

IMPROVEMENT OF METHODS OF ENDOSCOPIC HEMOSTASIS IN MALLORY-WEISS SYNDROME

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Abstract. For clinical surgery, the method of endoscopic hemostasis in Malory-Weiss syndrome has been improved, characterized by a prolonged hemostatic effect, increased local anti-inflammatory and regenerative processes. It has been proven that the injection of Hemoben gel into the submucosal layer of the stomach forms a roller that seals the rupture zone, preventing the possible risk of perforation of the stomach wall and esophagus, and also accelerates the healing process of the wound. The resorption of the latter occurs without the participation of cellular factors of immunity and inflammatory reaction, and the effect has a prolonged effect (for 2-3 days).

Keywords: Mallory-Weiss syndrome; endoscopic hemostasis; ruptures of the esophageal mucosa; hemostatic efficiency.

The relevance of the problem. Mallory-Weiss syndrome is a linear rupture of the mucous membrane in the area of the gastro-esophageal junction. The mechanism underlying the development of mucosal lesions probably involves inconsistency between increased intragastric pressure and closure of the lower esophageal sphincter during episodes of vomiting. As a consequence, the mucous layer undergoes ischemia and eventually ruptures [1, 2]. In most cases, Mallory-Weiss syndrome is treated conservatively, but in 14-30% of cases it is ineffective and these patients require endoscopic treatment [3]. This pathology, if endoscopic manipulations are unsuccessful, may require even open surgical treatment. In a prospective study in 5 countries (Great Britain, USA, Denmark, Singapore and New Zealand), it was shown that 41% of patients with Mallory-Weiss syndrome underwent endoscopic treatment, while repeated bleeding (up to 7 days) developed in 4.9%. Of this number of patients, when using adrenaline pricking, relapse occurred in 4% of patients, with endoscopic clipping in 25%, and with a combination of adrenaline and clipping in 10%. Performing diathermocoagulation led to relapses in 7% of cases, with combined treatment, repeated bleeding developed in 8% of patients. Accordingly, if repeated endoscopic interventions were ineffective, 0.8% of patients were subject to surgical treatment. Even with high hemostatic efficacy, the 30-day mortality in Mallory-Weiss syndrome was 5.7% [4]. Risk factors for recurrent bleeding and mortality in patients with Mallory-Weiss syndrome are the presence of shock upon admission and active bleeding during endoscopy [5, 6, 7, 8]. The frequency of recurrent bleeding in various endoscopic treatment options can range from 0 to 25% and on average ranges from 5-10% [9, 10].

Despite significant progress in the treatment of Mallory-Weiss syndrome, there are still controversial issues of choosing the method of endoscopic intervention, therefore, the search for new and modernization of already known methods of stopping bleeding by combined

exposure to the defect area of various methods of endoscopic hemostasis with the parallel use of general measures of hemostatic, antisecretory, blood-substituting action continues. Also important are the issues of combining endoscopic hemostasis with increased reparative activity on the part of mucosal tear in the cardio-esophageal transition zone.

Materials and methods of research. A clinical group was formed to investigate and evaluate the effectiveness of the proposed method of endoscopic bleeding arrest and treatment for Mallory-Weiss syndrome. The study included 57 patients with Mallory-Weiss syndrome complicated by bleeding, and the bleeding activity corresponded to ongoing bleeding – according to the classification of Forrest (1974) I a and b degrees, or stopped - Forrest II a and b degrees. All patients underwent endoscopic manipulations to stop bleeding on the basis of the Khorezm branch of the Republican Scientific Center for Emergency Medical Care for the period from 2022 to April 2023.

Results and discussion. The article is devoted to the presentation of the technical aspects of the new method. The objective of the present invention is to increase the effectiveness of endoscopic bleeding arrest in ruptures of the esophageal and gastric mucosa by providing a long-lasting effect and sealing ruptures of the esophageal-gastric junction mucosa.

To implement the described method, a domestic bioabsorbable surgical hemostatic agent was used from a composite polymer material from cotton cellulose derivatives "HEMOBEN", developed at the State Institution "Republican Specialized Scientific and Practical Medical Center for Surgery named after academician V.Vakhidov", for which the patent "Bioabsorbable surgical hemostatic agent" of the Intellectual Property Agency of the Republic of Uzbekistan (IAP 05906 of 04/24/2015) was obtained. Local production and the low price of the drug ensures its availability for medical and preventive institutions and for a wide segment of the population.

The domestic bioabsorbable agent "HEMOBEN" has the ability to quickly stop bleeding, high biocompatibility, easily decomposes and has a positive effect on wound healing, accelerating the healing and restoration of the mucosa, improves the regenerative and drainage functions of the tracheobronchial tree.

Domestic bioabsorbable agent "HEMOBEN" is a composition containing Na-carboxymethylcellulose, oxidized viscose, oxidized cellulose, calcium chloride in the ratio, wt%, respectively: 46,5%, 10,5%, 19,0%, 24,0%.

Na-carboxymethylcellulose is a hydrophilic component, has increased adhesion to tissues. It dissolves quickly in water and physiological fluids. Bio-dissolution within 1 day.

Viscose is an artificial polymer of cellulose, characterized in that it has the ability of biodegradation, whereas cellulose is practically not destroyed in the body. This ensures a prolonged effect of the wound coating.

Oxidized cellulose is a hydrophilic component of the drug. It has a hemostatic property. In aqueous solutions, it takes a dispersed form. Biodegradation in 2-3 weeks.

Ca⁺ - ions are a powerful factor of hemostasis, provide rapid hemostasis by forming a blood clot.

Hemobene is obtained by mixing powdered components in the claimed proportions, sterilization and freeze-drying.

To implement the described method, an endoscopic flexible general-purpose injector Interject M00518261 (M00518261) was used - <https://ggrup.ru/inektor-endoskopicheskij-interject-m00518261-5-shtup>.

Appointment: Needles for injection of a drug for the treatment of varicose veins both in the esophagus and in the stomach or intestine, for endoscopic sclerotherapy, as well as ordinary ordinary injections.

The method is performed as follows:

After local anesthesia of the oropharynx with 10% lidocaine solution, the diagnostic stage of endoscopic examination is performed, while the contents of the stomach are sanitized for a clear visualization of the source of bleeding.

After removing the gastric contents and identifying the source of bleeding – acute deep linear ruptures of the mucous membrane of the abdominal esophagus and (or) the cardiac stomach (Mallory-Weiss syndrome), bleeding is stopped by injecting a powdered Hemoben gel in saline solution by means of an endoscopic needle injector. To obtain this Hemoben gel, 1.0 g of sterile hemostatic Hemoben powder and 50 ml of 0.9% NaCl solution are mixed in a sterile vial with exposure for 1 minute (while the powder is placed in a liquid, and not vice versa) (Fig. 1). Then 2-3 ml of gel is injected into the submucosal layer on both sides of the rupture of the mucous membrane at one point (note: the point is each side of the rupture of the mucous membrane, that is, there are 2 points per gap – on the right and left, for submucosal injections of Hemobene gel) with the formation of a roller that stops bleeding, seals the rupture zone and, due to prolonged action (for 2-3 days), helps to reduce the intensity of the inflammatory process characteristic of the aggressive (acidic) environment of the stomach, as well as local enhancement of regenerative processes. Hemostasis is completed by leaving a thin probe for control.

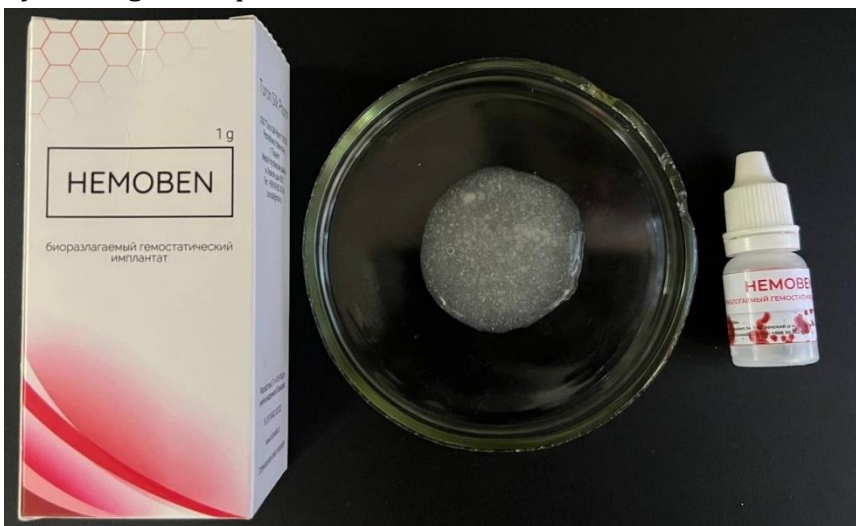


Fig. 1. Prepared gel with Hemoben powder

The process of mixing the powdered composition with saline solution should be carried out carefully, shaking periodically, until a gel without sediment is obtained.

Studies in the experiment and in the clinic allowed us to state the almost instant hemostatic effect of the Hemoben gel used.

Advantages of the method:

- Hemoben is a sterile, certified, biocompatible, bioassailable highly effective hemostatic derived from cellulose derivatives;

- The resorption of hemostatic occurs without the participation of cellular immunity factors without an inflammatory reaction and has a prolonged effect for 2-3 days;
- The introduction of gel into the submucosal layer of the stomach forms a mucosal roller that seals the rupture zone, preventing the possible risk of perforation of the stomach wall and esophagus and thereby accelerates the healing process of the wound.

Note: Hemoben gel in saline is prepared directly during the manipulation, with an exposure of no more than 1 minute, since a long exposure leads to thickening of the gel.

A clinical example.

Patient M. is 51 years old.

Date of admission: February 11, 2023.

Diagnosis: Acute pancreatitis of alimentary genesis. Mallory-Weiss syndrome, complicated by active bleeding.

Complaints at admission of sharp pain in the epigastrium, vomiting of blood, general weakness, dizziness, palpitations.

The history of the present disease: He considers himself a patient since 10.02.23, when, after alcohol abuse, uncontrollable vomiting developed, which within 30 minutes became mixed with fresh blood, followed by an increase in general weakness, dizziness and pain of an indefinite nature in the epigastric region. About what he turned to the consultative polyclinic and was hospitalized in an emergency.

The general condition at admission of moderate severity, the patient's position is active, consciousness is clear, the physique is correct, of the normosthenic type. The skin is pale. The mucous membranes are pale pink in color. Lymph nodes are not palpated. The musculature is developed normally, the muscle tone is normal, the muscles are painless. The bones are not deformed. The configuration of the joints is normal. Nasal breathing is free. No asymmetry of the chest was detected. The number of breathing movements is 18 per minute. During auscultation of the lungs, vesicular respiration is observed. Wheezing, noises, pleural friction noise and splashing noise are absent. The heart rhythm is correct. The tones are muted. Heart rate is 110 beats per minute. Blood pressure is 90/60 mmHg. The tongue is wet. The mucous membranes are pale pink in color. The stomach participates in the act of breathing, is symmetrical. With superficial palpation, soreness in the epigastric region is noted. There is no ascites. On palpation, the liver is not enlarged. Diuresis is not broken. Body mass index 27.

Total blood count from erythrocytes $2.6 \cdot 10^{12}$, hemoglobin 74 g/l, color index 0.96, leukocytes $11.4 \cdot 10^9$, eosinophils 1%, segmented neutrophils 69%, lymphocytes 26%, monocytes 5%, erythrocyte sedimentation rate 12 mm/h. Biochemical blood test: total bilirubin 27.0 mmol / l, blood amylase – 356 units, other indicators are normal. ECG: sinus rhythm, normal position of the electrical axis of the heart, heart rate-106 beats per minute. There are no pathological teeth. Conclusion: sinus tachycardia.

EGDFS with a twofold increase in optics. There is an abundant amount of fresh blood in the stomach with an admixture of food. After the sanitation of the stomach cavity in the cardioesophageal zone, two deep linear ruptures of the mucous membrane with active blood leakage, Forrest 2 a, erosive hemorrhagic gastritis are noted. An injection of gel obtained by mixing 1 g of hemostatic Hemoben powder with 50 ml of 0.9% NaCl solution with exposure for 1 minute was performed into the submucosal layer on both sides of the mucosal ruptures, 2 ml of gel at one point with the formation of a roller (2 ruptures were punctured, 2 points for



each rupture, 8 ml was used gel). After that, a nasogastric probe was installed to monitor hemostasis (Fig. 2-5).



Fig. 2. Type of linear rupture of the mucosa of the cardioesophageal junction



Fig. 3. The process of submucosal administration of Hemoben gel

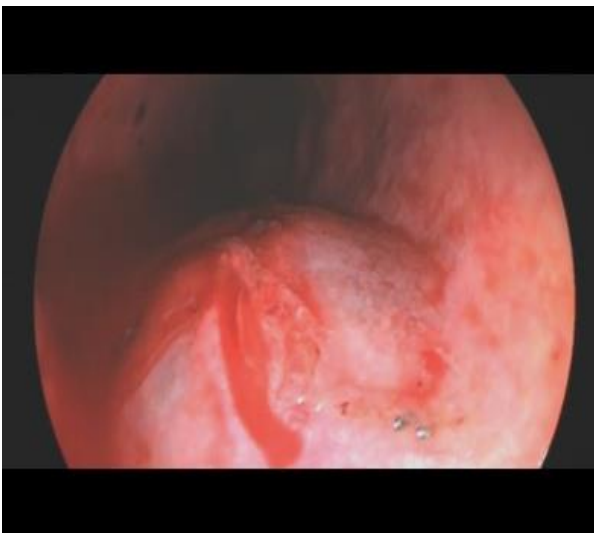


Fig. 4. View after submucosal administration of Hemoben gel

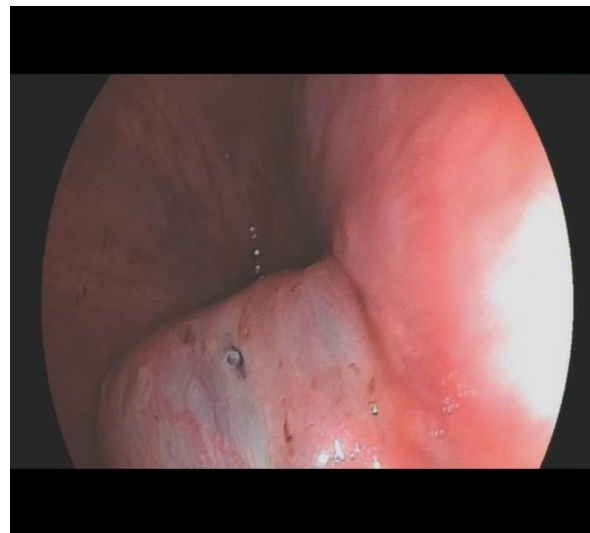


Fig. 5. View of the injection site 2 days after manipulation

The patient took conservative anti-ulcer, anti-pancreatic therapy, the probe was removed after a day, the discharge from the probe was without blood admixture, with control EGDS after 3 days, complete repair of mucosal ruptures was noted.

The patient was discharged in satisfactory condition on February 15, 2023. Recommended: continuation of therapy.

For this method, an invention patent was obtained from the Ministry of Justice of the Republic of Uzbekistan No. IAP 07368 "Method for stopping bleeding and treating ruptures of the mucous membrane of the cardioesophageal zone of the stomach" (Sadykov R.A., Babadjanov A.K., Yakubov F.R., Erniyazov E.A., Sapaev D.S., Djumaniyazov D.A.) dated April 14, 2023.

Thus, a method has been developed for endoscopic stopping of bleeding during ruptures of the mucous membrane of the cardioesophageal zone, which increases the effectiveness of

hemostasis by providing a long-lasting effect and sealing the defect, while the formation of a roller in the submucosal layer prevents the possible risk of perforation of the organ wall in the injection area, and also accelerates the healing processes of the wound.

Conclusion. For clinical surgery, the method of endoscopic stopping of bleeding and treatment of ruptures of the mucous membrane of the cardioesophageal zone of the stomach, characterized by a prolonged hemostatic effect, increased local anti-inflammatory and regenerative processes, has been improved.

Studies have shown that the injection of Hemoben gel into the submucosal layer of the stomach forms a roller that seals the rupture zone, preventing the possible risk of perforation of the stomach wall and esophagus, and also accelerates the healing process of the wound. It was also found that with the submucosal administration of the gel composition of the hemostatic agent Hemoben, the resorption of the latter occurs without the participation of cellular immunity factors and an inflammatory reaction, and the effect has a prolonged effect (for 2-3 days).

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