

Minimally Invasive Interventions in Surgery of Perforated Duodenal Ulcers

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Abstract Objective: To improve the results of surgical treatment of patients with perforated duodenal ulcers by a substantiation of indications for laparoscopic and traditional surgical intervention. Material and Methods: The analysis of results of treatment of 212 patients with perforated duodenal ulcer, complicated by diffuse peritonitis, who were hospitalized in the emergency surgery department of 2 - clinic of the Tashkent Medical Academy for the past 8 years. All patients were divided into three clinical groups. Results: 120 patients of first group with perforated ulcer suturing performed by laparotomy access; second A group - 55 patients operation carried out through a mini-access under video-control; second B group - 37 patients underwent laparoscopic suturing of perforated ulcer. Patients who were executed on the testimony of draining the stomach surgery and vagotomy with antrumectomy gastrectomy, in this study are not included. Complications in all groups were largely associated with traumatic laparotomy access: in the first group in 18 (16.1%) patients, of whom 11 (9.2%) were observed wound complications; and in the second A group in 2 (3.6%) patients in the second B group 1 (2.7%) patients had complications such as surgical wound seroma, early adhesive intestinal obstruction and intestinal paresis. Conclusion: Today, in the presence of the indications for suturing perforated ulcers and ulcer healing predicted the substrate, the optimal methods are minimally invasive surgery with the conduct of a comprehensive anti-ulcer therapy in the postoperative period.

Keywords Peptic ulcer, Perforation, Laparoscopic suturing

1. Introduction

One of the serious complications of duodenal ulcer (DU) is a perforation, which occupies the first place among the causes of deaths of this disease. According to the Institute of Health and Medical Statistics of the Ministry of Health of the Republic of Uzbekistan and the overall performance of the primary ulcer incidence it declined significantly in recent years. However, currently, the downward trend is not observed frequency of complications. For example, if there is bleeding ulcer in 24.5% cases, the perforation occur in approximately 10% of cases. In 2013, Uzbekistan produced nearly 2,000 emergency operations in patients with perforated gastroduodenal ulcers. This figure in 2014 at above 900 operations than in 2013 [1, 2].

However, it has many complications such as suppuration of postoperative wounds, adhesive disease of the abdominal cavity, the formation of ventral hernias, ligature fistulas, etc. The downside suturing perforated ulcer is the high recurrence rate of peptic ulcer disease, reaching up to 50% [5, 6, 12-15]. Therefore, this surgery as a palliative operation has no effect on ulcer etiopathogenesis, indicated for diffuse

peritonitis in patients with elderly with serious underlying medical conditions.

Currently, due to the emergence of a new generation of drugs with proven ability to significantly accelerate the healing process of gastric ulcer and duodenal defect and to prevent its recurrence, opened up prospects for improving long-term results of treatment of pyloroduodenal perforated ulcer after suturing in young patients [3, 4, 12, 14, 15]. The rapid development of minimally invasive surgery, such as laparoscopic surgery, significantly reduced surgical aggression, mortality and postoperative complications, thereby improving the quality of life of patients in the postoperative period. In this context, it is of particular interest to study the long-term outcomes after laparoscopic duodenal ulcer perforation in the comparative aspect with the traditional method.

Objective: to improve the results of surgical treatment of patients with perforated duodenal ulcers by a substantiation of indications for laparoscopic and traditional surgical intervention.

2. Material and Methods

We conducted an analysis of the results of treatment 212 patients with perforated duodenal ulcer, complicated by diffuse peritonitis, who were hospitalized in the emergency surgery department of 2 - clinic of the Tashkent Medical

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Published online at <http://journal.sapub.org/ajmms>

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Academy for the past 8 years. The men were 158 (74.5%), women - 54 (25.5%). The age of patients ranged from 17 to 86 years, with an average of $36,7 \pm 8,4$ years. Most (84.9%) were persons young and middle age. In the first 12 hours after perforation received 134 (63.2%) patients, from 12 to 24 hours - 57 (26.8%) and days later - 21 (9.9%) patient.

The diagnosis of perforated gastroduodenal ulcer established on the basis of a common integrated diagnostic program. From special methods of investigation, besides abdominal radiography, in 41 (19.3%) cases used EGDFS, and in difficult diagnostic situations - laparoscopy (in second groups).

In 105 (49.5%) patients ulcer history was absent, in 55 (25.9%) - no more than five years. In 137 (64.6%) cases the ulcer was located on the front wall of the duodenal bulb, 50 (23.5%) - on the front-top and in 25 (11.8%) - on the upper wall. All patients were operated on during the first hour after admission to the hospital.

All patients were divided into three clinical groups: first group - 120 patients (laparotomy access (Figure 1) performed suturing perforated ulcer); second A group - 55 patients (operation performed by mini-access under videoassisting control (Figure 2).); second B group - 37 patients (laparoscopic suturing of perforated ulcer (Figure 3).). Patients who were executed on the testimony of draining the stomach surgery and vagotomy with antrectomy gastrectomy, in this study are not included.



Figure 1. Diagnostic error. The scar after appendectomy and midline laparotomy with perforated ulcer duodenum. Perforation was revealed during an appendectomy

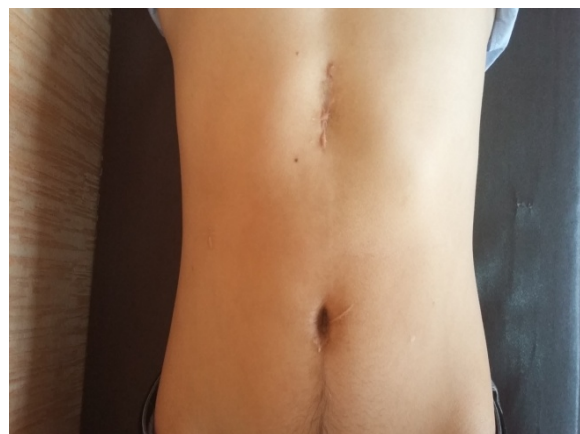


Figure 2. Access after video-assisted suturing perforated ulcer



Figure 3. Area of punctures on the anterior abdominal wall during laparoscopic suturing perforated ulcer (2 and 10 days after surgery)

Table 1. Criteria for selecting the method of repair for perforated ulcers

The method of operation	Punch-hole size	Infiltrating shaft	Type and nature of peritonitis	Condition of intestine
Closure of perforated ulcer by laparotomy access	More than 10 mm	Expressed	When impossible laparoscopic sanitation	Advanced bowel loops
Closure of perforated ulcer by mini access with videoassisting	Before 10 mm	Irrelevant	When possible laparoscopic sanitation	Precipitated bowel loops
Laparoscopic suturing of perforated ulcer	Before 5 mm	No or unexpressed	When possible laparoscopic sanitation	Precipitated bowel loops

3. Results

In most cases, the clinical diagnosis of perforated gastroduodenal ulcer not represent special difficulties. The most authentic and typical signs of the onset of perforation were: sudden onset of acute "dagger" pain in the stomach, followed by the rapid spread of the entire stomach (84.9%), strongest muscle tension of anterior abdominal wall (79.7%), general condition of the patient due to heavy pain shock and intoxication (9.4%).

Errors in diagnosis occurred more often in the pre-hospital as a result of an atypical clinical course of perforation (19 cases). In 7 patients were initially diagnosed acute appendicitis, in 10 - acute pancreatitis, in 2 - an exacerbation of peptic ulcer disease. In hospital under dynamic observation perforated ulcer diagnosis was established in 10 of 19 patients using preoperative endoscopy. In 7 patients the true pathology found only during surgery for acute appendicitis. The remaining 2 patients admitted repeatedly from therapeutic department with symptoms of peritonitis. In our opinion, the holding of an emergency EGDFS indicated in all patients with a suspected perforated duodenal and gastric ulcers.

In the first group for all patients operations were performed laparotomy access. In the second groups surgery began with a diagnostic laparoscopy and evaluated the ability to perform minimally invasive surgery method. Patients who have shown suturing perforated ulcer laparotomy access is not included in the analyzed material. During diagnostic laparoscopy determined the size of the perforated holes, evaluated the severity of infiltrative shaft, the state of the intestine, the type and nature of peritonitis. Depending on the nature of the pathological process in the abdominal cavity was chosen method of surgical treatment of perforated duodenal ulcer (Table 1).

In order to further develop and expand the use of endoscopic operations for perforated ulcers is necessary to clearly define the indications and contraindications for their use. Our experience allowed us to determine the following contraindications to the use of laparoscopy: repeated perforation, scar-ulcerative stenosis, size perforated holes larger than 10 mm, the presence of indications for all-out intubation of the small intestine, the impossibility of rehabilitation abdominal laparoscopic way.

Postoperative period corresponds to the volume of the operation.

In the first group, the negative aspects of treatment were caused not so much the volume of surgical intervention in the abdominal cavity as traumatic laparotomy. In 11 (9.2%) cases marked wound complications; 5 (4.2%) patients developed postoperative intestinal paresis in 2 (1.7%) patients developed acute adhesive intestinal obstruction. Against the backdrop of ongoing conservative measures in one case it was possible to restore the passage by the digestive tract, in the second case it was necessary to resort to repeated surgery. In 1 (0.8%) developed a case of abscess of subphrenic space, which caused the right-hand hydrothorax.

The patient performed percutaneous drainage of the abscess with subsequent sanitation. Hydrothorax eliminated by repeated puncture of the pleural cavity.

Intraoperative complications and mortality were not observed in the second groups. Postoperative complications associated with video-assisted suturing perforated ulcers occurred in 2 (3.6%) cases. In one case developed postoperative wound seroma that required additional treatment measures. The second observation developed early acute intestinal obstruction, which was resolved conservatively.

In the second B group 1 (2.7%) patients in the 3rd postoperative day observed bleeding from the upper gastrointestinal tract. Made endoscopy, which revealed fresh blood clots at the bottom of the ulcer. The patient held conservative therapy, the bleeding stopped. This was probably due to the surface taking the mucosa during laparoscopic suturing perforated ulcer by.

For all observed patients administered anti-ulcer drugs and antibiotics (Omeprazole and Ceftriaxone) during the operation and in early postoperative period. After discharging from hospital all observed patients took anti-ulcer drugs in combination with Clarytromycine or Metronidasole during one month. For long-term study at 6 months in patients of the second groups were not detected ulcer symptoms.

Discussion of the results. For purposes of comparison to the first group included patients undergoing laparotomy suturing access perforated ulcer.

Our own comparative analysis showed that the combination of endoscopic, radiographic and laparoscopic techniques significantly reduce the frequency of diagnostic errors, thereby reducing postoperative complications and mortality, improve patient quality of life. Of particular note is the cosmetic effect of the operation, especially true for females, younger patients and patients with obesity.

Girdaladze A.M. (2010) reports on the dignity of laparoscopic suturing perforated duodenal ulcer with helicobacter prerequisite of testing in the postoperative period and the need for eradication therapy. They observed a relapse of the disease in 6.7% of cases, it did not comply with medical therapy in patients [7]. In our studies of *H. pylori* testing is not performed, but the intraoperative assessment of gastric pH and rapid morphological study of ulcerative substrate for possible prediction of scarring ulcers in the postoperative period allowed in long-term follow up to 2 years to obtain positive results. The incidence of relapse was not observed.

Faisal A. and John G. (2016) believe that the clinical results between minimally invasive and open suturing perforated ulcer is practically no difference. The only positive aspect is the reduced need for analgesics, as well as the ability to perform pyloroplasty, vagotomy or resection of the stomach laparoscopically by the presence of the indications for these interventions. This increases the duration of the operation [8]. Our studies have shown significant advantages of minimally invasive surgery to open

surgery. We have not clinical experience of performing pyloroplasty, vagotomy or gastrectomy laparoscopically.

In the diagnosis of perforation covered with some Russian scientists say the high role of ultrasound diagnosis, the accuracy of which is up to 86% [3-5]. In our opinion, it is a more reliable endoscopy with air insufflation into the lumen of the stomach and duodenum, followed by re-survey fluoroscopy to determine the free gas in the abdominal cavity.

Over the past 10 years in Kenya Andrew G.H. and Fracs M.D. (2001) conducted a study to determine the therapeutic tactics in perforated ulcers and divided the patients into risk groups. Among them, those patients with a high operational risk, were treated conservatively for the Taylor method. Accordingly, the results of a retrospective analysis of a randomized and the latter method was more effective. To estimate the expected mortality following risk factors were included: length of perforation for more than 24 hours, a state of shock (at admission BP <100 mm Hg) and severe comorbidities. In the presence of the above factors before mortality reaches 100% [9]. We believe now, contraindications for surgical treatment of perforated ulcers should not be. In our clinical observation, all patients were subjected to surgical treatment.

In South Korea and China in 2010 was conducted a randomized study to determine the role of eradication therapy after suturing of perforated ulcers. The main parameters considered healing and relapse of ulcer. The study was conducted at two clinical groups: the first - used quadruple, in the second - omeprazole monotherapy. After 2 months in the endoscopy result was almost the same (healing was 82% and 87%, respectively). However, relapse within a year during monotherapy observed several times greater than in patients after quadruple (4.8% and 38.1%) [10-12]. Consequently, the implementation of a comprehensive therapy affects the prognosis and quality of life of patients. We are in all cases prescribed patients a comprehensive therapy aimed at healing of ulcer and eradication of helicobacter substrate.

Thus, today, in the presence of the indications for suturing perforated ulcers and ulcer healing predicted the substrate, the optimal methods are minimally invasive surgery with the conduct of a comprehensive anti-ulcer therapy in the postoperative period.

4. Conclusions

1. Laparoscopic suturing advisable to perform at the perforation of duodenal ulcers with perforated hole till 5 mm and unexpressed infiltrative shaft. Contraindications to laparoscopic suturing is repeated punching, combination of perforated ulcer bleeding, scar-ulcerative stenosis, size perforated holes larger than 10 mm, the presence of indications for all-out intubation of the small intestine, the impossibility of rehabilitation abdominal laparoscopic way.
2. Closure of perforated ulcer through the mini-access using videoassisting should be performed at the perforated hole 10 mm with a pronounced perifocal infiltrate.
3. Closure of perforated ulcers is a palliative method of operation, but in the presence of the indications for suturing perforated ulcers and ulcer healing predicted the substrate, the optimal methods are minimally invasive surgery with the conduct of a comprehensive anti-ulcer therapy in the postoperative period.

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