



## MODERN APPROACHES TO ABDOMINAL DRAINAGE IN DIFFUSE PERITONITIS

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<b>Received:</b> June 1 <sup>st</sup> 2022	A review of domestic and foreign literature is presented, reflecting modern approaches to drainage of the abdominal cavity in generalized peritonitis. The development of new, highly effective methods of sanitation of the abdominal cavity in peritonitis is an urgent task, especially at the present stage of development of medical technologies.
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### RELEVANCE

Despite the introduction of new and improvement of existing methods of surgical treatment, the use of an extensive arsenal of intensive care means, mortality in generalized peritonitis remains at a high level [15].

In recent years, the attention of surgeons has shifted to an in-depth study of the pathogenesis of peritonitis in order to develop effective methods for its treatment [16]. The issue of adequate intra- and postoperative sanitation of the abdominal cavity as the main element of detoxification remains relevant. For this purpose, it is proposed to use various methods: from simple drainage of the abdominal cavity and peritoneal lavage, to laparostomy and programmed relaparotomy. In the treatment of generalized peritonitis, the latter two options are currently preferred. They allow not only to effectively sanitize the abdominal cavity, but also to control the course of peritonitis [9].

At the same time, being quite traumatic interventions, these methods can exacerbate stress disorders, loss of protein and electrolytes, suppress immune defense mechanisms in the postoperative period, and cause a number of severe complications [1, 5].

Sanitation of the abdominal cavity is one of the main components of the complex treatment of common forms of peritonitis. The quality of its implementation in most cases determines the dynamics of the pathological process and the outcome of the disease [2].

Drainage of the abdominal cavity is one of the first methods of rehabilitation, which does not lose its relevance to this day. At present, a large number of various drainage devices have been developed to improve the efficiency of drainage. drainage is carried out using tubes made of rubber or plastic, rubber strips, plastic strips, hydrocellulose film, gauze swabs, soft probes and catheters [15].

At this stage, silicone drains are widely used, which are characterized by flexibility, strength, and most importantly, when they stay in the abdominal cavity for a long time, they do not cause the formation of decubitus ulcers in the intestinal wall. However, in any case, the

effect of drainage is limited by the time interval due to insufficient biological inertness [14].

To increase the effectiveness of the surgical treatment, various types of drainage systems have been introduced into surgical practice. These include tubular, glove-tubular, cigar drains, the use of which is combined with the use of sorbents, antibiotics, and antienzymatic preparations [15].

Considering the very limited period of effective operation of drainages, the best results of their work are noted mainly when setting up at the early stages of the development of peritonitis, when the source that provoked it is completely removed.

When identifying indications for abdominal drainage, it should be borne in mind that the drains, being a foreign body, are covered by adhesions already in the first hours of their installation and subsequently drain only the nearby area of the abdominal cavity [19]. Another disadvantage of drains is the obturation of their lumens with wound discharge [13]. to increase the efficiency of drainages, they are recommended to be washed and mechanically cleaned using special mandrins.

Drainages reduce and suppress the antibacterial and absorbent functions of the peritoneum. the use of rigid drainage with a large diameter creates the conditions for the development of serious complications, such as suppuration of postoperative wounds, the formation of intra-abdominal adhesions, eventration of intestinal loops, omentum, the occurrence of postoperative ventral hernias and intestinal fistulas.

There are two main methods of drainage - active and passive. With passive drainage, the liquid content flows out by gravity through the drain. Despite the great popularity of this method, a large number of studies have been published indicating that it is ineffective at high microbial contamination [12, 19].

Peritoneal dialysis is one of the most advanced methods of passive abdominal drainage. It is based on the idea of continuous prolonged sanitation of the abdominal cavity. When managing patients with complicated forms of peritonitis, two types of peritoneal lavage were most common: flow and fractional dialysis.



Despite the undoubted advantages, this method still has a number of significant disadvantages. Firstly, due to the formation of multiple diffuse adhesions, already within a few hours after the operation (6–12 hours), the solutions injected through the drains cease to fulfill their purpose, flowing down to the dorsal wall and into the small pelvis. Secondly, a violation of the outflow of dialysis fluid not only leads to dissemination of infection in the peritoneum, but can also contribute to the formation of a tense hydroperitoneum and the occurrence of associated circulatory disorders. Thirdly, with intensive flow dialysis, significant losses of proteins and electrolytes cannot be prevented, as a result of which disturbances in the water-electrolyte balance increase, hyperhydration of the tissue may develop [3].

In fractional dialysis, several liters of dialysis solution containing an antiseptic or broad-spectrum antibiotics are injected into the abdominal cavity, and after exposure for an hour, the dialysate is passively evacuated through the drains. However, this method of drainage of the abdominal cavity also has disadvantages: the accumulation of antibacterial drugs, the formation of a tense hydroperitoneum, intra-abdominal abscesses and small intestinal fistulas are possible [18]. In addition, the local administration of antibiotics to the focus of inflammation is very irrational, since most antibacterial drugs are almost completely deactivated in conditions of a disturbed acid-base state of the abdominal cavity, and an undestructed drug contributes to the sensitization of the body and ultimately can provoke the development of anaphylactic reactions.

It is generally accepted that active drainage has a great effect in the process of drainage of the abdominal cavity with peritonitis due to the possibility of using single or double lumen drainage systems. The main advantage of the method is faster and more complete removal of pathological exudate compared to passive drainage. studies have shown that aspiration-flushing drainage prevents the spread of purulent infection, quickly eliminates the clinical symptoms of intoxication [19].

According to experimental data, drainage of the abdominal cavity, regardless of the number of drains and active aspiration, is not always able to provide adequate sanitation. With widespread peritonitis, in almost 80% of cases, within 12–24 hours after laparotomy, the drainage tubes lose their patency [5].

During laparoscopic operations, it is recommended to place drains in the small pelvis to evacuate the residual lavage fluid [19]. According to J.J. Clark, laparoscopic drainage is a safe and effective replacement for laparotomy in intra-abdominal abscesses that may develop after laparoscopic appendectomy [21].

Special attention should be paid to the proposal to use drainage tubes during laparotomies in order to carry out ultrasonic or endoscopic sanitation of the abdominal cavity through them [9]. other authors consider drainage

with a double-lumen tube with aspiration through a wide channel as a more advanced method with fractional or permanent sanitation of the microchannel, which makes it possible to remove exudate with a tightly sutured wound. However, it must be taken into account that when using this technique, the sanitation of the purulent cavity itself is not carried out. this method makes it possible only to control the patency of the channels.

Currently, many authors consider laparoscopic sanitation of the abdominal cavity as an alternative to the method of programmed revisions and sanitation of the abdominal cavity [16].

At present, the experience of using endovideosurgery allows us to formulate general and local contraindications. A general contraindication should be recognized as a serious condition of the patient against the background of diseases of the cardiovascular, respiratory systems, liver and kidneys, accompanied by insufficiency of these organs. local contraindications are associated with the fact that so far the possibilities of endovideosurgery are limited in a number of diseases that have caused peritonitis, as well as in the implementation of a full sanitation of the abdominal cavity. These objectively existing restrictions must be determined before surgery and considered as contraindications.

Thus, each of the methods of prolonged sanitation of the abdominal cavity, having a number of advantages, at the same time has disadvantages. Optimally combining advantages and disadvantages is the method of repeated (programmed, staged) revisions and sanitation of the abdominal cavity, which effectively affects the intra-abdominal infectious process.

Videoendoscopic sanitation of the abdominal cavity in some cases can serve as an alternative to the method of programmed sanitation. However, the use of a minimally invasive technique is limited due to the technical impossibility of providing adequate sanitation in the most severe forms of intra-abdominal infection. The optimal choice by the surgeon of the method of prolonged sanitation is the key to successful treatment of widespread peritonitis [3].

In modern surgical practice, drainage, as an independent option for postoperative management of patients with peritonitis, is used for limited lesions of the abdominal cavity (no more than two anatomical regions). Indications for it are considered to be the presence of delimited purulent cavities, surgery on the extrahepatic bile ducts, uncertainty in the sutures after suturing gastroduodenal perforations or the appendix stump, ongoing capillary bleeding [14].

Despite the fact that there is sufficient evidence to discourage the use of prophylactic drains in various areas of abdominal surgery, there is little evidence for or against the use of drains in complicated forms of appendicitis, and all of them are quite old [27].



Score result The study of drainage in simple, uncomplicated forms of appendicitis was carried out in only two randomized clinical trials, the authors of which concluded that this is inappropriate [23, 28].

The fact has been established that drainage is much more effective for the evacuation of bile than feces or pus. Accordingly, it is correct to set up drainage if the surgeon is concerned about possible bile leakage, for example, if additional bile ducts are suspected in the area of the gallbladder bed. As a rule, there is almost no discharge along such drainage. In very rare cases, preventive drainage becomes therapeutic - with abundant and persistent bile leakage. In situations where the need for an already installed drain is questionable, it is very important to remove it as quickly as possible. The "dryness" of the drainage for 24 hours indicates that it has served its role [17].

The use of drainage in colorectal surgery has been the subject of debate for several decades. Prophylactic drainage of the abdominal cavity has become less popular in recent years due to the publication of a number of studies demonstrating that in the treatment of peritonitis, multiple drainage does not reduce the volume of accumulated fluid and the risk of abscess formation, nor does it improve postoperative results [25].

There are a number of publications in favor of the effectiveness of prophylactic drainage in rectal surgery. In particular, pelvic anastomosis has a high rate of anastomotic leakage when compared to colonic anastomosis [22]. A complete mesorectal resection usually leaves a large moist surface, which usually releases large amounts of serous and sometimes hemorrhagic fluid. Given that the pelvis is a fixed cavity, these anatomical limitations make fluid accumulation more likely. In this case, the installation of drainage can prevent the formation of abscess and peritonitis [20].

Summing up the analysis of the literature, I would like to note that the reliable functioning of the drains can be achieved only if they are constantly functioning, for example, as it happens with abdominal dialysis. Of course, this does not mean that it is necessary to abandon the use of drains in the treatment of peritonitis, but they should be installed according to strict indications [30].

Thus, despite the great accumulated experience, the question of the advisability of drainage of the abdominal cavity in peritonitis still remains open, since the improved methods of drainage currently used have a number of disadvantages, and the use of any method of treatment is often debatable. The development of new, highly effective methods of sanitation of the abdominal cavity in case of peritonitis is an urgent task, especially at the present stage of development of medical technologies.

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