

Endoscopic Approach to the Diagnosis and Treatment of Erosive-Ulcerative Infections in the Gastrointestines in Burns

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Abstract Relevance. According to the latest data from the World Health Organization (WHO), 11-12 million people suffer from burns annually. About half of them, about 6-7 million, require inpatient treatment, more than 200 thousand victims die due to severe complications and consequences of burns. **Objective of the study:** Assessment of the effectiveness of endoscopic examination and treatment in the early diagnosis, treatment, and prevention of complications of diseases (erosions, ulcers, bleeding, and perforations) with functional and organic changes in the mucous membrane of the gastrointestinal tract with severe burns. **Materials and methods.** The study included 105 patients with erosions, ulcers, and bleeding complications of the stomach and duodenum, who were treated in the Combustology department of the Samarkand branch of Republican scientific emergency center in the period from 2022 to 2024. Of these, 82.8% were men and 17.2% were women. **Research results.** Out of 105 patients, 64 patients underwent EGDS once, 20 patients underwent EGDS twice, and 21 patients underwent EGDS 3-5 times. Conclusions and results of single and multiple EGDS. Gastric erosions in 6% patients, duodenal erosions in 8.5% patients, uncomplicated acute and chronic gastric ulcers in 14% patients, duodenal ulcers in 22.1% patients, combined ulcers in 10.4% patients, Complicated bleeding ulcers FIa - 2% patients, Fib - 3.8% patients, FIIa- 4.7% patients, FIIb - 3.8% patients, FIIC - 5.7% patients, FIII - 17.1% patients with the above-mentioned ulcers but without complications, wound perforation in 1.9% patients. **Conclusion.** Timely use of endoscopic examination and treatment of patients with severe burns led to a decrease in the lowest mortality rate associated with pathologies in the gastrointestinal tract and their severe complications from 38% to 19.2%. The time taken to eliminate complications associated with the gastrointestinal tract was reduced from 3 to 1.5 days in the early period and from 7 to 5 days in the late period.

Keywords Severe burns, Gastrointestinal tract, EGDS, Erosion, Ulcers, Bleeding, Perforation

1. Relevance

According to the latest data from the World Health Organization (WHO), 11-12 million people suffer from burns annually [1,2,3,4]. About half of them, about 6-7 million, require inpatient treatment, more than 200 thousand victims die due to severe complications and consequences of burns [5,6,7]. In Uzbekistan, approximately 12-15 thousand people suffer from burn disease annually [8]. Changes in the gastrointestinal tract in burn disease are directly related to

the stage and severity of the disease, and in 3rd-4th degree burns, gastrointestinal dysfunction (perforation, bleeding and septic complications) increases the occurrence, and the combination of these changes worsens the course of the disease, increasing the risk of complications and mortality to 15-25% [9,10,11,12]. Acute lesions and dysfunctional changes in the gastrointestinal tract are detected in 0.2-1.8% of total losses, but in the group of severe burns, these indicators increase by 2.5-3 times. According to endoscopic examination results, acute erosions and ulcers of the gastrointestinal tract in patients with extensive and deep burns are detected in 25-80% of cases, of which 20-25% are complicated by bleeding [13,14,15].

Objective of the study: Assessment of the effectiveness of endoscopic examination and treatment in the early

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diagnosis, treatment, and prevention of complications of diseases (erosions, ulcers, bleeding, and perforations) with functional and organic changes in the mucous membrane of the gastrointestinal tract with severe burns.

2. Materials and Methods

The study included 105 patients with erosions, ulcers, and bleeding complications of the stomach and duodenum, who were treated in the Combustology department of the Samarkand branch of Republican scientific emergency center in the period from 2022 to 2024. Of these, 87 (82.8%) were men and 18 (17.2%) were women. The age of the patients ranged from 18 to 75 years, the average age was 45 years. Depending on the width and depth of the burn site, it was divided into two groups. In the first group, 72 (68.5%) victims with a frequency of 15-25%, in the second group - 33 (31.4%) victims with a frequency of 30-50%.

For endoscopic diagnosis of the gastrointestinal tract and individual assessment of the intensity of bleeding, the classification proposed by J.A. Forrest in 1974 was used (Fig. 1).

- Ia - pulsating arterial hemorrhage
- Ib - bleeding seeping under a blood clot
- IIa - visible blood vessel at the bottom of the wound
- IIb - blood clot firmly attached to the wound bottom
- IIc - flat hematin at the base of the ulcer
- III - absence of signs of bleeding

All patients with suspected gastroduodenal bleeding, along with intensive therapy and conservative ulcer treatment after hospitalization, underwent the first diagnostic and therapeutic EGDS in the first 3-6 hours, as well as EGDS examination for dynamic observation and in the presence of signs of recurrence on days 2-5-7-10-14. This process was performed using the standard method under local anesthesia with a 10% lidocaine solution, intravenous anesthesia, or general anesthesia through an endotracheal tube. Based on the EGDS conclusion, our patients received intravenous and intramuscular hemostatic therapy (Sol. Ethamsylate (Dicynoni) 12.5%, Sol. Aminocaproic Acid 5%, Sol. Vikasol 1% solutions were used individually. According to the recommendations of the European Association of Gastroenterologists **Maastricht**, a first-line scheme was used for the eradication of *Helicobacter pylori* and conservative treatment (quadrotherapy).

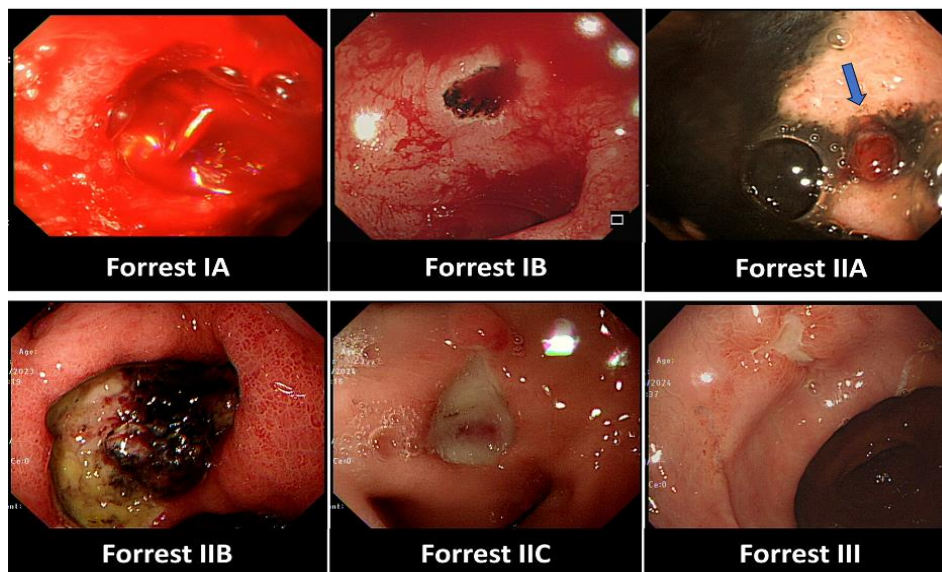


Figure 1. Forrest classification endoscopic picture of bleeding intensity

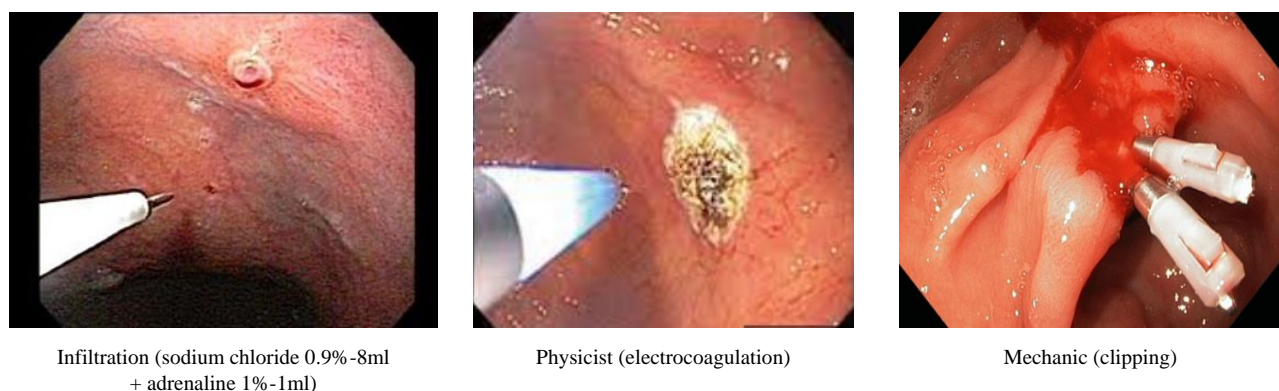


Figure 2. Types and photo of endoscopic hemostasis

Anti-Helicobacter therapy regimen:

- 1) Proton pump inhibitors (Pariet, Omeprazole 20 mg, 2 times a day) + Amoxicillin (1000 mg, 2 times a day) + Clarithromycin (500 mg, 2 times a day) times);
- 2) Proton pump inhibitors (Pariet, Omeprazole 20 mg, 2 times a day) + Metronidazole (500 mg, 2 times a day) + Clarithromycin (500 mg, 2 times a day) times).

Three main methods of endoscopic hemostasis (infiltration, i.e., medicinal, physical, and mechanical) were used (Fig. 2).

3. Research Results

Table 1. Results of the first and repeated endoscopic examination of the gastrointestinal tract

Indicator	Number of patients	Percentage
Total patients	105.	100.0
Single EGDS	64.	61.0
Double EGDS	20.	19.0
EGDS 3-5 times	21.	20.0
Erosions of stomach	6.	6.0
erosion of duodenum	9.	8.5.
Gastric ulcers (uncomplicated)	15.	14.0
duodenal ulcers	23.	22.1.
Joint ulcers	11.	10.4.
Bleeding wounds FIa	2.	2.0
Bleeding wounds FIb	4.	3.8.
Bleeding wounds FIIa	5.	4.7.
Bleeding wounds FIIb	4.	3.8.
Bleeding wounds FIIC	6.	5.7.
Ulcer (FIII - uncomplicated)	18.	17.1.
Wound perforation	2.	1.9.

Out of 105 patients, 64 patients underwent EGDS once, 20 patients underwent EGDS twice (for suspected bleeding and for monitoring in dynamics), and 21 patients (with bleeding complications) underwent EGDS 3-5 times. Conclusions and results of single and multiple EGDS. Gastric erosions in 6 (6%) patients, duodenal erosions in 9 (8.5%) patients,

uncomplicated acute and chronic gastric ulcers in 15 (14%) patients, duodenal ulcers in 23 (22.1%) patients, combined ulcers in 11 (10.4%) patients, Complicated bleeding ulcers FIa-2 (2%) patients, FIb-4 (3.8%) patients, FIIa-5 (4.7%) patients, FIIb-4 (3.8%) patients, FIIC-6 (5.7%) patients, FIII - 18 (17.1%) patients with the above-mentioned ulcers but without complications, wound perforation in 2 (1.9%) patients (Table 1).

The majority of the victims were 64 patients who underwent single EGDS and 8 patients who underwent double EGDS in the 1st group (15-25% of the width and depth of the burn area). 18 patients with repeated EGDS, 21 with complications (bleeding), and 2 patients with perforation were in the 2nd group (30-50% of the width and depth of the burn area).

In 64 patients who underwent single EGDS and 20 patients who underwent double EGDS, erosive changes and uncomplicated ulcers of various sizes in the stomach and duodenum were detected, and according to the above-mentioned Maastricht recommendations, treatment was carried out on a standard basis using the first-line scheme for the eradication of *Helicobacter pylori* and conservative treatment (quadrotherapy), as a result of which a complete positive result was achieved in eliminating pathologies related to the gastrointestinal tract in all our patients. In 21 patients with bleeding complications, infiltration (sodium chloride 0.9%-8ml + adrenaline 1%-1ml), physical electrocoagulation, mechanical (clipping) and combined (infiltration, physical and mechanical) methods of endoscopic hemostasis were used in combination depending on the intensity of bleeding, conservative treatment was also carried out for the purpose of complex treatment, and a complete positive result was achieved. Two patients with wound perforation underwent minimally invasive laparoscopic wound suturing.

Treatment of bleeding from erosions and ulcers of the gastrointestinal tract in burn patients was aimed at 3 main goals (hemostasis, prevention of recurrent bleeding, elimination of the consequences of acute blood loss). As indicated, repeated and periodic diagnostic and therapeutic EGDS was performed, which continued until the complete disappearance of endoscopic signs of active bleeding in erosions and ulcers (Fig. 3).

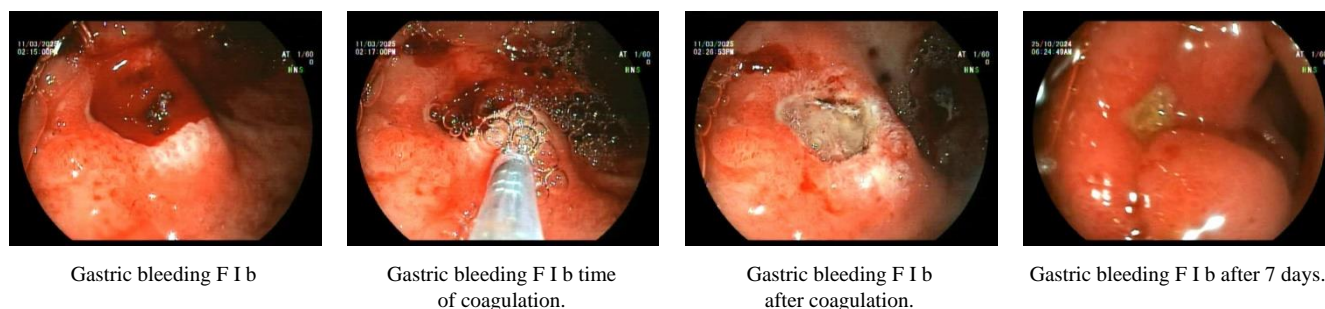


Figure 3. Image and effect of endoscopic hemostasis

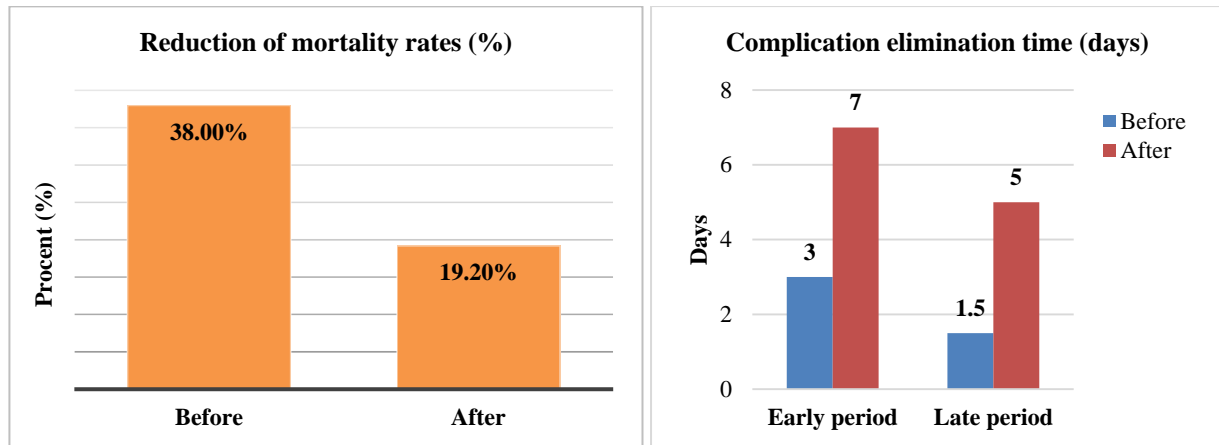


Figure 4. Effectiveness of the endoscopic approach in the elimination of pathologies in the gastrointestinal tract

4. Discussion of Results

Diseases (erosions and ulcers, perforations) of the gastrointestinal tract in patients with severe burns, accompanied by organic changes in the mucous membrane, are one of the urgent and complex problems of medicine, and acute gastroduodenal erosions and ulcers are etiopathogenetically associated with the use of ulcerative drugs and psycho-emotional stress observed in burn disease. Disruption of local blood circulation contributes to the development of hypoxia and reduces the resistance of the gastroduodenal mucosa to acid-peptic aggression. In the last decade, acute gastroduodenal erosions and ulcers have become the leading cause of gastrointestinal bleeding in patients with severe burns [3-6].

Prophylactic EGDS, continuous prophylactic use of gastric secretion blockers, antacids, and cytoprotective agents are used from the first hours after the patient's admission.

The results of the study show that in the acute period of burn disease, effective elimination of hemodynamic disorders, fluid and protein balance reduces the risk of dysproteinemia and intoxication, which leads to trophic disorders of the gastrointestinal tract wall. It is very important to ensure adequate perfusion of organs to prevent the development of acute ulcers and bleeding [4-5].

Our studies have shown that the endoscopic approach in the early prevention and treatment of complications (acute gastroduodenal erosions and ulcers, bleeding, perforation) that develop in patients in the early period within the first 24-48 hours and in the late 3-5 days allows in 70-80% of cases to prevent severe complications associated with the gastrointestinal tract and reduce the number of deaths [10-12]. Using new endoscopic diagnostic and treatment techniques in patients with gastrointestinal dysfunction (acute gastroduodenal erosions and ulcers, bleeding, perforation), especially when active bleeding is detected, allows for immediate endoscopic hemostasis to achieve 90-95% positive results and effectiveness. As a result, the lowest mortality rate associated with this complication decreased from 38% to 19.2%. A positive result was achieved by reducing the time

taken to eliminate these complications from 3 to 1.5 days in the early period and from 7 to 5 days in the late period (fig 4).

5. Conclusions

1. The endoscopic approach plays an important role in the early prevention, treatment, and prevention of severe complications of pathologies in the gastrointestinal tract in patients with severe burns.
2. Timely use of endoscopic examination and treatment of patients with severe burns led to a decrease in the lowest mortality rate associated with pathologies in the gastrointestinal tract and their severe complications from 38% to 19.2%.
3. The time taken to eliminate complications associated with the gastrointestinal tract was reduced from 3 to 1.5 days in the early period and from 7 to 5 days in the late period.

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Conflicts of interest. The authors have no conflicts of interest.

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