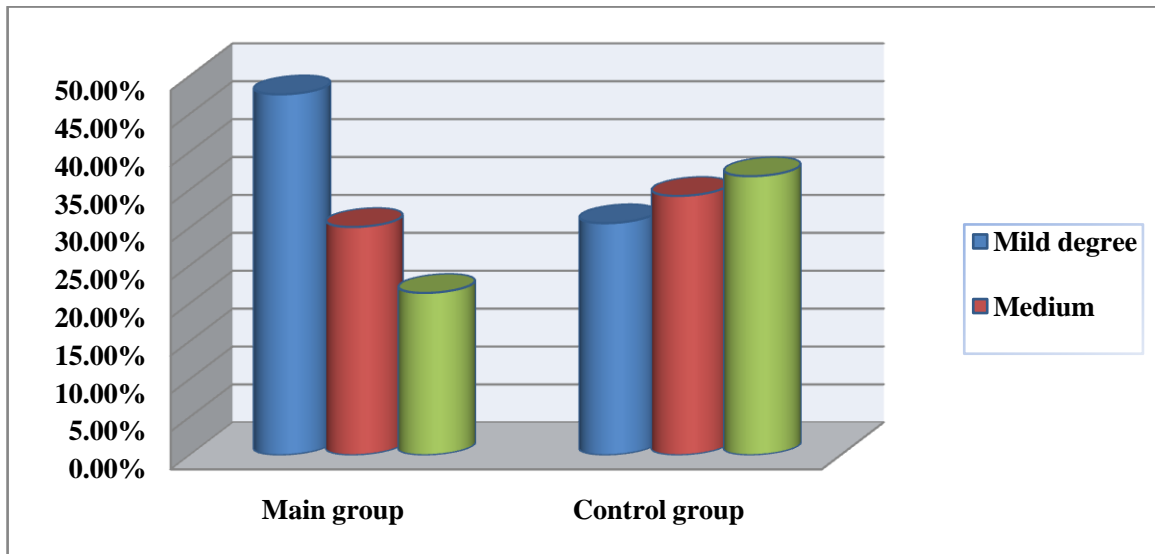
Figure 1 Distribution of patients by the nature of gastroduodenal bleeding (classification by D.J. Cook)



In 29 (35.4%) of the victims, the clinical signs of gastroduodenal bleeding were hidden. These patients underwent fecal analysis for latent blood. In 17 victims, Gregersen's benzidine reaction was positive, and Weber's reaction in 12 victims. The diagram shows that in the main group with gastroduodenal bleeding, obvious and hemodynamically significant indicators are observed less compared to the control group.

The severity of blood loss that developed against the background of gastroduodenal bleeding was assessed based on a comparison of laboratory, clinical and instrumental data in accordance with the classification of A.I. Gorbashko. In the main group, 20 (47.6%) patients were diagnosed with mild bleeding from severely burned. Average bleeding was detected in 13 (30.1%) patients, severe blood loss - in 9 (21.4%) patients. In the control group, 11 (30.6%) patients were diagnosed with mild bleeding. Moderate bleeding was detected in 13 (34.2%) patients, severe blood loss - in 14 (36.8%) patients (Fig. 2).

Figure 2 Distribution of patients by classification according to A.I. Gorbashko

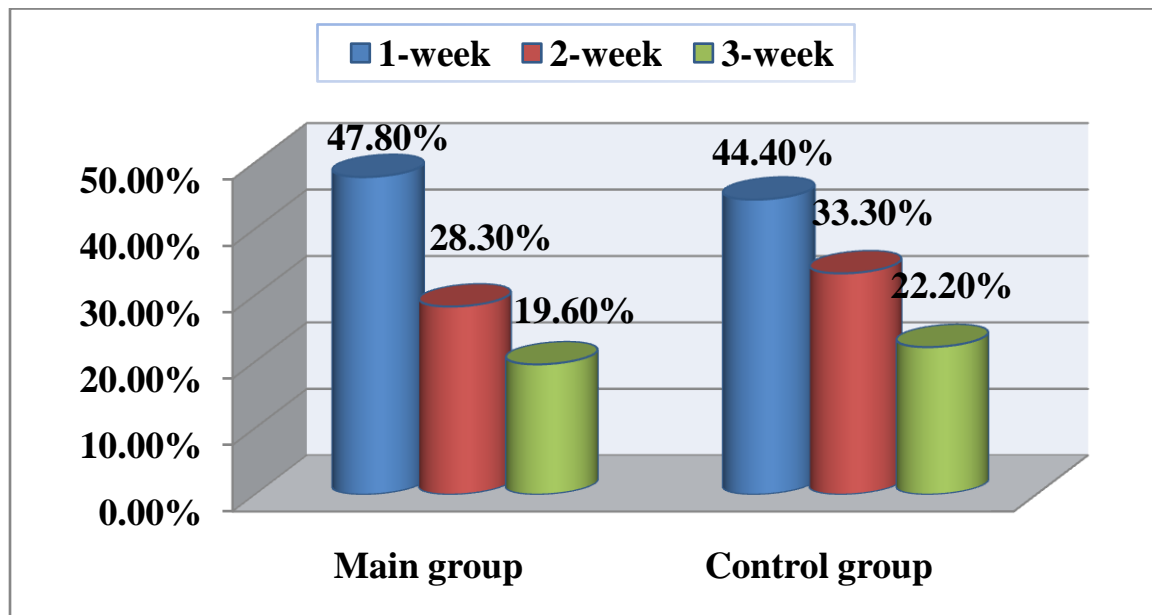


After gastroduodenal bleeding in the main group of patients of moderate and severe severity, there was less relative to patients of mild severity, and the opposite was observed in the control group.

Thus, bleeding from acute stressful gastroduodenal ulcers worsened in 1 out of 3 cases.

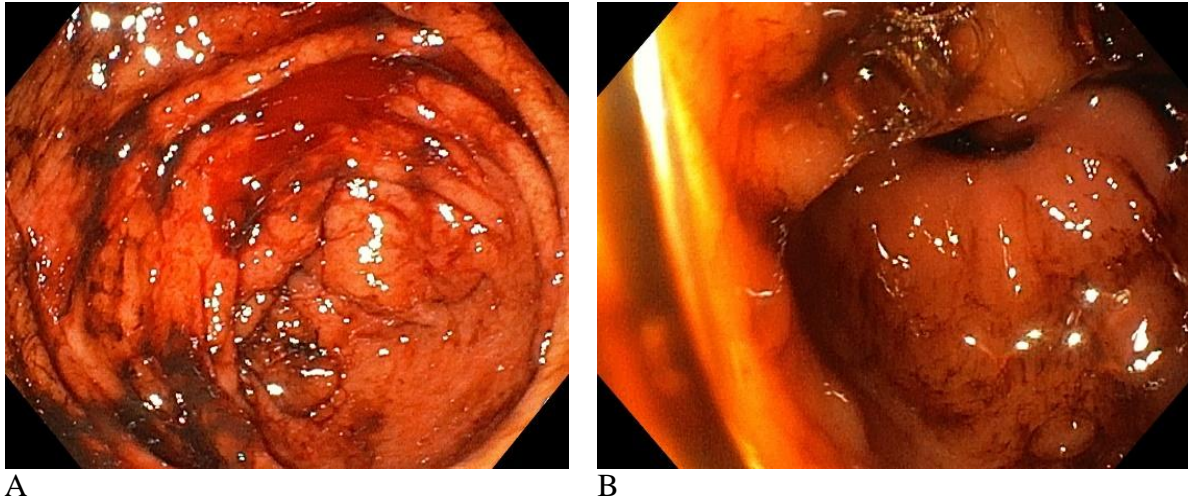
According to the time of occurrence of acute stressful gastroduodenal ulcers and the rate of bleeding complications, most of the patients were diagnosed in both groups in the first weeks from the moment of injury (Fig. 3).

Figure 3 The timing of the development of gastroduodenal bleeding from stress ulcers



Bleeding in the majority of patients (48.7%) developed as a result of alternative exposure to additional risk factors in severely burned patients, i.e. when the burn area was 40% and deep burns exceeded 20%.

Figure 4A) Bleeding from acute stress stomach ulcers F1b.



B) Bleeding from acute stress stomach ulcers F2a

According to our research, gastroduodenal hemorrhage was observed in 54.3% of patients with a total burn area of more than 40% and in 81.4% of patients with a total burn area of 20% in the first two weeks after a burn injury. In addition, gastroduodenal bleeding in the main group decreased significantly in the following weeks compared to the control group, that is, by 5% and 2.6% at week 2 and 3, respectively.

Thus, these patients need preventive and anti-ulcer treatment from the moment of admission to the hospital.

To determine the effect of *Helicobacter pylori* on the formation of acute gastroduodenal ulcers, we examined 51 patients for helicobacteriosis. Of these, 28 patients made up the main group. The second control group consisted of 23 patients. To determine the presence of contamination of the mucosa of the gastroduodenal zone of *Helicobacter pylori*, a non-invasive diagnostic method was used - a serological research method based on the determination of CagA antibodies to *Helicobacter pylori* in blood serum. To detect antibodies to *Helicobacter pylori*, the ELISA (enzyme immunoassay) method was used. Blood sampling was performed on the day of admission of patients, before the start of antibacterial therapy. Blood was obtained from the central vein. It is known that *h. pylori* is activated in patients with chronic gastropathy. Therefore, patients with a history of chronic gastropathy were also compared (Table 1).

TABLE 1 TITER INDICATORS OF H.PYLORI-CAGA ANTIBODIES IN GASTRODUODENAL BLEEDING IN SEVERELY BURNED

	3-day		7-day		14-day	
	Main	Control	Main	Control	Main	Control
With a tendency to gastroduodenal complications	0,374	0,568	0,822	1,080	1,446	1,056
Without a tendency to	0,691	0,686	0,982	1,564	1,722	2,328

gastroduodenal complications						
Control	0,665					

OP ≥ 0,419 - positive(+); OP ≤ 0,419 - negative(-).

The variation of H. pylori infection was not significantly activated on the first day of burns. It was noted that in patients with a tendency to gastroduodenal complications, the indicators were higher in a ratio of 1.5:2.3 times after 7 days and in a ratio of 3.5: 2.6 times after 14 days among the main and control groups. In patients without a tendency to gastroduodenal complications, the titer of Helicobacter pylori-CagA antibodies increased by a ratio of 1.2:1.6 times for 7 days compared with healthy people (Tab 1).

Thus, the titer of H.pylori-CagA antibodies in patients with a tendency to gastroduodenal complications is characterized by a gradual increase in the acute period of burn disease. This indicates an increase in the density of H. pylori on the gastric mucosa.

It was found that, depending on the severity and duration of the burn periods, vascular vasculoendothelial dysfunction developed in the control group, VEGF concentrations on day 3 were 10 times higher in patients with a tendency to gastroduodenal complications than in healthy patients, and 6.7 times higher in patients without a tendency to gastroduodenal complications. And on day 7, these indicators in patients with a tendency to gastroduodenal complications are 19 times higher than in healthy individuals. On day 7, in patients without a tendency to gastroduodenal complications, these values were 9.5 times higher than in healthy people. On day 14, the concentration of VEGF in patients with a tendency to gastroduodenal complications increased by 22.5 times. In patients without a tendency to gastroduodenal complications, the concentration of VEGF increased by 14.8 times compared to healthy people.

In the main group of patients, VEGF concentrations remained virtually unchanged for 3 days compared to the control group in patients with a predisposition to gastroduodenal complications, decreased to 18.5% on day 7 and to 24.2% on day 14. In patients without a tendency to gastroduodenal complications, there was a decrease of 10.9% on day 7 and 15.4% on day 14 compared to patients in the control group.

TABLE 2 VEGF CONCENTRATION IN GASTRODUODENAL BLEEDING IN SEVERELY BURNED PATIENTS

	Control			Main		
	3-day	7-day	14-day	3-day	7-day	14-day
With a tendency to gastroduodenal complications	673	1301	1512	642	1060,4	1146
Without a tendency to gastroduodenal complications	448	636	998	434	566,6	844,3
Control	67,2 mE/ml					

Thus, the use of L-arginine-containing drug in the main group of patients during all days there was a decrease in the concentration of VEGF compared with the indicators in the control group (table. 2).

Various methods of therapeutic endoscopy for gastroduodenal bleeding in severely burned patients were used in 52 (66.7%) patients. Argonoplasmic coagulation was the predominant method of endohemostasis and was used in 34 (65.4%) cases. The infiltration method accounted for a smaller proportion – in 9 (17.3%) cases, and radio wave coagulation in 9 (17.3%) cases.

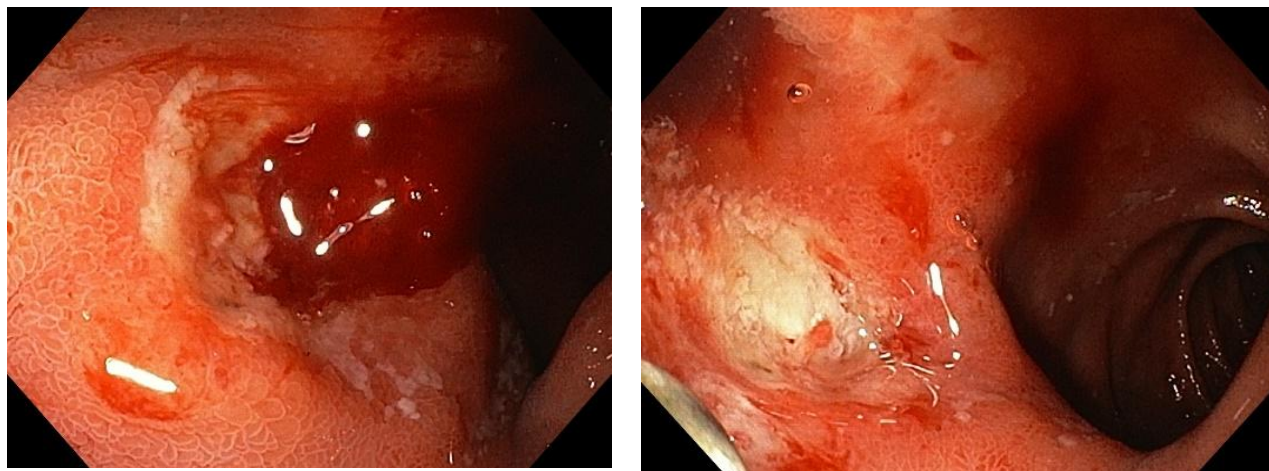
TABLE 3 DIAGNOSTIC ACTIVITY OF BLEEDING

Forrest	Classification of bleeding	Number of patients		Frequency%
		Main n=42	Control n=38	
F Ia	Ongoing active bleeding	7	6	16,2
F Ib	Ongoing capillary bleeding	8	9	21,2
F IIa	Venous bleeding	5	6	13,7
F IIb	Fixed thrombus at the bottom of ulcers	10	8	22,5
F IIc	Hematin of perchloric acid at the base of ulcers	12	9	26,2
F III	There are no signs of bleeding	0	0	0

Endoscopic manipulations aimed at stopping the ongoing ulcerative bleeding (FI) (Table. 3), were performed in 31 patients and were accompanied by the achievement of hemostasis in 29 patients. Accordingly, the effectiveness of endohemostasis as a means of stopping ulcerative bleeding was 93.5%.

In patients with Forrest Ia bleeding, bleeding was stopped in 84.6% of cases (in 11 patients out of 13). In patients with Forrest Ib bleeding, hemostasis was achieved in 88.2% of cases (in 15 patients out of 17). In one patient with FIa bleeding, endoscopic hemostasis was not performed (due to technical difficulties). With the ineffectiveness of endohemostasis, patients were operated on urgently. Comparing the effectiveness of one or another technique of endohemostasis with continued bleeding, it was revealed that the use of argonoplasmic coagulation was unsuccessful in 1 patient (with F Ia). During the infiltration of the periulcerous zone, bleeding was not stopped in 1 patient either (with FIb). When using argon plasma and radio wave coagulation, we had no failures with FIb bleeding.

Preventive endohemostasis, aimed at ensuring stable hemostasis and reducing the likelihood of its recurrence in the Forrest II picture, was performed in 29 (58% of all patients with this endoscopic picture) patients. Endohemostasis was not performed in 21 (42%) patients, as signs of stable hemostasis were noted, and the risk of possible recurrence was assessed as low (Fig. 6).



A

B

Figure6 A) Acute duodenal ulcer, complicated with hemorrhage, F-Ib.

B) The condition after stopping bleeding with argonplasmic coagulation

In patients of the first group (n=42), after 2-3 days of antisecretory treatment, the pain syndrome in the epigastric region significantly decreased, the feeling of discomfort in the stomach area, heartburn, belching almost disappeared, there was not pronounced gastrointestinal paresis. The healing of erosions with a diameter of up to 1 mm was observed on average for 8-10 days. Obvious bleeding from acute ulcers was detected in 9 (out of 42) patients (21.4%), which stopped after endoscopic therapy. One patient had a relapse on the second day.

In patients of the comparison group (n=38), pain syndrome, discomfort in the stomach, belching persisted for 7-10 days, some had vomiting with food eaten. Gastrointestinal bleeding was detected in 8 (out of 38) patients who were stopped endoscopically, but in three cases a relapse occurred.

During the study period, 6 patients were operated on for bleeding from acute gastroduodenal ulcers of severely burnt, of which 3 (3.8%) patients were operated on due to continued bleeding, 3 (3.8%) patients due to recurrent bleeding. The following types of operations were performed: gastric resection - 1; gastrotomy, stitching of a bleeding ulcer - 3; stitching of an ulcer with pyloroplasty and stem vagotomy - 2.

2 patients (33.3%) died after surgical interventions. When performing organ-preserving operations for bleeding from symptomatic gastroduodenal ulcers, the mortality rate was 16.7% (1 out of 6 patients died) ($p>0,05$).

Thus, the operation of choice for continued bleeding from symptomatic gastroduodenal ulcers is organ-preserving surgery, gastrotomy with stitching of an ulcer with a bleeding vessel, or stitching of an ulcer with pyloroplasty and vagotomy.

The total mortality rate was 13.7% (11 patients out of 80 died). Acute blood loss and posthemorrhagic anemia were the direct cause of death in 3 (27.3% of all deceased) patients with bleeding from symptomatic gastroduodenal ulcers. In the remaining 8 (72.7%) of the deceased, the cause of death was a different pathology.

Noteworthy is the fact that out of 11 deceased patients with bleeding from symptomatic gastroduodenal ulcers, 8 (72.7%) died from severe concomitant pathology with healed ulcers or ulcers in the scarring stage.

Thus, the use of modern endoscopic methods of stopping bleeding (argonoplasmic coagulation) and modern antisecretory drugs allows for the successful conservative treatment of patients with bleeding of acute gastroduodenal ulcers, minimizing the likelihood of an endoscopically irreversible recurrence of bleeding (the frequency of recurrence of bleeding was reduced from 15% to 11.7%).

Discussion: With burns, gastroduodenal bleeding, in addition to vomiting in the form of coffee grounds, abdominal pain, bleeding in the form of melena, tachycardia, tachypnea, patients have symptoms such as agitation, constipation, hunger. Also, in severely burned patients, bleeding from stressful gastroduodenal ulcers is characterized by a high tendency to hypotension against the background of burn shock and hypovolemic condition. Therefore, it is necessary to pay attention to the collection of anamnesis and clinical signs.

Latent bleeding was observed in 36.2% of patients. Therefore, in patients with the possibility of gastroduodenal bleeding, monitoring of the Gregersen benzidine reaction and the Weber reaction is a diagnostic test for timely detection of latent gastroduodenal bleeding in severe burns.

Among patients with severe burns, gastroduodenal bleeding was severe in 1 out of 3 cases. At the same time, most of the diagnosed stressful phenomena developed in the first weeks with momentary trauma.

The risk of erosive and ulcerative lesions of gastroduodenal zones, including those complicated by gastroduodenal bleeding, increases with an increase in the total area of the burn lesion, especially with an area of more than 40% p.t. In this regard, it is necessary to perform EGDFS upon admission to the hospital of patients with burns of more than 40%, which allows timely detection of erosive and ulcerative changes from the gastroduodenal zones, to begin their treatment and prevention of gastroduodenal bleeding.

In patients with a tendency to gastroduodenal complications, compared with patients without a tendency to gastroduodenal complications, an increase in *H. pylori* infection was shown in the first days of the burn toxemia period, due to the severity of the burn and a tendency to microcirculation disorders in the gastrointestinal mucosa and inflammation in the epithelium.

The increased density of *H. pylori* in the gastric mucosa has an aggressive effect, further aggravating the inflammatory activity of the mucous membrane in the gastroduodenal region. It also persists for a long time against the background of persistent inflammation. As a result, acute inflammation occurs in the gastroduodenal region and causes bleeding.

Increased development of vascular-endothelial dysfunction leads to vascular damage. This showed a marked development of endothelial dysfunction. Therefore, according to our research, high concentrations of VEGF were observed in the acute period of burns. This leads to the release of compensatory vasoactive substances that cause pathogenic hypoxic changes in the vascular endothelium. It was also found that VEGF concentrations were consistently higher in patients with a tendency to gastroduodenal complications than in patients without a tendency to gastroduodenal complications. It is associated with the proliferation of endothelial cells, which

contributes to the proliferation of blood vessels and the formation of new vessels against the background of chronic diseases of the gastroduodenal zone.

The observed relationship between the amount of VEGF in the blood serum and the severity of gastroduodenal bleeding can be explained by the activation of cytokine production under conditions of tissue hypoxia, interpreted as a mechanism aimed at restoring the microcirculatory bed, contributing to the improvement of reparative processes in the mucous membrane and accelerating the epithelialization of ulcerative defects in patients.

At the same time, an excessive increase in VEGF, especially against the background of atrophy, inflammation of the mucous membrane and *H. pylori* infection, can accelerate the processes of neoangiogenesis.

Thus, in severely burned patients with gastroduodenal bleeding, the observed increase in the amount of vasculoendothelial growth factor depends on the severity of bleeding and infection with *H. pylori*, and is diagnostically valuable.

The criterion for the effectiveness of the therapeutic effect produced with EFGDS is the achievement of final hemostasis, that is, the absence of recurrence of hemorrhage. Recurrence of acute gastroduodenal ulcerative bleeding in severely burned patients occurred in 8 patients out of 52 (15.4% of the number of patients with endoscopic hemostasis).

With argonoplasmic coagulation, bleeding recurrence occurred in 13.7% of cases; after injection hemostasis in 24% of cases; after radio wave hemostasis in 23% of cases ($p > 0,05$).

So, we found out that argonoplasma coagulation is a more effective method of hemostasis for bleeding from acute stress gastroduodenal ulcers in severely burned patients than injection and radio wave hemostasis. The criterion for the effectiveness of the therapeutic effect of antisecretory drugs in acute gastroduodenal ulcerative bleeding was the absence of recurrence of hemorrhage and the state of stable hemostasis. In the main group, against the background of antisecretory therapy, bleeding recurrence occurred in 5 (11.9%) patients, and in the control group in 8 (22.2%) patients.

Thus, stable hemostasis during bleeding from acute gastroduodenal ulcers in severely burned patients was achieved in the control group against the background of antisecretory therapy with H₂-receptor blockers only in 77.8% of cases, in the main group against the background of antisecretory treatments and with the addition of dopamine D₂-receptor blockers (domperidone) and L-arginine, stable hemostasis was achieved in 88.1% of cases. The dopamine D₂ receptor blocker (domperidone) has a protective effect on the mucous membranes of the gastroduodenal zones and a positive regulatory effect on the tone and contractile activity of the gastrointestinal tract. Thus, the motor-evacuation functions of the gastroduodenal zones are quickly restored.

The results of numerous studies in recent years, conducted in compliance with the principles of evidence-based medicine, indicate the possibility of effective and safe use of L-arginine in clinical practice in various pathologies, including diseases of the gastrointestinal tract.

Analysis of the results of the use of antisecretory drugs with the addition of dopamine D₂-receptor blockers (domperidone) and L-arginine in terms of ensuring stable hemostasis shows that it is the most effective in bleeding from acute ulcers in severely burned ($p > 0,05$).

CONCLUSIONS

1. The development of acute gastroduodenal ulcers complicated by bleeding in severely burned patients is severe organ dysfunction and a high tendency to severity of the patient's condition (27.5%). The cause of death in patients with bleeding from gastroduodenal ulcers in 72.7% of cases was multiple organ failure in severely burned.
2. It has been established that the clinical manifestations of gastroduodenal bleeding in severely burned patients depend on the condition and duration of the preulcerogenic area, the nature of erosions, the depth and size of the ulcer, the course of epithelialization and functional changes (deformities and motility) in the gastroduodenal area.
3. The risk of developing gastroduodenal erosive and ulcerative complications, including gastroduodenal bleeding, increases with an increase in the total area of the burn lesion, especially with an area of more than 40% p.t. In this regard, it is necessary to perform EFGDS upon admission to the hospital of patients with burns of more than 40% p.t., which allows timely detection of erosive and ulcerative lesions from the gastrointestinal tract, to begin their treatment and prevention of gastroduodenal bleeding.
4. In severely burned patients with gastroduodenal bleeding, the observed increase in the amount of vasoendothelial growth factor depends on the severity of bleeding and infection with *H. pylori*, and is diagnostically valuable.
5. When preventing the occurrence of acute gastroduodenal erosions and ulcers in severely burned patients, the risk of their formation decreases, as well as the likelihood of bleeding.
6. Argonoplasma coagulation is the most effective method of hemostasis for bleeding from gastroduodenal ulcers, compared with injection and radio wave methods.
7. Stable hemostasis in bleeding from acute gastroduodenal ulcers in severely burned patients was achieved against the background of antisecretory therapy with H₂-receptor blockers only in 77.8% of cases, and stable hemostasis was achieved against the background of antisecretory treatment with the addition of dopamine D₂-receptor blockers (domperidone) and L-arginine in 88.1% of cases. The operation of choice for bleeding from stressful gastroduodenal ulcers in severely burned patients is organ-preserving interventions.

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