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PRE-ROTATION OF SUTURE FAILURE DURING SUTURING OF PERFORATED GASTRIC AND DUODENAL ULCERS.

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Abstract:

Research objective: Improving the reliability of tightness of sutures when suturing perforated gastric and duodenal ulcers in conditions of widespread peritonitis by improving the method of preventing suture failure.

Materials and methods: The results of surgical treatment of 106 clinical cases of suturing a perforated gastroduodenal ulcer complicated by widespread peritonitis were analyzed. The patients were divided into two groups: the main group (n = 34), which used the proposed method for preventing suture failure-nitric oxide in the gas stream, which also includes local rehabilitation of the ulcer defect zone, isolating reinforcement with sero-muscular sutures with additional fixation by omentum grafting and temporary decompression of the stomach; and the control group (n = 72), where the traditional suturing techniquewas used.

Research results: After 1 session of treatment with nitric oxide air flow, a change in the structure of the bacterium is noted, which is expressed in a violation of the integrity of the membrane. By the end of 2 days, complete destruction of H.Pylori is observed with the formation of a dense mass of destroyed bacteria

Conclusion: the flow of nitric oxide is an effective method of preventing suture failure after suturing the perforation of ulcers.

Keywords: Perforated Ulcer, Suturing Of Perforation, Nitric Oxide

INTRODUCTION. Today, perforated gastric and duodenal ulcers remain one of the most important problems of emergency abdominal surgery, which is of great medical and social significance [7]. This pathology affects 2-10% of the population of economically developed countries [2]. Treatment of patients with perforated gastroduodenal ulcer should include early diagnosis and prompt resuscitation [8]. Perforation of gastroduodenal ulcers is a serious complication that directly threatens the patient's life, due to the development of peritonitis, and requires immediate surgical treatment. The incidence of perforated gastroduodenal ulcer in the world is 3.8-10 per 100 000 population [7]. Mortality after surgery varies from 15.5 to 31% [1,7].

Perforated gastroduodenal ulcer (PGD) remains one of the most frequent and dangerous forms of complicated gastric and duodenal ulcers, accounting for 5 to 10% of all peptic ulcer cases and up to 15% of all acute surgical diseases of the abdominal cavity [4, 10]. Despite significant advances in pharmacotherapy and endoscopic diagnosis, the incidence of perforations remains stable, especially in elderly patients and patients taking long-term nonsteroidal anti-inflammatory drugs (NSAIDs) [6].

The development of perforation leads to a rapid spread of peritonitis, accompanied by a pronounced endotoxic reaction, impaired microcirculation and tissue hypoxia, which creates extremely unfavorable conditions for healing the edges of the ulcerative defect. Even with timely surgical intervention, the risk of suture failureremains, the frequency of which, according to the literature, ranges from 3 to 14% and directly depends on the degree of abdominal contamination, the duration of the disease, the size of the perforation, the condition of the tissues and the suturing technique [6, 9].

Failure of sutures in the early postoperative period leads to the formation of repeated perforation, the development of infiltrate, abscesses, diffuse peritonitis, and an increase in mortality, reaching 20-30 % in generalized forms [6]. Therefore, ensuring reliable tightness of sutures in conditions of peritonitis is a key factor in the successful outcome of the operation.

Several areas of prevention have been developed:

- Mechanical methods: use of serous-muscle strengthening sutures, duplicate rows,

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omentum grafting, partially absorbable threads (Vicryl 2/0, PDS II), as well as sutures with minimal травматизациейtissue injury.

- Biological methods: the useofomentoplasty, fibrin glue, collagen membranes, серозыserosa or fascia flaps, which have a pronounced trophic and sealing effect.
- Functional methods: creating conditions for resting sutures due to constant aspiration of gastric contents, probe decompression, and correction of the acid-base balance[3, 5].

In recent years, complex methods that combine local sanitation, suture strengthening and biological protection of the defect with an omentum flap have been actively studied. Pashkin K. P. (2023) etal. suggested using *an enhanced combined technique for suturing perforations* with the formation of a" double barrier": mechanical (sero-muscular sutures) and biological (stuffing box), which reduced the rate of suture failure to 2.8 %, against 13.7% with standard techniques.

OBJECTIVE: To improve the reliability of suture tightness during suturing of perforated gastric and duodenal ulcers in conditions of widespread peritonitis by improving the method of suture failure prevention.

MATERIALS AND METHODS: 106 clinical cases of suturing a perforated gastroduodenal ulcer complicated by diffuse peritonitis were analyzed. The patients were divided into two groups: the main group (n = 34), which used the proposed method for preventing suture failure-nitric oxide in the gas stream, which also includes local rehabilitation of the ulcer defect zone, isolating reinforcement with sero-muscular sutures with additional fixation by omentum grafting and temporary decompression of the stomach; and the control group (n = 72), where the traditional suturing techniquewas used.

RESULTS: We analyzed the results of surgical treatment of 106 clinical cases of suturing of a perforated gastroduodenal ulcer complicated by advanced peritonitis, who were treated inpatient at the clinical bases of the Department of Faculty and Hospital Surgery No. 1 of the Faculty of Medicine of Tashkent State Medical University, Clinic No. 1. The criteria for inclusion in this study werepatients with a clear clinical picture of perforation of a gastric ulcer or duodenal ulcer, confirmed by clinical data (anamnesis, complaints, clinical examination). Laboratory data (general blood and urine analysis) were evaluated. A number of instrumental methods were used: ultrasound of the abdominal organs, which determined the presence of free and delimited fluid in the abdominal cavity; X-ray of the abdominal cavity – the presence of free gas under the dome of the diaphragm; EGDFS examined the condition of the bottom of the ulcer.

The first control group consisted of 72 patients who underwent suturing of a perforated gastric ulcer and duodenal ulcer, including local rehabilitation of the ulcer defect zone, isolating reinforcement with sero-muscular sutures with additional fixation by omentum grafting and temporary decompression of the stomach - a traditional suturing technique. The subhepatic region and small pelvis are drained by two-lumen drainage, which are brought out through the corresponding counterpertures. Of these, 32 patients were operated on for gastric ulcer perforation, 40 patients-for duodenal ulcer perforation. Of the 72 patients, 16 had failure of the perforated gastric ulcer sutures in the early postoperative period, and 11 had failure of the duodenal sutures. There were 19 males and 8 females, and the patients ranged in age from 25 to 65 years. 23 patients of this group underwent repeated surgical interventions for emergency indications.

The second main group consisted of 34 patients with perforated duodenal ulcer, who were treated intraoperatively, after performing the main stage of surgery, through a 5 mm trocar brought to the area of the sutured perforated ulcer, the surgical area is treated under a thin layer of saline solution from a distance of 3-5 cm and an exposure of 7-10 seconds per 1 cm^2, the total treatment time is up to 3 min. The mode of nitric oxide content in the gas stream is 750 ppm.

After performing the main stage of surgical intervention for perforation of an ulcer of 12 pp. k. ., the subhepatic region and small pelvis are drained by double-lumen drainage, which are brought out through appropriate counterpertures. In the postoperative периодинсуфляция, the air flow of nitric oxide is insufflated through this drainage. Exposure time from 2 to 3 minutes. When performing the procedure, you should start with a minimum air flow, then in the absence of unpleasant sensations, you can switch to the normal mode with a nitrogen oxide content of 750 ppm in the gas streamppm. The procedure is performed in the postoperative period for 2-3 days.

The main reasons for the failure of sutures of sutured перфоративныхperforations of gastric and duodenal ulcers, along with the above-mentioned general and local causes, were Hhelicobacter pylori. Despite many ongoing studies on the diagnosis of early postoperative complications in patients with gastric ulcer and 12 pp. c., a large number of errors and unsatisfactory outcomes of surgical treatment cause reasonable concern. The main reason for this, in our opinion, is the lack of optimal prevention after suturing perforated ulcers, which would prevent the failure of the suture after suturing ulcers and reduce the percentage of relaparotomy.

Microbiological studies were performed. General view of H. pylori. It was aspiral-shaped or curved bacterium, 2-4 microns long and 0.5-1 microns wide. It

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has from 1 to 6 flagella located at one pole of the cell, which ensure its mobility. The membrane is smooth (fig. 1).

After 1 session of treatment with nitric oxide air flow, a change in the structure of the bacterium is noted, which is expressed in a violation of the integrity of the membrane (Fig. 2).

By the end of 2 days, complete destruction of H. Pylori is observed with the formation of a dense mass of destroyed bacteria (Fig. 3).

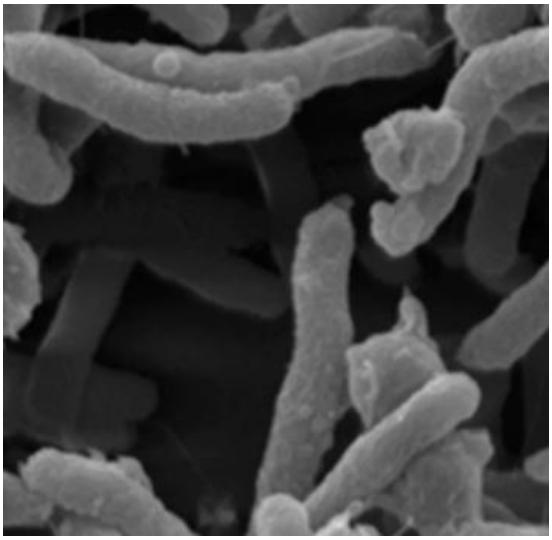
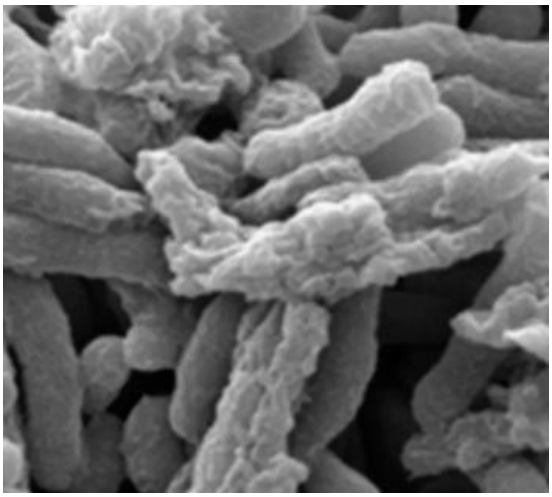


Fig. 1. The original species of H. pylori.



2. H. Pylori species after the first treatment with an air stream of nitric oxide.

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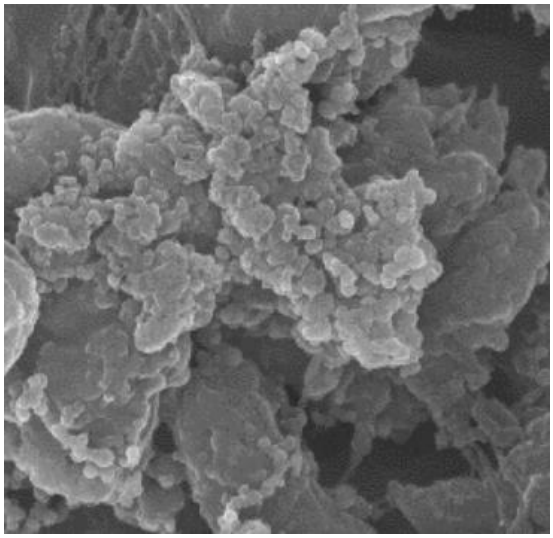

3. H. Pylori species by the end of the second day after treatment with an air stream of nitric oxide.

Clinical example No. 1 using the developed method for preventing suture failure when suturing a perforated gastroduodenal ulcer in conditions of peritonitis

Patient K., 35 years old (eastbol. № 4327) was admitted to the clinic on 02.04.2023. with complaints of sharp severe epigastric pain, nausea, vomiting.

From the anamnesis: 4 hours before going to the clinic, the patient suddenly has sharp pain in the epigastric region against the background of complete well-being.

The general condition of the patient at admission is moderate, consciousness is clear. Skin and visible mucous membranes of normal color. The situation is forced. The peripheral lymph nodes are not enlarged. Vesicular respiration occurs in the lungs. The heart sounds are clear and rhythmic. Blood pressure 130/70 mm. p. t. st. Pulse 96 beats/min. Locally: The tongue is moist and clean. The abdomen is palpationally "plank-like" in consistency, painful in all parts. Symptoms of peritoneal irritation are positive. Intestinal motility is not listened to. Stool and diuresis are regular.

In blood tests: General blood analysis: hemoglobin-106 g / l, red blood cells-4.0 x^{10-12}/l, color index-0.9, platelets-210 x^{109}/l, white blood cells-11.2 x^{109}/l, ESR-5 mm / h. Biochemical blood tests: ALT – 0.4 mmol/ l, AST-0.3 mmol/L, bilirubin-16.0 mmol/L, urea-6.5 mmol/L, creatinine-72 mmol/l, total protein-62 g/l, fibrinogen-240 mg%, ethanol test-negative.

On ultrasound: подпеченочномthere is free fluid in the subhepatic space and the right lateral canal in a volume of about 150 ml

The patient was diagnosed with peptic ulcer disease 12 P. K., complicated by perforation, peritonitis.

On 02.04.2025, the patient underwentинтубационным"Laparoscopic suturing of a perforated ulcer 12 p. c. Sanation and drainage of the abdominal cavity" under general intubation anesthesia. ИнтраоперационноIntraoperatively, local sanitation of the abdominal cavity was performed with an air stream of nitric oxide.

The postoperative period was smooth. In the postoperative period, local sanitation with nitric oxide was performed twice a day through drainage in the subhepatic region. Recovery. The patient was prescribed on the 6th day after surgery.

CONCLUSION. Thus, local therapy with nitric oxide air flow is an effective method of preventing suture failure after suturing the perforation of the ulcer 12 pp. k., since it has antimicrobial properties and improves blood circulation in the area of surgical exposure, which improves the results of treatment of patients with complicated forms of peptic ulcer disease.

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